Leveraging Technology Towards Digital Transformation

Selected e-Governance Initiatives - 2016

G P Sahu

K S Vijaya Sekhar

Prabhu Gollamudi

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About CSI

The seed for the Computer Society of India (CSI) was first sown in the year 1965 with a handful of IT enthusiasts who were a computer user group and felt the need to organize their activities. They also wanted to share their knowledge and exchange ideas on what they felt was a fast emerging sector. Today the CSI takes pride in being the largest and most professionally managed association of and for IT professionals in India. The purposes of the Society are scientific and educational directed towards the advancement of the theory and practice of computer science and IT. The organisation has grown to an enviable size of 1,00,000 strong members consisting of professionals with varied backgrounds including Software developers, Scientists, Academicians, Project Managers, CIO's , CTO's & IT vendors to just name a few. It has spread its branches all over the country. Currently having more than 500 student branches and rooted firmly at 73 different locations, CSI has plans of opening many more chapters & activity centers in smaller towns and cities of the country. The idea is to spread the knowledge, and provide opportunities to as many interested as possible.

For more information please visit www.csi-india.org

About Nihilent Technologies

Nihilent Technologies Limited is a global consulting and IT services solutions integration company using a holistic and systems approach to problem solving. Headquartered in Pune, India, Nihilent has experience in international consulting, IT outsourcing and IT services, and has helped more than 300 customers in more than thirty countries. Nihilent's operations span North America, Europe, Africa, Asia and Australia.

For more information please visit www.nihilent.com.

About Editors

Dr. G. P. Sahu is an Associate Professor, Motilal Nehru National Institute of Technology Allahabad, India. He has more than 18 years of teaching and research experience. He completed his one-year Post Doctoral Fellowship program from California State University Monterey Bay, California, US and Ph.D. in Management from Indian Institute of Technology Delhi, India. His research interests are in the areas of MIS, e-Governance and Green Information Systems. Dr. Sahu has published around 80 research papers in international journals and conferences. He has coordinated a few international conferences. He has also edited six books in the area of E-governance. Dr. Sahu has acted as a reviewer for international journals. He is also a Guest Editor with International Journal of Electronic Governance. Dr. Sahu has been on the jury for the CSI-Nihilent e-Governance National Awards, India. E-mail: gsahu@mnnit.ac.in

Dr. K. S. Vijaya Sekhar holds Ph.D. in Public Administration with specialization on Electronic Governance. His interest areas are Public Service Delivery using ICTs; Citizen Satisfaction towards ICT based services and eParticipation. He has over 20 research papers to his credit in International and National Conferences. He also Co-edited four books in the area of e-Governance. He is recipient of Best Paper Award for his research paper Measuring Sustainability in e-Governance Projects presented in 2nd International Conference on ICT for Rural Development held at Institute of Business Management and Rural Development (IBMRD), Ahmednagar during 1-3 November 2014.

He is currently with Research Center for e-Governance (RCeG) at IIIT, Hyderabad and has over 25 years of professional experience. He was earlier associated with Centre for Economic and Social Studies (CESS), Administrative Staff College of India (ASCI) and ICRISAT. He is Life member of Computer Society of India [CSI] and recipient of the coveted 'CSI National Service Award' for the year 2012 for his significant contribution to the e-Governance.

He has been associated with CSI-Nihilent e-Governance Awards (CNEA) since its very inception in the year 2003 and with CSI Special interest Group on e-Governance [CSI SIGeGOV] from the year 2007. He is also Joint Convener for CSI Nihilent e-Governance Awards (CNEA) 2014-16. E-mail: vijay@iiit.ac.in

Prabhu Gollamudi, has extensive experience in the IT Industry, working for most part of his career with the IT majors and closely worked on several e-governance projects, from concept to creation. He had also worked on system integration projects in the sectors of power, transport, banking, public administration and defence. During this journey, he had the opportunity to interact with several Government officials at various levels that enabled him to understand the Government processes for implementing e-Governance projects. His stint as Vice President (Business Development) in UK for an Indian major IT company provided exposure to business management and projects execution from a global perspective.

Post superannuation, he continued his professional work as Consultant for NISG, Hyderabad and later with Robert Bosch Engineering and Business Solutions Ltd, Bengaluru. Currently a freelance consultant and his interests include helping organizations in articulating processes for Government bids qualification, management and participation.

A key member of the Computer Society of India's Special Interest Group on e-Governance, he has supported many of its professional activities. Mr. Prabhu holds a Master's degree in Applied Mathematics from Government Engineering College, Jabalpur. E-mail gsnprabhu@yahoo.com

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Acknowledgements

This book "Leveraging Technology Towards Digital Transformation: Selected e-Governance initiatives in India 2016" indebts it's existence to the nominations from Government authorities of India and for their kind consensus in for publishing of abridged details of various successful e-Governance initiatives. Complimenting the CSI-Nihilent e-Governance awards series tradition, the main aim of this book is to present a compilation of initiatives that show case knowledge and awareness on projects to eGovernance practitioners, industry and researchers. We appreciate and acknowledge the contribution of bureaucrats, officials and staff for envisioning Information Technology as a means to achieve digital transformation and enabling us to bring forth this publication.

This florilegium is the collection of select nominations received for the CSI-Nihilent e-Governance Awards 2016. The initiatives described in this book reflect eGovernance initiatives carried out by Government departments/ institutions though ICT interventions by project owners.

This book also contains two invited articles and the editors are indebted to the authors for their contribution.

We are grateful to, Prof. Sanjiv Vaidya (IIM Kolkata), Prof. M. P. Gupta (IIT Delhi), Dr. Nityesh Bhatt (Nirma University, Ahmedabad), Prof. M. L. Saikumar, (Ex IPE, Hyderabad) and Dr. Saji Mathew (IIT Madras) from the Academia for their continued help in the nominations short listing process journey

Col Jagdish Jamwal, Shri Pradeep Tandon, Dr. C. V. Ramamohan, Wg. Cdr A. K. Srinivas and Shri Lakshman Roy Shastri provided an Industry perspective. We are grateful to them.

Shri Nagesh Shashtri (NIC), Dr. Piyush Gupta (NISG), and D. K. Dwivedi (Allahabad High Court), Ayaluri Sridevi (MCRHRD, Government of Telangana) brought a rich perspective to the assessment of the nominations with their experience and association with institutions connected with e-Governance practices & processes.

With, Shri Surendra Kapoor (Fellow, CSI & Convener, CSI-SIGeGov) and Prof. Harish P Iyer (Research Center for eGovernance, IIIT Hyderabad) active participation, the awards process gained significantly from their experiences and support.

It was a special privilege to have galaxy of previous and current Presidents of the Computer Society of India – Shri. Lalit Sawhney, Prof. P. Thirumurthy, Shri. Satish Babu, Shri. H. R. Mohan, Prof. Bipin V. Mehta, Dr. Anirban Basu and Shri. Sanjay Mohapatra CSI assisting us.

A special thanks to CSI Executive Committee, Nomination Committee, Regional Vice Presidents (RVPs), Division Chairpersons, CSI Chapter Chairs and Management Committee, Publication Committee who participated in various field visits across the

G. P. Sahu, K. S. Vijaya Sekhar and Prabhu Gollamudi
Editors

Foreword

President, CSI

I am happy to note the Special Interest Group on eGovernance, under the auspices of Computer Society of India has been successfully publishing an annual compendium show casing selected eGovernance initiatives. This year's edition of the CSI-Nihilent eGovernance Awards compendium titled "Leveraging Technology towards Digital Transformation – Selected eGovernance initiatives-2016" has a good collection of eGovernance initiatives reflecting the actions required towards our Digital India journey.

This year's theme reflects the role of technology in translating the vision of our Prime Minister Shri Narendra Modi's ambitious eGovernance initiatives and to transform India into digital empowered society and knowledge economy.

I am also pleased to know that some of the projects presented are award winners of this year's annual CSI Nihilent eGovernance Awards 2016, which is in the 14th year of it's journey with active sponsorship support of M/s Nihilent Technologies Limited. Needless, to say the trust, confidence and continued interest of nominees participating from various Institutions/Departments of State and central Governments in the CSI Nihilent eGovernance Awards journey is a reflection, of the quality of assessment and passion of the members in bringing the best of the projects from a knowledge perspective.

I wish to congratulate the sustained efforts of the team lead by Shri. Surendra Kapoor, Convener, CSI-SIGeGov and eGov Awards Convener's Team Shri. Gollamudi S. N. Prabhu and Dr. K. S. Vijaya Sekhar. Sustained leadership support from Maj Gen (Retd) Dr. R. K. Bagga and Dr. Ashok Agarwal and the support extended by Selection Committee Members, CSI Execom members, CSI Chapter Chairs and other Members, volunteers who assisted in the field visits in different parts of the country during this year's awards selection process is highly appreciative.

I take this opportunity to congratulate all the award winners of this year who deserve real applause on their initiatives in providing Citizen and various Government Services in a transparent & efficient way through the use of pervasive and emerging ICT technologies. I had the opportunity of witnessing the final presentations of a few state government initiatives during the final phase of the evaluation. The selection panel had a tough time in short listing the projects as each and every one of them was unique in nature and had something special to offer to its stake holders.

This year's compendium of award-winning projects, edited by Dr. G. P. Sahu, Dr. K. S. Vijaya Sekhar and Shri. Prabhu Gollamudi and brings a diverse set of eGovernance projects from practitioners around the country. I am sure this edition will serve as a useful reference source to trace the growth of eGovernance

in the country and benefit the stakeholders of eGovernance in the country: Governments, the technical & engineering community, policymakers & administrators, corporate and citizens -- the ultimate users.

Once again, my hearty congratulations to all the members of the CSI-SIGeGov team for their dedicated efforts in bringing out this volume.

Dr. Anirban Basu
President, CSI

Message

Vice Chairman and CEO, Nihilent Technologies Ltd.

Time to accelerate efforts to reap digital dividends

Is India on its way to being a digitally transformed economy? We may not have a straight answer to this question just yet, given that digital transformation is a continuously evolving phenomenon.

Digital technology has been spreading at an amazing rate through much of the world, India included. The availability of Internet has brought about a paradigm shift in the way people work, create and share information, socialize and organize the flow of ideas. New technological innovations like mobile based transaction platforms, cloud computing, data analytics and machine learning, Internet of Everything, social media have redefined work and governance. However, as the World Development Report released earlier this year by World Bank mentions, the need of the hour is for digital dividends – broader benefits accruing from these technologies - to spread through the world at the same rate as the spread of digital technologies. It is but essential for India, the largest exporter of IT services in the world, to introspect in the light of this report.

IT contributes to around 9.5% of India's total GDP and is the largest private sector employer. Having said that, the digital divide in our country is still wide. Mobile and broadband penetration can be much better. However, it is heartening to note that the Digital India initiative of our Government is taking steps in the right direction. The efforts to digitally transform the country can be seen in the three key elements of the Digital India program - Digital Infrastructure as a utility to every citizen, governance and services on demand, and digital empowerment of citizens.

Citizen participation plays an essential role in the digital transformation of a country, and in India, we can see steps being taken in this direction. The Aadhaar program, the JanDhanYojana and the Mobile drive for creating mobile IDs and mobile-based service delivery highlight the importance accorded to a very inclusive digital transformation exercise.

The CSI-Nihilent e-Governance Awards, now in its 14th successful year, has been rendering yeoman service towards making India a digitally transformed economy, by recognizing outstanding e-Governance initiatives in the country. The fact that with each passing year, the number of Expressions of Interest is increasing, it is a testimony to the growing stature of this exclusively merit based recognition program. It is a matter of pride for Nihilent to be associated with the Awards, right from inception. This reinforces our faith and belief in digital-based governance as the only alternative in providing Government-to-Citizen and

Government to Government services in the country. My hearty congratulations to the winners of this year's Awards.

One can see that digital transformation is more a philosophy than a project with a start and end date. It entails focused thought processes around the concept of digital, with unique perspectives. We have the wherewithal to lead the digital wave, and with a more unified approach between the Government and the citizens, a truly digitally transformed India is not long away.

L. C. Singh
Vice Chairman & CEO
Nihilent Technologies Limited

Message

Convener, CSI-SIGeGov

This year's compendium of selected e-Governance Initiatives 2016 aptly titled *"Leveraging Technology towards Digital Transformation" presents the journey of eGovernance practioners from State and Central government departments / Institutions, with their successful projects.* The compendium contains 50 Plus eGovernment initiatives, all of which are a sub set of nominations received for the now established CSI Nihilent e-Governance Awards 2016.

This is the 14th year of CSI-Nihilent e-Gov Awards (CNEA2016). In these 14 years, we have recognized over 300 Plus initiatives acrossIndia and have been publishing compendiums in similar way. As part of our knowledge sharing initiative and as a humble contribution to the e-Gov fraternity, we have ensured that this rich repository of e-Govbest practices is also available for reference from CSI SIG e-Governance portal: http://www.csi-sigegov.org

These are very important and interesting times for e-Gov 3.0. With much optimism around and the economy doing well on the back of such initiatives as *Make in India*, *Start-up India*etc,.Government 3.0 represents a new paradigm for governments to deliver public services in a creative manner by **opening** and **sharing** government-owned data to the public. At CSI-SIGeGov, we foresee that this will help establish a platform for participation enabling government departments and citizens to engage in constructive dialogs.

e-Gov moved from anachronistic Mainframe and workstation based solutions to more accessible m-Gov with Smart phones, Tabs and the Social Media. Representing and echoing this evolution and maturing of electronic services, many initiatives in this book report leveraging of state-of-the-art technology to provide services at the door step of Citizens and Businesses with increased communication and collaboration. We see this as the real Digital transformation – one which is characterised by Smart infrastructure supporting Smart Cities, and smart citizens with smart phones being served by SMART Governance.

As part of our journey, we have seen this digital transformation enabling larger participation of citizens / stake holders in availing and demanding more technology savvy services like for example the "m-Wallet" etc for the convenience of digitally enabled citizens. One of the desirable conditions for digital transformation is a digitally literate citizen. Though there are many initiatives in India which promote digital literacy, one that comes to my mind is a grass root level program conceived and implemented in several states of India - the National Digital Literacy Mission under the Digital India Program - A very commendable effort. There are many similar success stories in this book and I am sure you will benefit from our small, but sincere effort.

I wish to take this opportunity to thank all the nominees who participated in this year's nominations process and in some cases giving CSI-SIGeGov team an opportunity to assess at field level as part of our evaluation.

As CSI-SIGeGov Convener, I had the honour of having a most able team to manage the award process and edit this compendium. I congratulate and happy to appreciate the efforts of Mr. Gollamudi S. N. Prabhu, Dr. K. S. Vijaya Sekhar and Dr. G. P. Sahu.

As one reflects on the 14 years of CNEA journey, the names of two stalwarts - Dr Ashok Agarwal and Maj Gen (Retd.) Dr. R. K. Bagga – come foremost to mind. But for their support, guidance, and trouble shooting, we would not have been where we are CNEA is co-branded with Nihilent Technology, our partner since the inception of the award 14 years ago. We are grateful to Mr. L. C. Singh, Vice Chairman and CEO of Nihilent Technologies Ltd, for his unwavering support.

I also wish to thank Mr. Anirban Basu, President CSI and the team of CSI HQ for their support towards our activities.

We received over 180 nominations this year. With a stringent three-stage evaluation process to comply with, reviewing the initiatives was an intense and time bound exercise. The considerable amount of travel which the field visits entailed, added to the challenge. I must thank each and every member of our selection committee, other experts who supported, and the local CSI chapters for their involvement in the evaluation process during the last five months.

CSI SIG e-Gov Secretariat is located at IIITH. I wish to thank the Director of IIITH Dr. P. J. Narayanan, for giving us unfettered access to its infrastructure for furthering the cause of e-Governance.

CSI, a professional body of IT community, celebrated its golden Jubilee last year. As it continues to grow in stature, we take pride in being part of a vibrant community and for the opportunity to contribute to the cause of e-Gov through our various activities under the Special Interest Group (CSI SIG e-Gov).

Thank you and Jai Hind ...

Surendra Kapoor, CSI Fellow
Convener, CSI-SIGeGov

Preface

Digital epoch is exemplified by innovative know-how technologies that expands the wideness and broaden the knowledge revenue. Innovative technologies are rapidly taking over the entire industry and society, thereby creating a digital environment where all the daily economic-activities of customer as well as business are processing digitally. Digital Transformation is the rearrangement or speculation in technology, procedure or business framework to provide more effective and efficient services to citizens or customers. Digital Transformation is the change in state-of-mind and work-procedure. Digitization of the country drives new opportunities and empowers the government/citizen/organization to make more aware decision on a collective basis. Indian government sees the technology, procedure and characteristics as eventualities of a widened civilization revolution that enables government to function as an efficient, interconnected revolution engine. The government being in the pace with private sector leveraging technology (Information Technology) to provide their value added services to their citizens at their door step instantly on demand. Indian government is providing e-services and m-services through e-Governance and m-Governance respectively by greatly leveraging IT and decided to solve all their citizens' grievances within short span of time, as these services offers citizens to directly communicate government and Government-Citizens transactions. Simultaneously with providing the government services to citizens, government is sustain the environment by replacing the traditional paper-based workflow system with digital workflow system using various 'e' and 'm' applications for example e-Office, mSwasthya, MeeSeva etc.

e-Governance is an essential step taken by Indian Government years before to implement the idea of Digital Transformation. This initiative is being appreciated by societies and authorities over the years, as it is the initial and important tool which has connected the government with the citizens and makes the citizens aware about government services along with the environment concern. The program NeGP, launched in 2006, comprised of 27 Mission Mode Projects of Central and State, bridges the communication and knowledge gap among Governments, Industries and Citizens and resulted in a more effective and efficient government administration.

Through the years we have seen that while in the early stage of e-Governance initiatives implementation in the regions/states, the aim of the government has been only to gratify the citizens, but the aim includes leveraging technology for digital transformation and replace the traditional work structure. This indirectly includes Government Reengineering Process (GPR) and increasing efficiency of industry and government to gain the economical growth.

With the launch of "Digital India", "Make in India" and "Startup India initiatives, it is observed that various authorities, around the country, have implemented many e-Governance initiatives to achieve the target of delivering government services electronically and connect all citizens digitally to avail the services in

order to reduce the time and cost consumption in processing the services and transportation. This book includes details of select projects on e-governance initiatives related to Infrastructure, Scholarship, PDS, RTO, Supply Chain Management, Revenue and Tax collection, Election commission, women welfare, general administration, etc.

We have seen since last few decades that Government is working on citizen welfare and reducing its carbon footprints. With the usage of various e-governance applications like e-Scholarship, Sarathi, AAPURTI-UP, Hyderabad COP, INAM-Pro etc., the governments are delivering its services electronically. Digital modes (SMS, email, online portal) of filing applications, registration, complaints etc. and digital mode of redressing grievances have reduced the usage of paper, reduced transportation to achieve the green e-governance goal. In addition to this, mandatory practice of sharing of resources, virtualization of server and usage of green compliant IT products by various state authorities have managed to reduce their carbon footprints.

The methodology SIGeGov adopted to evaluate the e-Governance/m-governance projects implemented by various State Authorities comprises several steps. SIGeGOV invites nominees who have taken step to embark upon e-government implementation, digital divide etc. Then using the CNEA-value indicator the submitted hundreds of entries are evaluated to check the balance between technologies and values. It is quite likely that with respect to Government of India's program for Digital India too, SIGeGOV's suggestions of a policy based approach, and other value based approaches (e-participation, eDemocracy etc.) will prove to be the best approach.

One significant contribution of SIGeGOV has been towards bringing together e-Governance practioners share their project learnings thru the platform of CSI eGovernance awards and knowledge sharing summit/s. The reportier of intellect gathered by tracking directions, actions and initiatives and exchanged through such events and publications has helped bring focus to value creation and sustenance of projects for the benefit of stake holders. This annual compendium series – including the one aptly titled "Leveraging Technolgy towards Digital Transformation" – are arguably the best source of case studies for traversing the right path towards good governance.

G. P. Sahu, K. S. Vijaya Sekhar and Prabhu Gollamudi

CSI Special Interest Group on eGovernance
(CSI-SIGeGov)

Ashok Agarwal and R K Bagga

Introduction

Computer Society of India (CSI) has implemented the concept of "Special Interest Groups" to promote activities and research in major focused areas. Special Interest Group on e-Governance (SIGeGov) has been formed in Hyderabad during 2006 with support from CSI HQ and CSI Hyderabad Chapter. The basic objective has been to focus on an important area where Information Technology can be leveraged and bring likeminded professionals together to add value by bringing out recommendations relevant to various stakeholders. CSI is the only professional society covering individual users and citizens as members and is most appropriately suited to focus and add significant value to the successful implementation of e-Governance initiatives in our country. Because, e-Governance has the capacity to take our country to next generation as developed nation and mission of CSI-SIGeGov is to play an important role in that process.

Objectives

CSI-SIGeGov objectives include knowledge sharing with all stakeholders through holding conferences, Knowledge Sharing Summits (KSS) and recognizing e-Governance initiatives by giving CSI Nihilent eGovernance Awards (CNEA). CSI has instituted Nihilent e-Governance Awards and SIGeGov is expected to organize these awards and implement judging process; SIGeGov has Secretariat for e-Governance awards and maintain updated databases of all relevant stakeholders in this area; Support research in selected areas assessment framework and implementation strategy for e-Government projects; Participate in the processes for evolving standards in technology, processes and databases; Conduct of National and International conferences in e-Governance individually or by joining hands with other institutions; Interact with international bodies like IFIP and SEARCC to benefit India by sharing our experiences with other nations. With this context, the following activities were undertaken by CSI SIGeGov.

I. CSI Nihilent eGovernance Awards (www.csinihilent-egovernanceawards.org/) CSI-SIGeGov has instituted a series of awards by recognizing contributions made in the field of e-Governance in the country. This exercise is being sponsored by Nihilent Technologies Ltd., Pune. The awards are given for recognizing the efforts made in e-Governance area, specifically for States and Projects. There is an active participation for these awards from State and Central Government authorities and many Undertakings, research establishments. Participation by many of these Central and State level organizations have made these Awards an awaited event, every year since 2003. Concept of field visits and Analytical Hierarchy Process (AHP) was implemented to make the award process to government officials. Publishing the shortlisted nominations in the form of a book is another feature for wider circulation and knowledge sharing.

II. CSI-SIGeGov Knowledge Sharing Summits (www.csi-sigegov.org)

The National level e-Governance Knowledge Sharing Summit (KSS) is an annual event organized by CSI-SIGeGov in collaboration with respective States. The summit aims to provide a forum for policy makers, practitioners, industry leaders and academicians to deliberate, interact and develop an actionable strategy for transparent and good governance. To grow rapid and successfully, there is a need to respond proactively to the changing environment. This essentially calls for strengthening the capabilities, seizing and exploiting the opportunities. There is an inherent need to explore and share success stories, best practices and achievements spread across the country for better implementation of e-Governance initiatives. The KSS intends to provide a forum for discussion on e-Governance initiatives, implementation strategies and challenges and to share learning from national best case studies. SIGeGov organized a Knowledge Sharing Summit in the year 2009 (the first KSS) was held at Hyderabad with the support from Erstwhile Government of Andhra Pradesh. In 2010, the second summit was held in Bhopal with support from Government of Madhya Pradesh. In 2011, third summit was held in Gujarat with support from Government of Gujarat. As a special gesture - during KSS-2011 CSI conferred on Shri Narendra Modi, the then Chief Minister of Gujarat its first e-Ratna award recognizing unique leadership using ICT in the State of Gujarat for providing better citizen services over the years. In 2012, 4th KSS was held at Raipur with support from Government of Chattisgarh. Shri Raman Singh, Hon'ble Chief Minister was conferred as e-Ratna award for the year 2012. Then in 2013, 5th KSS was held at Visakhapatnam along with 48th CSI Annual Convention with Shri. J. Satyanarayana the then Secretary, IT was the Chief Guest for Awards ceremony. In 2014, the 6th KSS was supported by Government of Telangana and held in conjunction with 49th CSI Annual Convention at JNTU, Hyderabad. In 2015, the 7th KSS was held at Thiruvananthapuram with support from Kerala State IT Mission (KSITM), Government of Kerala.

III. Research Projects

The following are some of the important research activities with which CSI-SIGeGov has been associated in the recent times

a) Evaluation of eOffice Implementation in Ministry of Women and Child Development (MW&CD) in the year 2016.

b) A research study on "e-Governance in Kerala – G2C strategies for augmenting citizens experience" funded by the International Centre for Free and Open Source Software (ICFOSS), Government of Kerala and a report was submitted to the Government of Kerala.

c) The Research Center for e-Governance [RCeG] of IIIT-Hyderabad undertook a project for the development of advanced teaching case studies for use in e-Governance capacity building programs. Some of the senior members from SIGeGov participated in the project and helped ensure that the outcome was as desired by National e-Government Division [NeGD] of Government of India.

d) A special bonding exists between the Research Center for e-Governance [RCeG] of IIIT-Hyderabad and SIGeGov. It is expected that members of

SIGeGov will be involved in projects of national importance expected to be undertaken by RCeG during 2016-17 – projects such as study of technology trajectories related to the security of individuals and physical infrastructure in India, development of e-Governance systems dynamics models, conduct of advanced e-Governance capacity building programs etc.

IV. CSI Hyderabad Chapter (http://www.csihyderabad.org)

CSI was born in Hyderabad in 1965. CSI Hyderabad Chapter is one of the largest Chapters in India with many senior members and large number of student branches. It has been a vibrant chapter since the inception with many programs and conventions conducted on regular basis. The team at Hyderabad chapter has a blend of Members from Industry and Academia with a mission to bridge the gap. Hyderabad chapter is the only chapter in the country which has its own Social Networking website (http://www.csihyderabad.ning.com). CSI Hyderabad has tied-up with corporate organizations to provide in-depth training and executing live projects for students in the final year engineering colleges, as a part of their curriculum. The program starts off with an intensive training program that is customized based on live projects, covering programming languages, platform, database management, software development life cycle, project management, documentation, team work and soft skills etc.

V. CSI SIGeGov Publications

The following *Twelve* Books covering research case studies on eGovernance, were released during Annual Conventions of CSI and are available free to download at www.csi-sigegov.org/publications.php.

1. Leveraging Technology towards Digital Transformation. G. P. Sahu, K. S. Vijaya Sekhar and Gollamudi S. N. Prabhu (2016).
2. Digital India in Action - Selected e-Government initiatives in India. Ms. Ayaluri Sridevi and K. S. Vijaya Sekhar (2015).
3. Envisioning a Digital India: Selected e-Governance initiatives. Harish P Iyer, K. S. Vijaya Sekhar, Sridevi Ayaluri and Dr. Piyush Gupta. Religiate Interactive (2014).
4. Compendium of Selected e-Governance Initiatives in India. Harish P. Iyer, K. S. Vijaya Sekhar, Sridevi Ayaluri and Dr. Piyush Gupta. Virtual Reality Books (2013)
5. Inclusive Growth through e-Governance: Selected e-Governance Initiatives in India. Surendra Kapoor, Prabhu Gollamudi, Nityesh Bhatt and Harish P. Iyer. Universities Press (2012)
6. Widening e-Governance Canvas: Selected e-Governance Initiatives in India. Surendra Kapoor, G. S. N Prabhu and Niytesh Bhat. ICFAI University Press (2011)
7. Enablers of Change: Selected e-Governance Initiatives in India. Piyush Gupta, R. K. Bagga and Ayaluri Sridevi. ICFAI University Press (2010)
8. Fostering e-Governance: Compendium of Selected Indian Initiatives. Piyush Gupta, R K Bagga and Ayaluri Sridevi. ICFAI University Press (2009)

9. Transforming Government: e-Governance Initiatives in India. R. K. Bagga and Piyush Gupta. ICFAI University Press (2008)
10. Compendium of eGovernance Initiatives in India. R. K. Bagga and Piyush Gupta. University Press (2007)
11. eGovernance Case Studies. Ashok Agarwal. Universities Press (2006).
12. The State, IT and Development. R. K. Bagga, Kennith Keniston and Rohit Raj Mathur. SAGE (2005).

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Section – I

Invited Articles

Critical Success Factors for Green Information Systems: Adoption and Government's Perspective

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Abstract: *The paper intends to investigate the Critical Success Factors (CSFs) and to develop a model, for effective implementation of Green Information Systems in organizations. This paper enriches the existed literature on Green IS implementation by identifying the factors for adoption of Green IS in Indian organization. Nonetheless, there is limited research is available on Green IS adoption with special reference to Indian organizations. By addressing to this gap, the paper is based on i) in-depth literature review, ii) identification of nineteen CSFs to answer the question and implementation of Green IS, iii) Validation of CSFs through case studies of two Indian banks- State Banks of India (SBI) and Housing Development Finance Corporation Limited (HDFC), and finally iv) establishment of interrelationship among these factors and model development using Interpretive Structural Modeling and MICMAC analysis. The study concludes with managerial implication and conclusion. This study will contribute to the existing literature and assists researcher, expertise and policy makers in this area.*

Keywords: *Green Information Systems, Green IS adoption, CSFs, Green Banking, ISM, MICMAC analysis*

INTRODUCTION

Indian is marking its fifth position in the list of Greenhouse Gases (GHGs) emission, with contribution of approximate 6% according to the report released by European Commission and Netherlands Environmental Assessment Agency in 2014. Further, Indian ICT sector is solely responsible for 4% GHGs emission which is approximate 80 million tons of Carbon Dioxide (CO_2) emission per year. The e-waste production is exceeding amount of 80,000 tons per year (Wath et al., 2010) and alarming proportions in India. Considering all these issues awareness is budding in the Indian organizations for adopting sustainability, green technology and climate change (Gartner, 2014). In the Indian scenario it is required to reduce operational costs, stick to regulations and obligatory disclosures as well as to serve the demand from investors, patrons and associates to develop reports on the risks related to climate change, new openings and organizational climate policy efforts.

Green IS or Green computing/IT sustainability refers to the learning and practice of environmentally sustainable IS or computing. According to Molla (2008), Green IS comprises four key elements designing, manufacturing, using, and disposing of ICT/IT equipments efficiently and effectively with negligible or almost no effect on the environment. On the other side of coin, Green IS making the IT itself being green to support and control other ecological initiatives in order to gain efficient energy and reduce carbon footprint on each and every steps of life by providing innovative way outs. Further, Green IS initiatives create green awareness by assisting in building communities, engaging groups and supporting education and green advocacy campaigns.

In the current situation the environment, social and governance (ESG) areas, are moving towards beyond the CSR policies a benevolent activity and adopting Green Information Systems and sustainable practices to achieve their goal of environment sustainability. According to the Gartner Report (2014) Indian government is spending more than $34 billion on Green IS and sustainability initiatives. In the long run, organizational commitment and government regulations will drive adoption of green and sustainable technology and practices in India. But the major challenge facing by the Indian governments and organizations is not up-to-the-mark/failure in effective and efficient implementation of Green IS (Sahu and Singh, 2016). According to Sahu and Singh (2016), due to various barriers like lack of experts, lack of leaders, lack of infrastructures etc. it is required to identify the CSFs for effective and efficient Green IS implementation. From the extensive and systematic literature review it is observed that there is dearth of literature in this area. Therefore this study will offer extension of the study done by Sahu and Singh (2016) and enrich the existing literature review.

The objective of the paper is to identify the Critical Success Factors (CSFs) and to develop a model, for effective implementation of Green Information Systems in organizations with special reference to Indian organizations. The methodology adopted for the study comprises in-depth review and identification of nineteen CSFs for implementation of Green IS, followed by validation of CSFs through case studies of two different Indian banks- State Banks of India (SBI), public sector bank and Housing Development Finance Corporation Limited (HDFC), private sector bank. The next section describes the ISM framework and MICMAC analysis and developing of interrelationship among these factors and finally model development using these two tools. The study ends with managerial implication and conclusion. It is predicted that the result of this study will provide IT managers and experts with the knowledge and direction concerning the progress and implementation of Green IS initiatives in the organizations.

LITERATURE REVIEW

In last two decades, the enormity of environmental sustainability has increased researchers and practitioners' interest on Green IT and IS (Watson et al. 2010; Chen et al. 2008). Green Information System is defined as the information software that is helpful in managing and reducing overall GHGs emissions in the organization (Chen et al. 2009; Molla et al. 2009). Green IT referred as the efficient use of IT equipments in an energy efficient, effective and gainful manner (Dedrick 2010; Watson et al. 2010), in order to reduce the waste and pollution by changing blueprints of production and utilization (Molla et al. 2009; Boudreau et al. 2008).

Organizations adapting Green IS benefited by ISO 14001 and EMAS certification providing tangible and intangible benefits to organizations like reductions in incurred cost, penalties, e-waste production and GHGs emission, however, increment in savings; enhanced communication; well improved corporate reputation; and efficient operational processes (Zutshi & Sohal 2004; Daily & Huang 2001; Darnall et al. 2000).

Firms adapting ISO 140001 certifications or other eco-friendly practices certificate rewards in many ways such as: reductions in incurred cost, waste production and in GHGs emission increment in savings; enhanced communication; reduction in penalties; well improved corporate reputation; and improved operational processes (Chandrashekar et al., 1999; Dail and Hung, 2001; Darnall et al., 2000, González, 2005). Henningsson & Hedman (2016) found that Green IS is a bottom–up practice that attracts and make expert the individuals worried about environment, to investigate the problems and resolve it. Majority of the literature found on the antecedents of Green IS (Moola et al., 2009; Kuo and Dick, 2009) and its role in environment sustainability (Marguglio, 1991, Melville, 2010; Bose and Luo, 2011; Chen et al., 2013)

Sarkar & Young (2009) suggested effective cost model and awareness programmes as influencing factors for Green IT adoption, Schmidt et al. (2011) found corporate administration, ecological commitment and initiatives from IT workforce as the predictors of Green IS adoption. Butler (2011) found that institutional essentials persuade the acceptance and implementation of Green IS initiatives in organizations. González (2005) identified external factors (organization position, relations, policies) and internal factors (organizational strategy, technology and financial capacity) influencing adoption of clean technologies.

The benefits of Green IS, augmented public awareness of environmental issues and regulatory instructions forced the organizations to Go Green through implementing Green IS (Chen et al., 2009). Consequently Green IT/IS policy, design, and practice initiatives in recent times emerged into a vigorous research area in the Information System area. However, the existing literature represents a major gap of nonexistence research (Chen, 2008), conceptual and empirical both, that can aid organizations to build up strategy and framework to adopt and implement Green IS and practices. Also, limited literature on mandatory factors for successful implementation of Green IS creates a gap in available literature. Therefore, in this paper the focus is customized towards the practitioners of green IS and researchers in this area given the abovementioned primary necessity and urgency for Green IS successful implementations in organizations.

GOVERNMENT PERSPECTIVE AND CASE STUDIES

Various State Governments and Authorities at State/District level in India have taken steps towards Green Computing. They have started/implemented initiatives to reduce e-waste, to stop or reduce traditional paper-based work system in offices and to reduce physical movement/transportations. The Indian Government is fully committed and accountable to their environmental sustainable responsibilities. The Authorities at State/District level are pushing the departments to use Green star and TCO compliant IT equipments to increase the efficiency of available energy resources. Moving towards e-Governance the government departments are implementing e-Office, e-Taal, e-Nidhi, e-Scholarship, e-Revenue etc. In addition to these initiatives use of virtual servers and cloud computing technologies enabled the Government to achieve their goal of Green Information System implementation and save energy resources.

Indian government developed a nationalized mission of making Green India under the National Action Plan (NAP) on Climate Change in Ministry of Environment and Forests. Indian government is forcing manufactures and users of IT product to adhere with the WEEE and RoHS norms as well as National Green Tribunal Act 2010 regulation, in order to reduce the e-waste in the country. Through various motivational campaigns and strategies like shut-down the CPU when not in use, refurbish and recycling of IT products, comply with policies (CSR policies and Green ICT policies) etc. government has made number of public and private sector companies to adopt Green IS practices to reduce their carbon footprints and cost and increase their power efficiency.

Case 1: State Bank of India

The first largest and oldest bank of India, SBI, according to their Annual Report-2015, is practicing accountable banking to reduce its carbon footprints and to improve eco-sustainability through introducing Green initiatives and adopting the electronic mode of operations. SBI has been providing Green Channel Counters (GCC), financial support to construction of wind farms in India, Online banking, Solar ATMs, beginning of a pilot project to calculate the carbon footprint levels, funding to renewal energy projects. Currently SBI has more than 16,333 computerized branches and more than 22 millions net-banking users, since 2009-10 and faced various favored and unfavored factors or situations in implementation of Green IS. From the interview of IT experts and managers in the SBI Allahabad main branch it is observed that various factors like government policies, financial support, customers and employees' awareness towards degradation of environment, technological innovation, customer demand etc. are the factors encouraging the branch to adopt and effective implement Green initiatives. They are using old heritage building, in order to minimize the use of cooling systems, Kiosks, GCC for environment sustainability. However they are facing various problems like old aged customer's rigidness towards acceptance of new technologies, lack of trust in online services, threat of online theft etc.

Case 2: Housing Development Finance Corporation Limited (HDFC)

HDFC, the second largest private lender in asset volume is one of the dynamic bank in the field of environment sustainability, accountable for it's operations effects on environment, adopted various Green initiatives as an essential elements of its business practices to control GHG emission and reduce carbon footprint. HDFC is signatory to the Carbon Disclosure Project (CDP) and was amongst16 firms in India to achieve Carbon Disclosure Leadership Index (CDLI) score 17 in 2012. Interview of IT experts and policy makers at HDFC Allahabad branch it is explored that through multi-channel delivery and E-statement it has reduced the consumption of papers; using Energy-Efficient Lighting concepts HDFC have achieved 10% reduction in electricity consumption. Also, it has adopted the 'Phase-out' policy to change inefficient lighting options, green infrastructure concept for water management and energy savings. The employees promote and conduct green awareness campaigns in order to change the behavior and attitude of stakeholders towards environment sustainability. Similar to the SBI bank HDFC have explored several Green IS implementation influencing factors like leaders commitment, government policy, customers awareness and green services demand, cost-benefit analysis etc.

GREEN IS CRITICAL SUCCESS FACTORS

Through the extensive literature review and interview of policy makers and IT experts of SBI and HDFC banks, and academician in this area, nineteen CSFs for Green IS implementation are recognized and enlisted in below Table 1.

Table 1: Critical Success Factors for Green IS Implementation

S. No.	CSFs	Description
1	Leaders Obligation	Leaders support is important in espousing environment sustainability strategies
2	Environment Changes	Dynamic process of changing of organization environment in adapting new technologies.
3	Industry's Vision and Strategy	Firm's vision and plans to encourage employees and to give them a sense of purpose.
4	Resource Allocation	Allocation of resources (like money, technologies, personnel etc.) and their continuous availability.
5	Expert Selection	Appointment/Selection of individual/s enough to identify and seek to promote Green IS issues
6	Communication	Two-way communication between the organization and stakeholders.
7	Conflicts Resolution	Evade personality clashes and keep the egos behind
8	Standards Adoption	Standard guidelines and requirements like ISO 14001 standards adoption
9	Human Resource Induction and Training	Training of internal/ external stakeholders in order to trim down or eliminate their resistance and to develop awareness.
10	Efficient Organization Structure	Required IT equipments along with network infrastructure
11	Cost-Benefit Analysis	Incurred costs and benefits calculation resulting from Green IS adoption.
12	Inspection/Audits	Periodical audit/inspection for atmosphere review and expenses
13	Financial Support	Funds availability from organization and other financial institutions
14	Technological Advancement	Innovative technologies to meet environment and customers demand
15	Customer Demand	Customer demands for eco-friendly products and services
16	System Integration	The ability of integration of different organization functionalities.
17	Rivalry Pressure	Global rise of competition pushes industries to provide green products and services
18	Awareness	Organizations and understanding of Green IS as a means of reducing carbon footprints
19	Government Policies	Government laws, regulations and enforcement of penalties

Source: Sahu and Singh (2016)

It is observed from Table that these nineteen factors are critical factors for organizations for effective and smooth implementation of Green IS/initiatives. According to Sahu and Singh (2016), these identified factors are critical factors for smooth and effective implementation of Green IS in the organizations with special reference to government organizations in India. For the supporting study of these CSFs readers may refer Sahu and Singh (2016).

ISM METHODOLOGY AND MODEL DEVELOPMENT

According to Sage (1977), ISM modeling technique is an interactive learning process which helps to verify/establish interdependency and direction among the variables of a system. The model, adopted by different authors to construe the associations and trend amongst the known variables related to the problem as well as to build up a structured model for better understanding of interdependency (Gupta and Sahu, 2011; Brower and Chapple, 1995). The process consists several steps: 1) Identified Critical Success Factors/variables; 2) Developing Structural Self-Interaction Matrix (SSIM); 3) Using above SSIM table developed a Reachability matrix and to inspect that the resultant matrix is transitive or not (if factor 1 is related to factor 2 and factor 2 is related to factor 3 then, denotes that factors 1 and 3 are directly-indirectly related to each other according to ISM assumption (Table); 4) Further, development of Antecend Set and Intersection Set from SSIM, which to partition the Reachability matrix into different level (Table). Based on the results from step 4, a directed graph is drawn and finally converted into structured model after removing the transitive relationship (Refer Figure).

Table 2: Reachability Set and Levels of Factors

	Factors	Reachability Set	Antecend Set	Inter section Set	Level
1	Leaders Obligation	1,3,4,5,6,8,9, 10,11,14, 16,20	1,2,6,8,11,13, 14,15,17,18,19	1,6,8,11,14	VI
2	Environment Changes	1,2,4,6,7,9, 15,17	2,3,6,8,10,11,14, 15,17,18,19,20	2,6,15,17	VII
3	Industry's Vision and Strategy	2,3,4,5,6,8,9, 10, 12, 13,14,16,20	1,3,8,11,12,13,14, 15,17,18,19	3,8,12,13,14	VI
4	Resource Allocation	4,5,9,10,14,20	1,2,3,4,6,7,8,10,1 1,13,14,15,16, 17,18,19	4,10,14	II
5	Expert Selection	5,6,8,10,11,12, 14,16,18,20	1,3,4,5,6,8,9,10,1 2,13,14,15,17, 18,19	5,6,8,10,12, 14,18	VI
6	Communication	1,2,4,5,6,7,9, 10,11,14,16,20	1,2,3,5,6,8,9,10,1 2,15,16,17,18	1,2,5,6,9, 10,16	VI
7	Conflicts Resolution	4,7,9,10,12, 17,20	2,6,7,14,16,17	7,17	IV

	Factors	Reachability Set	Antecend Set	Inter section Set	Level
8	Standards Adoption	1,2,3,4,5,6,8,9, 10,12,14,16,20	1,3,5,8,11,13,14, 15,17,18,19	1,3,5,8,14	**VII**
9	Human Resource Induction & Training	5,6,9,10,13,20	1,2,3,4,6,7,8,9,10, 11,12,13,14, 15,16,17,18,19	6,9,10,13	**II**
10	Efficient Organization Structure	2,4,5,6,9,10, 11,12,14,15, 17,20	1,3,4,5,6,7,8,9,10, 11,13,16,18,19	4,5,6,9,10, 11	**VII**
11	Cost-Benefit Analysis	1,2,3,4,8,9,10, 11,13,14,16,20	1,5,6,10,11,12,13, 15,17,18,19	1,10,11,13	**VII**
12	Inspection/ Audits	3,5,6,9,11,12, 13,20	5,7,8,10,12,13, 17,18,19,20	5,12,13,20	**V**
13	Financial Support	1,3,4,5,8,9,10, 11,12,13,14, 16,20	3,9,11,12,13, 18,19	3,9,11,12,13	**VI**
14	Technological Advancement	1,2,3,4,5,7,8,9, 14,16,20	1,3,4,5,6,8,10, 11,13,14,15,16, 17,18,19	3,4,5,8,10, 14,16	**VII**
15	Customer Demand	1,2,3,4,5,6,8,9, 11,14,15,16, 17,20	2,10,15,18	2,15	**VIII**
16	System Integration	4,6,7,9,10,14, 16,20	1,3,5,6,8,11,13, 14,15,16,17,18, 19,20	6,14,16,20	**III**
17	Rivalry Pressure	1,2,3,4,5,6,7,8, 9,11,12,14,16,1 7,20	2,7,10,15,17,18	2,7,17	**VII**
18	Awareness	1,2,3,4,5,6,8,9, 10,11,12,13, 14,15,16,17, 18, 19,20	5,18,19	5,18,19	**X**
19	Government Policies	1,2,3,4,5,8,9, 10,11,12,13,14, 16,18,19,20	18,19	18,19	**IX**
20	Green IS implementation	20	1,3,4,5,6,7,8,9, 10,11,12,13,14, 15,16,17,18, 19, 20	20	**I**

Table represents that all nineteen factors, persuading implementation of Green IS into an organization, are categorized under ten levels from I to X. Green IS implementation is on level I and Awareness is on Level X. Table presents the Antecend of the factors and their Reachability to the other factors. A model is developed (refer Figure) from Table i.e. ISM model of CSFs for better understanding of interdependency on each other.

MICMAC ANALYSIS AND RESULT DISCUSSION

The above results gained by of ISM framework are inserted as an input to fuzzy MICMAC (Matriced' Impacts Croise´s Multiplication Applique´e a´ un Classement) analysis, in order to categorize and investigate the driving and dependencies power of CSFs of Green IS implementation. The MICMAC theory is based on product properties of matrices. The earlier identified CSFs are classified into four categories: 1) Autonomous, 2) Dependent, 3) Linkages and 4) Drivers. The MICMAC analysis gives Final Reachability Matrix (FRM) which provides the driving and dependence powers of the factors/variables. The driving power and dependence power of the factors calculated by summing up the entries of the possibilities of interactions in the rows and columns respectively. The result of MICMAC analysis and cluster of CSFs are presented in the Figure 2.
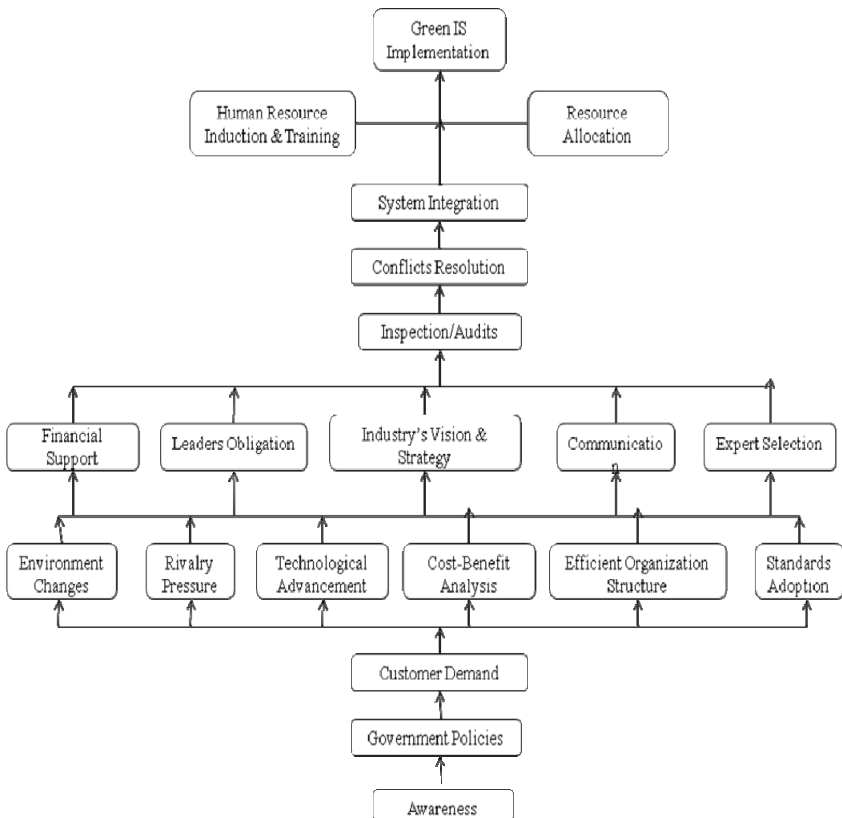
Figure 1: Green IS Adoption Model

Autonomous variables

This category represents those variables which are having weak driving power and weak dependence power. In other words they are poorly linked to other variables. Due their poor linkage, these variables are classified into "autonomous variables" category. It is observed that Confliction resolution; Audits and Funds Support are autonomous variables.

Dependence variables

This category represents those variables which are having high dependence power and weak driving power. The variables falling into this cluster represents "dependence variables." In our study we have found Green IS Implementation, Human Resource induction and training,   Resource allocation, Expert appointment and System Integration are dependence variables.

Linkage variables

This category represents those variables which are having moderate driving and moderate dependence power. The variables falling into this cluster represents "linkage variables." In our study we found Top Management obligation, Communication and Standards Adoption which falls into this category.

Driving variables

This category represents those variables which are having strong driving power and weak dependence power. The variables falling into this cluster represents "driving variables." In our study we found Awareness, Government Policies and Competitions pressure variables falling into dependence variables cluster.

CONCLUSION

The main objective of the paper is to identify the Critical Success Factors (CSFs) for Green Information System adoption with special reference Government organization. Through the case study of two nationalized banks SBI and HDFC the factors are validated and using ISM model in this paper structured model is developed representing the interrelationship between identified nineteen factors. Further in the study, factors are categorized under autonomous, dependence, linkage and driving variables using MICMAC analysis. This study will enrich existing literature and assists researchers and policy makers in this area.

It is expected that the result of this study will be helpful for IT managers and experts to increase their knowledge and will provide direction concerning the progress and implementation of Green IS initiatives in the organizations. This paper aimed at escalating the researchers, society, experts and policy makers green awareness and made an attempt to addressed the issues government organizations are facing during implementation of Green IS initiatives as well as this paper has provided factors/variable to be considered critically before adopting such strategies in the organizations. It is explored in this paper that adoption of new technologies, obligations and managerial competencies are the basic requirement for nurturing environmental sustainability.

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Imperatives of Public Procurement:
A Reality Check of Government e-Procurement Portals in India

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Abstract: *Studies highlight that public procurement in any country acts as a barometer of public confidence in fairness and transparency of public institutions. Available estimates indicate that India spends about 30% of its Union Budget on provisioning of goods / services (DIT, 2011). However, it is believed that in public spending in India is affected by corruption (ranked 76/168 on Corruption Perception Index; TI 2015) and lack of competitiveness (ranked 39/138 on Global Competitiveness Index; WEF, 2016). This negative perception does not augur well for the country's international obligations in meeting transparency requirements in public spending. This chapter reviews public procurement policies in India against this backdrop, with specific reference to the public procurement portals and their features. The research methodology followed included analysis based on an elaborate study of various international treatises, public procurement policies and portals in India. The study concludes that though National e-Government Plan has been initiated by Government of India and various policy guidelines also exist to facilitate e-Procurement, further measures are necessary to promote and successfully leverage existing e-Procurement portals. Finally, the chapter brings out few recommendations for ensuring that e-procurement initiatives bear intended result.*

INTRODUCTION

This article is divided in six sections. In section two, we review our obligations under various international treatises and conventions. The next section covers stipulations for public procurement in India from the point of view of constitutional and administrative provisions. Thereafter, we proceed to review public procurement portals and their enabling provisions. Finally before concluding, we present our analysis and few recommendations for making these public procurement portals more user-friendly and efficient.

INTERNATIONAL OBLIGATIONS

There are essentially three international frameworks which define obligations of member countries towards harmonisation of their domestic laws/ procedure with the stipulations contained therein. They are covered in succeeding paragraphs.

United Nations Convention Against Corruption (UNCAC)

UNCAC is the first legally-binding international anti-corruption convention adopted by United Nations. The convention has 71 Articles which are organised in 8 Chapters. The convention enjoins member states to implement anti-corruption measures that are aimed at preventing corruption, including domestic and foreign bribery, embezzlement, influence trading and money laundering. More specifically, the objective of UNCAC is to promote and strengthen:

- Measures to prevent and combat corruption more efficiently and effectively
- International cooperation and technical assistance in the prevention of and fight against corruption, including in asset recovery

- Integrity, accountability and proper management of public affairs and public property.

WTO Agreement on Government Procurement (GPA)

It is a pluri-lateral, voluntary WTO agreement that came into effect in 1981. It was then re-negotiated in parallel with the Uruguay Round in 1994 which became effective in 1 Jan 1996. GPA regulates government procurements (goods and services) by public authorities of the countries that have acceded to the agreement. The GPA is based on the principles of openness, transparency and non-discrimination. It also serves broader purposes of promoting good governance, the efficient and effective management of public resources, and the attainment of best value for money in public procurements. The agreement was again revised on 30 Mar 2012 which became effective from 6 Apr 2014.The revision brings about following significant improvements over the previous agreement:

- A revised and streamlined text with greater flexibility;
- New standards with regard to e-procurement tools;
- Improved provisions on special and differential treatment (i.e. transitional measures) for developing countries; and
- Expanded market access opportunities.

In addition, an e-GPA portal has been launched. This portal provides a single point access to various public procurements and policies of member countries. Presently, India has only observer status to GPA while China is negotiating its accession. Due to inherent benefits, there are deliberations in India about formally acceding to the agreement.

United Nations Commission on International Trade Law (UNCITRAL)

UNCITRAL was established by the UN General Assembly in 17 Dec 1966 through Resolution No. 2205 (XXI) for progressive harmonization and unification of international trade laws. The commission is working towards establishing legally binding obligations for fostering faster growth and creation of new opportunities by removing/ reducing legal obstacles to international trade through formulating modern, fair, and harmonized rules on commercial transactions. Few important UNCITRAL conventions could be categorised into:

Public Procurement and Infrastructure Development

- Legal Guide on Drawing up International Contracts for the Construction of Industrial Works (1988).
- Model Law on Procurement of Goods, Construction and Services (1994)
- Legislative Guide on Privately Financed Infrastructure Projects (2001) and Model Provisions (2003)

International Payments

- Model Law on International Credit Transfers (1992)
- United Nations Convention on Independent Guarantees and Stand-by Letters of Credit (1995)
- United Nations Convention on the Assignment of Receivables in International Trade (2001)

Electronic Commerce
- Model Law on Electronic Commerce (1996)
- Model Law on Electronic Signatures (2001)

Generally there is confusion in the environment between WTO GPA and UNCITRAL.UNCITRAL is a subsidiary body of the UNGA and its secretariat is based in International Trade Law Division of the Office of Legal Affairs of the United Nations Secretariat. On the other hand GPA is administered by WTO which is an intergovernmental organization independent from UN. Furthermore, the objectives and scope of WTO and UNCITRAL are different. While WTO deals with trade policies like trade liberalization, abolition of barriers, unfair trade practices, UNCITRAL on the other hand deals with laws applicable to member partiesun-connected with "state-to-state" issues such as anti-dumping, countervailing duties, or import quotas.

IMPERATIVES OF PUBLIC PROCUREMENT IN INDIA
Indian Constitution: Stipulations on Public Procurement
Indian constitution is generally silent on public procurement policies, principles or procedures, except for provisions incidental thereto:

Stipulations regarding Public Functions
Article 77 (1) stipulates that all executive action of the GoI shall be in name of the President. Similar provision in respect of Governor under Article 166 (1).Similarly, Article 300 (1) mandates that GoI may sue or be sued by the name of the UoI / name of the State.

Public Accounting
Article 150 empowers President of India to issue directions regarding the form in which accounts of the Union and of the States is to be kept. This is further augmented by Article 266which contains stipulations regarding consolidated funds and public accounts.

Commerce and Trading
Article 301 stipulates that subject to other provisions, trade, commerce and transit throughout India shall be free.This right of commerce is augmented and complemented by fundamental rights of the suppliers as a common citizen e.g. of being treated equally (while soliciting tenders). As regard public procurements, Article 298 covers authority to contract for goods and services. The contracts are legally binding on government and have to be executed in writing by specifically authorised officers as per provisions of Article 299.

Audit of Public Expenditure
Article 148 requires appointment of Comptroller and Auditor General (CAG) for audit of public expenditure. Article 149 lays down duties and powers of CAG. Article 151 requires President of India and Governors of States to place CAG audit reports before Parliament and state legislatures respectively.

Ancillary Statues: Stipulations on Public Procurement

Ancillary statues shape various aspects of public procurement, such as Indian Contract Act 1872, Sale of Goods Act 1930, CVC Act 2003, Competitions Act 2002, IT Act 2000, Prevention of Corruption Act 1988, Right to Information Act 2005, Arbitration and Conciliation Act 1996 etc. Further, expenditure from public exchequer is subject to statutory audit by C&AG (Comptroller and Auditor General's [Duties, Powers and Conditions of Service] Act 1971, Article 148 to 151).

Administrative Guidelines: Stipulations on Public Procurement

Rule 137 of General Financial Rules 2005, stipulates that every authority delegated with the financial powers of procuring goods in public interest shall have the responsibility and accountability to bring efficiency, economy, transparency in matters relating to public procurement and for fair and equitable treatment of suppliers and promotion of competition in public procurement. These guidelines are also covered in Manual on Policies and Procedure on Procurement of Goods, Services and Consultancy, issued by Ministry of Finance, Government of India.

Fundamental Principles of Public Procurement in India

Various constitutional, legal and policy guidelines on public procurement can be organised into few fundamental principles of public procurement, which all procuring authorities must abide by and be accountable for. These broad guidelines for public procurement in India is contained in Government Order issued by Ministry of Finance, Government of India vide OM No. 8 (3)-E.II (A) 0-02 &GFR Rule 137:-

- Maximizing economy, efficiency and effectiveness in procurement. This would mean purchasing of goods/ services of required specifications for the intended purpose in a required time frame at the most economical price.
- Fairness, i.e. providing fair and equitable treatment to all prospective suppliers / bidders.
- Competitions among suppliers for supply of goods/services to be procured so that efficiency can be rewarded and procurement can be made at the most economical price. This would entail giving wider online publicity through various procurement and department portals.
- Achieving transparency in the procedures relating to procurement.

E-PROCUREMENT INITIATIVES BY GOI

National e-Government Plan (NeGP) was launched by Government of India on 18 May 2006. E-Government Procurement is an Integrated Mission Mode Project (MMP). Vision of the MMP is to create a national initiative to implement procurement reforms, through the use of electronic Government procurement, so as to make public procurement in all Sectors more transparent and efficient. To foster implementation and use of e-procurement, in Jun 2010, GoI directed States/ Union Territories to implement e-Procurement either through:

- Use GePNIC.
- Use DGS&D e-Procurement Portal
- Use any other third party solution on PPP model.

For monitoring progress of migration/ adoption of E-GP, a committee was formed under Joint Secretary (Commerce), GoI. Central Public Procurement Portal was launched as a repository of all tenders floated in India. E-procurement has been made mandatory for all purchases above 10 lakh. Revision of Manuals on Policies and Procedures for Purchase of Goods, Works &Consultancy being undertaken by Procurement Policy Division, Ministry of Finance, GoI. In Jun 2016, alpha draft revised based on feedback/ comments from select stakeholders and domain experts. In Aug 2016, beta draft for Manual on Goods and Works has been put in public domain for comments. Now, beta draft of Manual of Policies and Procedures for Procurement of Consultancy and other services has been circulated for comments by 15 Nov 2016.

In addition, an 'Expenditure Management Commission' headed by Dr. BimalJalan was formed in Aug 2014. Meetings are regularly held and recommendations are disseminated by PPD.Many directions and policy guidelines have been issued:

- MDP on Public Procurement at NIFM. Project committees have been formed for changeover to E-GP w.e.f 01 Jul 2016.
- Procurement concepts like Value for Money, Life Cycle Costing etc., are being crystallized in Manuals. Financial capacity verification of vendor is now mandatory for placing of SO. Criteria of prior experience and turnover for bidding relaxed for startups.
- Inflation indexing of delegated powers and financial limits for procurements are being deliberated.

PROCUREMENT PORTALS IN INDIA
Govt E-Procurement Portals: DGS&D
DGS&D was established in 1951 for rendering procurement services to Central and State Governments by finalizing Rate Contracts for common user items and contracts against their ad-hoc demands. The contract is utilized by various ministries and their associated departments for affecting procurement under Rule 147 of GFR. DGS&D platform permits management of procurement requisitions, placement of supply orders and subsequent receipt and inspection. The payment to RC holder for supplies is made directly by the concerned ministries/ department. In the event of payment being made by DGS&D's on their behalf, the book adjustment is subsequently carried out with the concerned ministry. URL of the portal is http://www.dgsnd.gov.in/.

Government E-Procurement Portals: Central Public Procurement Portal
The website has been created and is being operated by National Information Corporation which is under Ministry of Commerce, GoI. The portal has two modules which provide different levels of functionalities i.e. E-Publish and E-Procure. The portal is a single point access public procurements being undertaken by various central govt organizations. The URL of the portal is http://eprocure.gov.in/. The portal also hosts the tenders published by states/ UTs (E-GP MMP).

Govt E-Procurement Portals: Government E-Marketplace (GeM)
Based on recommendations of Group of Secretaries made to Hon'ble Prime Minister, Government directed DGS&D to create a one stop Government e-Marketplace (GeM). It is meant to facilitate on line procurement of common use Goods & Services

required by various Government Departments / Organizations / PSUs. GeM (hosted by DGS&D) provides for e-bidding and reverse e-auction as well as demand aggregation. Rule 141-A inserted in GFR 2005. Enables spot purchase and payment uptoRs.50,000/-.The URL of the portal is https://gem.gov.in/. It is expected that once GeM stabilizes, DGS & D Rate Contracting role would be subsumed by it.

Government E-Procurement Portals: E-Auctioning

Using Internet technology to dispose of unserviceable/ discarded or surplus public goods which are no longer needed by various government departments. It is carried out through M/s MSTC, a Govt. of India enterprise. The entire process from the listing of goods for auction, reserve price to the actual auctioning can be carried out by various departments through MSTC web site http://www.mstcindia.co.in/. Vendors registered with M/s MSTC can participate in the online auction process.

ANALYSIS AND RECOMMENDATIONS

Analysis of above government e-procurement portals on the principles (international and Indian) of public procurements, indicates that they generally comply with them. The details are covered below:

Table 1: Analysis of e-Procurement Portals

Imperatives Portal	Maximizing Economy	Fairness	Competition	Transparency
dgsnd.gov.in	Yes	Yes	Yes. Only registered firms can participate in Rate Contracting process.	No. Details of orders placed through RC is not shared with public
eprocure.gov.in (E-Procure)	Yes	Yes	Yes. Only firms registered on site can participate.	Yes
gem.gov.in	Yes	Yes	Yes. Bidding only for procurements above Rs. 50,000/.	N/A. The portal is in evolution-nary phase.
mstcindia.co.in	Yes	Yes	Yes. Only firms registered on site can participate.	Yes

However, our analysis brings out following problems areas in the existing scheme of things:

- Portals restrict competition and maximisation of economy of procurement by restricting bidding process to the firms registered on these websites.
- The portals work in silos and exchange of procurement data, items on offer and vendor base is not shared among them. The portals are operated under the aegis of different ministries like Ministry of Finance, Ministry of Commerce and Industries and Ministry of Steel.
- For participating in the portals, a firm has to individually register on the portal which is inefficient and acts as an entry barrier.

- Non-sharing of procurement data across portals precludes MIS driven efficient and informed procurement decision by procurement agencies.
- The portals provide similar facilities like bidding, reverse auction etc. to the end users.

In view of the forgoing limitations, we recommend adoption of following measures for streamlining public procurement through procurement portals:

One-Function, One-Portal
It is imperative that existing public procurement portals are reviewed and one of the portals which provide similar functionalities e.g. CPPP and GeM be closed. This would eliminate redundancy in administering these portals by two different government entities and make procurement process unified to a single portal. Further, management of this unified portal be assigned to a single professional entity. Similarly, reverse auction function could either be amalgamated into this unified portal or assigned only to MSTC.

Centralised Registration of Vendors
There is need to institute centralised registration of vendors. While registering firms, their bank and taxation details and digital certificates etc., could be captured. This is necessary to exploit the provisions of GST provisions.

Sharing of Historical Data
In order to achieve value for money in public procurements, there is a need to make historical data available to the procuring agencies in easy to use MIS formats. For this a repository of data is to be created and data mining tools is to be employed.

Proactive Disclosure
It is suggested that post conclusion of contract/ placement of SO, the details related to procurement be automatically published on the e-government portals.

Horizontal Integration with Other Systems
In order to achieve efficiency in public procurements and plug regulatory gaps in taxation, there is a need to integrate these portals with banking, taxation and budget monitoring systems. ECS mode must be made mandatory for receiving payments from firms/ making payment to them for procured goods and services.

CONCLUDING REMARKS
Public procurement is important function of government in any country. Due to huge amount of expenditure incurred by government's world over, making procurement process efficient and transparent has huge benefits. International obligations require member countries to adopt best practices while undertaking public procurements. While in India, our procurement practices are one of the most transparent in the world (in theory), reported cases make one believe that these procedural safeguards could be flouted with impunity. GoI is conscious to the importance of perception management and is working towards making use of technology driven efficiency in public procurements. Towards this, a number of policy measures have been initiated and online procurement portals launched. After thorough analysis of these portals, we

recommend few changes for ensuing optimal utilisation of these government e-procurement portals.

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Section – II

State and Sustenance Initiatives

Nagaland State
Government of Nagaland

K. D. Vizo and Tongtiliba Longkumar

STATE SUMMARY

The Department of Information Technology & Communication (IT&C) is now playing a key role to transform the State of Nagaland into a modern State by way of improving transparency, efficiency and ensuring cost effective public service delivery to the citizens. The State is witnessing a paradigm shift in Governance and all other spheres of life and Information Technology and electronic media is enabling a knowledge–led economy. The world is now looking up to India to drive the global economic growth and India is looking towards east to open eastern corridors towards South East Asia to promote economic growth. The Department of IT&C is fully aware that it is the right time to take the State of Nagaland to the next higher level and make the State of Nagaland, "the land of e-Governance", through extensive use of e-Governance and ICT based technologies.

The State of Nagaland is now occupying a unique position in the IT core infrastructure development in North Eastern Region. Some of the landmark achievements are highlighted below:

- Nagaland is the first in India to take over State Portal and State Services Delivery Gateway (SP&SSDG) core infrastructure project.
- Nagaland is the only State in India where the State IT Department is running the State Data Centre without engaging private Data Centre Operator (DCO).
- Nagaland is the only State in India where the State is acting as Service Centre Agency(SCA) without engaging private companies for running Common Service Centre(CSC).
- Nagaland is the first State in North Eastern Region to start the pilot project for National Information Infrastructure (NII).
- Nagaland is the first State in North Eastern Region to introduce Aadhar based Biometric Attendance System in the State Civil Secretariat.
- Nagaland State e-Governance Society (NSeGS) which is functioning under the Department of IT&C has got ISO Certification and it is the first of its kind in Government offices in the State of Nagaland.

Following are the brief highlights of IT initiatives in the State of Nagaland

- The Nagaland State e-Governance Society (NSeGS) is carrying out most of the core infrastructure projects like State Wide Area Network (SWAN), State Data Centre (SDC), Common Service Centre (CSC), e-District Mission Mode Project and also State Portal and State Services Delivery Gateway Project (SP&SSDG). The State of Nagaland is having a record of completion of all the core infrastructure projects which were initiated by the Ministry of Electronics & Information Technology, Government of India, New Delhi. Now the National Information Infrastructure Project (NII) is under progress as the 1st pilot project in North Eastern Region and it is also being handled by the Nagaland State e-Governance Society (NSeGS).

- The State e-Mission Team (SeMT) consist of 4(four) members headed by Principal Consultant and under their guidance the Department of IT&C is taking various projects like Enterprise Architecture, Single Window e-Business, Wifi-Hotspot and eMobile Classroom.

- A special purpose vehicle in the form of CSC-SPV which is functioning under the Department of Electronics & IT, Government of India, New Delhi is actively extending support and guidance in rolling out various eServices through Common Service Centre. At present, 220 (two hundred and twenty) CSCs has been commissioned across the State and as on date 48 (forty eight) CSCs have already been provided financial inclusion facilities and efforts are underway to promote financial inclusion in other CSCs.

- Various District head quarters, Sub divisional head quarters and Block head quarters are already covered under the SWAN project as well as e-District projects and efforts are underway to cover all the villages with 2 mbps in Peren district where the pilot project of National Information Infrastructure (NII) is in good progress.

- The Nagaland State Wide Area Network which is the backbone network for data, voice and internet is providing connectivity (data, voice and video communications) throughout the State upto the Block Headquarters Level. Currently, 8mbps is provided upto District Head Quarter and 2 mbps is provided upto block head quarter.SWAN Third Party Audit (TPA) (M/s Price Water House Cooper) has successfully conducted periodical technical audit activities in various Points of Presence as per Service Level Agreement. After connecting various Administrative Headquarters, the Department is now in the process of connecting small offices in and around the Administrative Headquarters in the State for selected Departments.

- The Nagaland State Data Centre (NSDC) is providing various consolidated services, applications and infrastructures to facilitate provisioning of efficient electronic service delivery of Government to Government (G2G), Government to Citizen (G2C) and Government to Business (G2B) services.Finalisation of Request for Proposal for up gradation to Cloud enablement facility and shifting of Nagaland State Data Centre to new IT Complex building, Kohima has been completed. The State has taken a Cabinet decision to host all Government websites in Nagaland State Data Centre(copy of cabinet….)and migration of all Government Department's website to the State Data Centre is also completed. Since the termination of the Data Centre Operator on 23rd January 2015 due to non-performance, the State Data Centre is being operated and maintained by the local IT Technical Personnel of the Department which in itself is a unique arrangement in the Country. The Technical Team members who are handling Nagaland State Data Centre have been sent for various trainings which aims at establishing a strong and robust network and capable of providing secure and quality services.

- The System Integrator for eDistrict Mission Mode project has been selected through National e-Tendering process and the contract with System Integrator was executed on 3rd October 2015. Sensitization training for computerization of offices in the Districts, sub-divisions and administrative circle headquarters for various districts has been completed. The target set by the Department of Information Technology (DeitY), New Delhi was for rolling out 28 (twenty

eight) online eServices under e-District Mission Mode Project. As on date 30(thirty) online eServices has already been launched in the State of Nagaland. More online eServices are in pipeline and Bandwidth services like National Knowledge Network (NKN), SWAN Network and National Information Infrastructure (NII) will be extensively used for extending additional eServices.

- There are 220 (two hundred twenty) Common Service Centre (CSC) covering all 11(eleven) districts providing various services to citizens in accessing Government to Citizen (G2C), Business to Citizen (B2C) and Business to Business (B2B) services in remote areas. The Common Service Centre is providing various citizen centric services including DTH Recharge, Mobile Recharge and Top-ups, Post Paid and Data Card bill, Microsoft Digital Learning, Online Shopping, Surveys and Advertisement, Railways and Air Ticketing, Financial Inclusion Services, PAN Card, Aadhaar, Passport Application and Birth Death Registration, NPSC applications, Scholarship for Matric, Post Matric Scholarship etc. Kiosk Banking facility under Financial Inclusion (FI) service has been activated for 48 (forty eight) Common Service Centre in collaboration with State Bank of India (SBI), Bank of Baroda and Vijaya Bank. In view of the poor connectivity in remote locations, the Department had installed VSATs in various CSCs locations. The Village Level Entrepreneurs (VLE) were imparted training on operation and maintenance of CSCs and Financial Inclusion services in collaboration with State Bank of India.

- Nagaland is the first State in North Eastern Region to start the National Information Infrastructure (NII) Project in Peren District. In this project high speed internet connectivity is being provided to all the Administrative Headquarters and villages using SWAN, NKN and NOFN. In the State of Nagaland the NII Project is now being implemented in a very unique way by building separate backbone wireless network using unlicensed band. The pilot project is likely to be commissioned in about 1 (one) month time.

- The State of Nagaland had implemented online tax system with online payment facilities such as e-Services (VAT), e-Services (Pet/Amu), e-WayBill (Invc. Update), e-Registration, e-Payment, e-Challan, Transit Pass, Form & TIN Verification, Reconciliation, e-Road Permit.

- The Department of IT&C had extended technical assistance to the extent of finalizing tender and implementing the 181 Women Helpline call centre for the State Resource Centre for Women (SRCW) under the Department of Social Welfare.

- The Department of IT&C had assisted Nagaland Public Service Commission (NPSC) to make submission of application forms and payment of fees fully online for the 3rd consecutive years.

- All scholarships for students in the State of Nagaland have now been made online and students are getting their scholarship from their own personal bank account.

- The Department of IT&C had facilitated in bringing the 1st BPO with 400 seats capacity in the State Capital Kohima and it is likely to be commissioned in about 2(two) months time (photocopy enclosed).

- The Department of IT&C had empanelled 18(eighteen) IT firms and it is also facilitating e-Procurement and Tendering System in the State of Nagaland.

- The Department of IT&C is engaging consultants like PricewaterhouseCoopers, E&Y, Wipro, Delloite etc. for various projects and it is engaging private companies like Accenture, Terasoft, Infinity Infomatic etc for various IT infrastructure projects. Local entrepreneurs have also being engaged in small IT projects.
- The Department of IT&C had enabled 2(two) Public Grievance Redressal Sysem in the State Portal and e-District portal respectively. The Department is also coordinating with Railtel which is the executing agency of NOFN project under BBNL and Railtel has made good progress in NOFN project in the State.
- The State has recently conducted champions skill enhancement programme training for all North Eastern States and the National Institute of Smart Government (NISG) was instrumental in making it a grand success. Time to time various capacity building initiatives are being taken up to train Government officials, village level entrepreneurs etc.
- The Aadhar enrollment figure is high in the State and the State of Nagaland is the first in North Eastern Region to enable Aadhar based Biometric Attendance System in the State Secretariat.
- The Department of IT&C has issued guidelines Policy Guidelines for Condemnation & Disposal of IT Products/Equipment in February 2014 as part of e-Waste management and initiatives are being taken for energy saving and green computing.
- The State IT Department had got the approval of preparing DPR under World Bank Funding for Enterprise Architecture, Single Window e-Business and Wifi-Hotspot and on approval the final DPR, these 3(three) projects will be the first ever projects under International funding.
- The State of Nagaland is the first state in india to bring resource persons from eGovernace Academy, Estonia for eGovernance awareness programme and also for study of the existing IT infrastructure. The State is intending to engage System Integrator from Estonia for Enterprise Achitecture projet under World Bank funding.

The IT Policy 2004 of the State is now being revised and on approval of the State IT Policy 2016, the following broad features will be incorporated:
- To implement the National e-Governance Plan (NeGP) and Digital India Programme.
- To adopt the provision of all Government Services through Electronic mode within a fixed time frame by adopting the Electronic Delivery of Services (EDS), Rule 2013.
- To adopt the Citizen Engagement Framework of the Government of India for utilization of social media by the Government and its agencies.
- To mandate all Government Departments to migrate/create their web sites under the domain of the Government of Nagaland's official State Portal www.nagaland.gov.in.
- To ensure that all general circulars, notifications, Annual Administrative Reports, replies to Assembly questions, tender notices, examinations & recruitment notifications, selection results, various application forms etc. be published and updated on their respective websites regularly.

- To mandate all Government Departments to implement at least one citizen-centric IT enabled service within 1(one) year from the date of Notification of this Policy.
- To provide e-services through Common Service Centres and other Government authorised agencies.
- To ensure that all Departments follow the Guidelines, Procedures and Standards issued by the State Government and Government of India from time to time.

The Department of IT&C had also prepared the vision 2030 and the broad vision is as follows:

- To make Nagaland an Information Technology hub through setting up of world class Business Process Outsourcing (BPO) / Knowledge Process Outsourcing (KPO) for North Eastern Region and South East Asia.
- To provide High Internet Bandwidth to every Village Panchayat.
- To transform Nagaland into a digital society through transparency and accountability.
- To enable all Government Departments to have e-Office to deliver services promptly to citizens through online system.
- To bring about a comprehensive IT literacy initiative throughout the State.
- To generate direct and indirect employment for the unemployed youth through various IT related services.
- To promote knowledge economy and increase the GDP of the State through the use of Information Communications Technologies and IT services.
- To promote electronic financial transactions using virtual bank branches operating from Customer Activated Terminals, Smart Phones and other electronic accessories.
- To ensure cyber security, information security, prevention of data corruption and fraudulent practices.
- To promote Telemedicine, Telemarketing, and market supply chain through networking for retailers, distributors, warehouses, transporter, manufacturers, material suppliers etc.
- To ensure digitization of all records and promote use of demographic database for determining age and sex composition, income levels, distribution of resources, regional disparities, incidence of diseases, life expectancy etc.
- To train various Departments, Schools, Colleges, entrepreneurs and general citizens in IT related matters for improving their skills to meet the challenges of knowledge economy and promote economic growth.
- To make the State a major software exporter in South East Asian Region and make Nagaland one of the richest State in the Country.
- To promote high bandwidth data applications and electronic services to rural areas through Common Service Centres (CSC).
- To integrate all Government Departments on a single platform through enterprise architecture and enable modern electronic systems like e-Cabinet, e-Legal, e-Education, e-mobile classroom, e-Hospital, e-Dashboard, Single window e-Business, e-Naga Village etc.

- To strengthen core infrastructures like State Data Centre, State Wide Area Network, e-District, National Information Infrastructure(NII), Common Service Centres(CSC) etc.
- To strengthen networking infrastructure using terrestrial, wireless, aerial OFC and satellite technologies.
- To enable centralized electronic integrated security systems using electronic equipments such as electric field perimeter protection system, micro-wave co-axial cable system, vehicle identification system, biometric system, electronic scanner system, electronic explosive detection system, electronic jammers system, CCTV surveillance system with centralized common control, IP based surveillance system, advanced video analytic system etc.
- To bring up a world class e-Governance Academy in the State to cater to the needs of North Eastern States and South East Asian Countries.
- To encourage research related works in IT sector for the youth by bring up a robust Research and Development facility.

Value Proposition
In a way, it should cover:
- The State level e-Governance roadmap in terms of projects, initiatives, extent of coverage- functional as well as geographical, Capacity Building plans vs implementation, political or leadership support and use of ICTs in various Welfare Schemes and Development Programs;
- Highlights of other Flagship Programs and Aadhaar Integration status and it's outcomes (either in qualitative or quantitative form).
- International funded projects, Internal Budgets, Implementing Cloud/GIS/ Mobile based/Cyber Security/Social media technologies etc.,
- The outcomes / results can be provided either domain wise i.e., education, citizen services, transport, revenue or agriculture etc) or model wise (G2C/G2B/ G2G/G2E)Or, District-wise / region-wise / division-wise can be presented

Plan VS Performance (for the year Apr 2015 – Mar 2016)

Table: Plan vs Performance

Item	Planned	Actual
ICT Outlay (Rs. Crs)*	Rs. 20.46	Rs. 20.46
ICT Capacity Building (Rs. Crs)*	Rs. 0.81	Rs 0.72
SDC (Nos)	1 (one)	1 (one)
CSC (Nos)	220 (two hundred and twenty)	220 (two hundred and twenty)
ICT Projects (Nos)	10 (SDC, SWAN, SP&SSDG, CSC, e-District, NII, Online Inner Line Permit, Capacity Building, e-Mobile Class Room, Enterprise Architecture)	10 (SDC, SWAN, SP&SSDG, CSC, e-District, NII, Online Inner Line Permit, Capacity Building, e-Mobile Class Room, Enterprise Architecture)

RESULT INDICATORS

The Result Indicators are primarily the outcomes and key achievements for the State in the area of e-Governance during the year April 2015 to March 2016. This could be emphasized in terms of benefits to stake holders connected with say G2C, G2B, G2G services.

During 2015-16, the following 30(thirty) eServices under eDistrict MMP were rolled out and the target set by the Department of Electronics & IT, Government of India has been exceeded:

Table: eServices under eDistrict MMP

Department	Sl. No	eService Name	Department	Sl. No.	eService Name
Economics and Statistics	1	Issue of Birth Certificate	Social Welfare	16	Grant of handicap Pension
	2	Issue of Death Certificate		17	Grant of Widow Pension
District Administration	3	Backward Tribe Certificate		18	Handicap Scholarship
	4	Scheduled Tribe Certificate	District Administration	19	Sale Deed / Gift Deed
	5	Indigenous Inhabitant Certificate		20	Issue of Affidavits and Record Maintenance
	6	Permanent Resident Certificate		21	Issue of Dependency Certificate
	7	Domicile Certificate		22	Issue of Income Certificate
	8	Succession Certificate	Food and Civil Supplies	23	Issue of Ration Card under APL Category
State Information Commission	9	RTI Application		24	Issue of Ration Card under BPL Category
	10	RTI Appeals	District Administration	25	Renewal of Arms License
	11	RTI Complaints		26	Registration of Societies
Social Welfare	12	Grant of Old Age Pension		27	Issue of Citizen ID Card
Nagaland Board of School Education	13	Issue of Duplicate Certificate (X, XII)		28	Issue of Permits

Department	Sl. No	eService Name	Department	Sl. No.	eService Name
Food and Civil Supplies	14	Issue of Ration Card under Annapurna/AAY Category	Nagaland Public Service Commission	29	One Time Registration of Candidates
Labour& Employment	15	Registration in Employment Exchange		30	Application for Examination under NPSC

The following G2C, B2C and B2B are being offered through Common Service Centre in the State:

Table: Services offered by CSCs

Government to Citizen (G2C)	Business to Citizen (B2C)	Business to Business (B2B)
Birth & Death Registrations	DTH Recharges	Surveys
Nagaland Public Service Commission Applications	Mobile Recharges and top-ups	Advertisements
Scholarship Applications for Matric and Post Matric Students	Postpaid Mobile and Data Card bill payment	
Employment Exchange registration	Microsoft Digital Learning	
PAN Card Application	Online Shopping	
AADHAAR Card Application	Railways and Flight Ticketing	
India Passport Application	Financial Inclusion Services	

ENABLER INDICATORS

In all the case, the Department of IT&C conducts requirement study by engaging consultant while starting the project. After that the detailed project report (DPR) is being prepared and after approval of the DPR, the Request for Proposal (RFP) is floated inviting interested Implementing Agencies / System Integrators etc. Currently, the Department of IT&C is floating all the tender using eTendering system. In all the projects, standard third party audit is being engaged and STQC is conducted wherever required.

The above mentioned enablers are an effective tool that has placed the State of Nagaland well ahead of other North Eastern States in so far as Information Technology and eGovernance is concerned. In the forth coming projects, especially those which are earmarked for funding under World Bank, the same successful process will be followed.

Use of Social Media, Cloud computing, Mobile Technologies

Social Media is being extensively used in disseminating information to citizens. Currently, the popular social media in the State are facebook, whatsapp, twitter etc. The Department of IT&C also has an eSMS facility which is being extensively used by various State Government Departments and citizens. Social Media is also being used by State Police Department and other Departments to send information to citizens. The mobile phone penetration in the State is very high on all the applications which are now being brought up by the State IT Department are mobile based applications.

The State Data Center (SDC) which is being operated and maintained by the State itself without engaging the Data Centre Operator (DCO) is link to the National Cloud computing. The SDC is also having a robust disaster recovery system and by that way the requirement of a small state like Nagaland is being met by the existing cloud computing arrangement.

GREEN COMPUTING & E-WASTE MANAGEMENT

The Department of IT&C has issued guidelines Policy Guidelines for Condemnation & Disposal of IT Products/Equipment in February 2014 as part of e-Waste management and initiatives are being taken for energy saves and green computing. The main features of the e-Waste Management are as follows:

- ICT Products/Equipment are categorized as follows:
    - PCs
    - Laptops
    - Scanners
    - Data Communication Equipment
    - Package Software
    - Servers
    - Printers
    - UPSs
    - Dumb Terminals
- It is applicable to:
    - All Government Departments under Government of Nagaland
    - All Autonomous Bodies/Local Bodies under Government of Nagaland
    - All PSU's under Government of Nagaland
- The lCT Products/Equipment can be condemned on following grounds:
    - *Technically obsolete:-*
        - ✓ Completed 5 years life-span and not in working condition.
        - ✓ Completed 5 years life-span and technology outdated affecting performance and output that is expected out of it.
        - ✓ Package Software can only be condemned by declaring it as technically obsolete when no more updates or support are available from OEM.

Beyond Economical Repairs(BER)

ICT Products/Equipment can be declared BER when this Products/Equipment cannot be upgraded or maintained economically /warrant extensive repairs and replacement of sub-assemblies / accessories and the combined cost of which exceeds certain percentage (50%) of the current cost of an equivalent system. The same can be ascertained from the vendor who is giving Annual Maintenance Contract support.

Non-repairable

ICT Products/Equipment can be condemned due to non-availability of spare-parts.

Physically damaged

ICT Products/Equipment that has been damaged beyond repair due to fire or any other reason beyond human control can be condemned as Physically Damaged.

- The condemnation report so prepared by the department based on these guidelines is sent to I.T. Department/Standing Condemnation Committee (SCC)for approval. The condemnation is done only after approval is obtained from IT department.
- Based on the approval of Standing Condemnation Committee (SCC)on the disposal mode of Condemnation, the concerned Department is allowed to dispose it through Tender, Auction or Scrap depending on assessed residual value of the ICT Products/Equipment and as per the procedure laid down in General Finance Rules 2005 as given below:
- For the Products/Equipment with residual value above Rupees Two Lakh, the Department can dispose it through Advertised Tender or Public Auction.
- For Products/Equipment with residual value less than Rupees Two Lakh, the mode of disposal is determined by Departments Competent Authority, keeping in view the necessity to avoid accumulation of such Products/Equipment and consequential blockage of space and also the deterioration in value of Products/Equipment to be disposed of.

The processes followed for various mode of disposal are as follows:

Process of Disposal through Advertised Tender

The broad steps to be adopted for this purpose are as follows:

- Preparation of bidding documents.
- Invitation of tender for the condemned ICT
- Products/Equipment to be sold.
- Opening of bids.
- Analysis and evaluation of bids received.
- Selection of highest responsive bidder.
- Collection of sale value from the selected bidder.
- Issue of sale release order to the selected bidder.
- Release of the condemned ICT Products/Equipment that were sold to the selected bidder.
- Return of bid security to the unsuccessful bidders.

The important aspects to be kept in view while disposing the condemned ICT Products/Equipment through advertised tender are as under:

- The basic principle for sale of condemned ICT Products/Equipment through advertised tender is ensuring transparency, competition, fairness and elimination of discretion. Wide publicity should be ensured of the sale plan and the Condemned ICT Products/Equipment to be sold.
  All the required terms and conditions of sale are to be incorporated in the bidding document comprehensively in plain and simple language. Applicability of taxes, as relevant, should be clearly stated in the document.
- The bidding document should also indicate the location and present condition of the condemned ICT Products/Equipment to be sold so that the bidders can inspect the condemned ICT Products/Equipment before bidding.

- The bidders should be asked to furnish bid security along with their bids. The amount of bid security should ordinarily be ten per cent. of the assessed or reserved price of the condemned leT Products/Equipment. The exact bid security amount should be indicated in the bidding document.
- The bid of the highest acceptable responsive bidder should normally be accepted. There should normally be no post tender negotiations. If at all negotiations are warranted under exceptional circumstances, then it can be with HI (Highest tenderer) if required.
- In case the total quantity to be disposed of cannot be taken up by the highest acceptable bidder, the remaining quantity may be offered to the next higher bidder(s) at the price offered by the highest acceptable bidder.
- Full payment, i.e. the residual amount after adjusting the bid security should be obtained from the successful bidder before releasing the condemned ICT Products/Equipment.
- In case the selected bidder does not show interest in lifting the sold condemned ICT Products/Equipment, the bid security should be forfeited and other actions initiated including re-sale of the condemned ICT Products/Equipment in question at the risk and cost of the defaulter, after obtaining legal advice.

Process of disposal through Auction
- The Department may undertake auction of condemned ICT Products/Equipment to be disposed.
- The basic principles to be followed here are similar to those applicable for disposal through advertised tender so as to ensure transparency, competition, fairness and elimination of discretion. The auction plan including details of the condemned lCT Products/Equipment to be auctioned and their location, applicable terms and conditions of the sale etc. should be given wide publicity.
- While starting the auction process, the condition and location of the condemned lCT Products/Equipment to be auctioned, applicable terms and conditions of sale etc., should be announced again for the benefit of the assembled bidders.
- During the auction process, acceptance or rejection of a bid should be announced immediately. If a bid is accepted, earnest money (not less than twenty-five percent of the bid value) should immediately be taken on the spot from the successful bidder either in cash or in the form of Deposit-at-Call-Receipt (DACR), drawn in favor of the Department selling the condemned lCT Products/Equipment.
- The condemned lCT Products/Equipment should be handed over to the successful bidder only after receiving the balance payment.
- The composition of the auction team will be decided by the competent authority. The team should however include an Officer of the Internal Finance Wing of the Department.
- A sale account should be prepared for goods disposed of, in Annexure 1 duly signed by the Officials who supervised the sale or auction.

Process of disposal at Scrap value or by other modes
- If the Department is unable to sell condemned lCT products /Equipment in spite of its attempts through auction and advertised tender, it may dispose-off the

same at its scrap/depreciated value with the approval of the competent authority in consultation with Finance division. The Depreciation value of the ICT product/ Equipment on completion of 5 years may be calculated as given in the Annexure.

- In case the Department is unable to sell condemned ICT Products/Equipment even at its scrap value, it may adopt any other mode of disposal including destruction of the Products/Equipment in an eco-friendly manner so as to avoid any health hazard and / or environmental pollution and also the possibility of misuse of such Products/Equipment.

  If the items is still usable, it may also be consider for donation to State recognized service organisation /NGO.

Responsibilities of Department

- The competent authority should constitute a Departmental Condemnation Committee at Departmental level to declare ICT Products/Equipment as surplus or obsolete or unserviceable.
- Condemnation Committee of the department will prepare ICT Products/Equipment condemnation report which should be individually numbered having Products/Equipment description including Make, Model, Serial Number, Asset Register Number, Purchase Date, Purchase Price, Reason for Condemnation and additional information, if any.
- All procedure and rules of the Government on maintenance of records for condemnation of non-consumable items will be adhered to in these cases.
- The Condemnation report so prepared by Condemnation Committee of the Department will be reviewed and approved by Standing Condemnation Committee (SCC). The Condemnation will be done only after approval is obtained from Standing Condemnation Committee (SCC)/IT Department. To avoid piece-meal approach, all cases of a Department may be processed twice in a year during the months of May-June and Nov-Dec.
- The Department should appoint a Senior level Official to represent it in the Standing Condemnation Committee (SCC) of DlTC.
- The Department must ensure that all service and inventory labels including Data Operating System must be removed from condemned ICT Products/Equipment after taking proper backup.
- Once the ICT Products/Equipment has been condemned it should not be used for office use and subsequently should be kept in the area allocated for scrap within 1 week from the date of condemnation.

Responsibilities of Standing Condemnation Committee (SCC)

- DlTC will constitute a Standing Condemnation Committee (SCC) comprising of representatives from DolT, Finance Department and the concerned Department.
- The Standing Condemnation Committee (SCC) will review and approve the condemnation report prepared by Condemnation committee of concerned Department.
- The Standing Condemnation Committee (SCC) will also be responsible to decide on the mode of condemnation whether Buy-back or Disposal.

- The Standing Condemnation Committee (SCC) will record the proceedings in Annexure 3 which will serve as an approval for the concerned Department to condemn the ICT Products/Equipment mentioned therein.

NEW PROJECTS /INITIATIVES LAUNCHED DURING THE YEAR

The following new projects were launched during the year

- e-District Mission Mode Project where 30 eServices were made operational.
- Aadhar based Biometric Attendance System was launched in the State Secretariat making it the first of its kind in the North Eastern Region.
- Online Inner Line Permit application was made operational in the State.
- Disaster Recovery System for the State Data Centre was commissioned.
- 48 Common Service Centres (CSC) were introduced to financial inclusion system.
- All Government websites were migrated to the State Data Centre (SDC).
- The State of Nagaland is the first state in India to bring resource persons from eGovernance Academy, Estonia for eGovernance awareness programme and also for study of the existing IT infrastructure.

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Odisha State
Government of Odisha

Aditya Mohapatra

STATE SUMMARY
Use of ICT for better e-Governance across the state

- Created the right common IT infrastructures like Odisha State Wide Area Network (OSWAN), Odisha State Data Centre (OSDC), and Common Service Centre (CSC) etc. Now Initiating a messaging services in form of SSDG (State e-Governance Services Delivery Gateway) to provide seamless interoperability and exchange of data across multiple Government departments.

- Currently OSWAN is serving as the backbone network for data, video and voice communications throughout the state which includes 1 State Head Quarter (SHQ), 30 District Head Quarters (DHQ), 284 Block Head Quarters (BHQ).Another 800 Horizontal Offices are connected out of 1266 sites. The Odisha State Data Centre (OSDC) provides shared, secured and managed infrastructure for consolidating and securely hosting State level data and applications. Now Twenty-three software applications are running live in OSDC. Around 6600 Common Service Centres (CSCs) across the State was rolled outtill date to provide various citizens centric services at their door step. By these infrastructures, overall Government efficiencies haveimproved significantly.

- The Odisha State e-Governance Mission Team (SeMT) was formed in the year 2010 to support the Leadership and Apex Committee and function as the secretariat and full time internal advisory body in undertaking e-Governance projects in the state. This team is responsible for undertaking the groundwork for providing an overall direction, standardization and consistency through program management of the e-Governance initiatives in the state of Odisha. A team of ten professionals are working as part of State e-Governance Mission Team (SeMT) in Odisha.

- There are various Special Purpose Vehicle (SPV) like OeSL (Odisha e-Governance Services Ltd., CMGI (Center for Modernizing Government Initiative), OKCL (Odisha Knowledge Corporation Limited),etc. which are created in the state for supporting e-governance and other ICT initiatives.

- The Student Academic Management System (SAMS) an innovative initiation for e-Admission & post admission academic administration at Higher Secondary and Under Graduate Degree levels across all the colleges in the state was implemented to provide Citizen Centric, Transparent, Time saving & Economical platform of admission and academic administration which works on an online-offline mode.

- To increase the efficiency across the Administrative Structure, thereby improving the quality of services to citizens through a system of Information and Communication Technologies (ICT), e-Dharani, a comprehensive of computerization of all 316Registrar offices across the State was implemented in PPP Mode.

- Integrated Odisha Treasury Management Systems(iOTMS) was launched to improve the primary service delivery mechanism of the Treasuries which facilitates transparency between citizen and government, provides easier access

and usage of government information and services and enables faster decisions and actions by Government officials. Now an enhanced version of iOTMS called as Integrated Finance Management System (iFMS) is being implemented by Finance Department. The purpose of this system is to have a Centralized Core Treasury Management System in place in the State Finance Department.

- Value Added Tax Information System (VATIS) and e-Services Project for Commercial Tax Department, Odisha was implemented to achieve high efficiency in VAT Administration, online registration (e-registration), e-filing, electronic payment of commercial taxes (e-Payment), online return filing (e-Filing), requisition and utilization of Waybill (e-Waybill),issue of transit Pass (e-TP), reduction of interface between the dealers and the staff to avoid the perception of harassment.

- The e-District project as an MMP under NeGP was implemented in all districts of Odisha. Currently seven number of high volume citizen centric services, are being provided at the district level, by the District Administration to enable delivery of these services through the CSCs.

- The e-Municipality project was implemented in 44 urban local bodies of the state to ensure on line delivery of high volume citizen centric services provided by municipalities.

- The e-Procurement system was introduced in the state to bring more transparency and efficiency in tendering process.

- Transport department has implemented Vahan & Sarathi project for providing various citizen centric services like smart card based driving license, registration certificates, issue and renewal of driving license, registration of motor vehicles, issue and renewal of permits, e-payment of motor vehicle taxes etc. through use of Information and communication Technology.

- Steel & Mines Department of Odisha has implemented i3MS (Integrated Minerals and Mines Management System) which is a unique attempt to bring transparency to the Mining process. The overall objective of the project was to have an ERP system for Government where in all the Associated Government Departments /Agencies will have a single access to information pertaining to mining by usage of ICT.

The objectives, which are envisaged to be achieved through State ICT Policy, are as follows:

- To promote Odisha as an attractive investment destination for IT/ITES/ESDM companies by providing them with a congenial, industry friendly and proactive industrial climate and making infrastructure, supporting facilities and pool of trained manpower available for entrepreneurs at affordable cost.

- To create employment opportunities for the youth and to improve their employability through IT educational initiatives and industry focused curriculums to help them participate in the IT revolution, derive economic benefits and eventually become self reliant.

- To make Government more accessible to citizens and empowering them through enhanced access to information while improving governance through the use of IT and enhancing the quality of services to citizens.

- To promote new IT/ITES destinations across the state by providing assistance in setting up quality IT infrastructure including IT parks.

- To create world class ICT infrastructure for seamlessly connecting and integrating all ICT operators, Service Providers, Government, Regulators and end users.
- To create "Brand Odisha" for IT/ITES/ESDM Industries across the globe.

Special Focus Areas

Sectors / areas which are defined for active participation

- Start-ups and MSME Units
- Products and R&D/Innovation Firms
- Local/Women Enterprises
- Incubation Centres in Educational Institutions & Private sector
- Electronic System Design and Manufacturing (ESDM).
- Entertainment IT (Visual Effects, Animation, Gaming)
- Level II Cities/Level III Cities/Towns
- IT Parks/IT SEZs/IT Clusters
- Mega IT Projects
- IT Education

Incentives proposed under ICT Policy

- IT/ITES/ESDM Units declared as Public Utility Services.
- Exemption from routine inspection by regulatory Authorities of State & Central Government. Eligible for self-certification of the records, registers and electronic filing of all legal returns.
- Reimbursement of Sales Tax and VAT for a period of Five years.
- New MSMEs are exempted from payment of Entry Tax on purchase/receipt of raw materials for a period of five years from the date of Commercial Production.
- IT/ITES/ESDM Units are exempted from Electricity Duty.
- Units in IT Parks, STPI Complexes are provided with uninterrupted quality power.
- New units are entitled for interest subsidy @5% p.a. for five years from commercial production limited to maximum RS.10.00 lakhs on term loan.
- Energy tariff at industrial rate subject to approval of OERC.
- Stamp-duty exemption on land allotted by Government and Odisha Industrial Infrastructure Development Corporation.
- Attractive incentives up to 80% of rent on Incubation Space and up to 50% on lease rental.
- 20% investment subsidy on fixed capital with a maximum limit of RS.50 lakhs for IT/ITES and Rs. 5 crore for ESDM industry.
- Attractive recruitment assistance, patent assistance, Human Capital Investment Subsidy and specific incentives for IT Parks/STPs.
- Preferential Market Access (PMA) to local Enterprises participating in e-Governance projects of the State Government

The State of Odisha aspires to achieve following milestones by 2020 with effective implementation of this ICT Policy

- To attract 10 leading IT/ITES & 5 leading ESDM companies to the State.

- To achieve a gross ICT Turnover (including exports of software and IT Services, ESDM, Domestic consumption and Training) of USD 4 Billion (Rs. 24, 000 Crores)
- To achieve direct employment of 60,000 professionals in 800 IT/ITES/ESDM units.
- To create a built-up space of 60 lakh square feet and a developed land bank of 2000 acres for IT/ITES/ESDM sectors.

The Government aims to transform itself into e-Government and to become ideal state in the field of e- Governance by mandating appropriation of two per cent of plan budget for e-Governance initiatives and departmental modernization in all departments. The ICT Policy is envisaged to bring benefits by unleashing the power of ICT for the betterment of the common citizens through e-Governance, provide easy and comfortable access to information by public and attract private investments in the IT/ITES/ESDM sector. Now it has been fairly successful in delivering the desired results as major IT companies in the country namely Infosys, TCS, Wipro, Tech Mahindra and Mindtree have setup their establishments in the state. Also the Government priorities have been tuned to usher in development in the new environment.

Plan vs Performance (for the year Apl 2015 – Mar 2016)

Table: Plan vs Performance

Item	Planned	Actual*
ICT Outlay (Rs. Cr)*	175.38*	111.40
ICT Capacity Building (Rs. Cr)*	0.35	0.30
SDC (Nos)	1	1
CSC (Nos)	8558	6641
ICT Projects (Nos)	20	16

*NB: The figure mentioned is the budget allocated to Department of IT, Government of Odisha. But as per ICT Policy'2014, every department of Odisha will spend 2% of their Annual Plan Budget or 1% of their Overall Budget (whichever is higher) on various ICT projects which is approximately Rs. 800 Cr – Rs. 1000 Cr.

RESULT INDICATORS
Services:e-District MMP
Type: G2C
Stakeholder and their benefits
Citizens and different Government departments along with CSCsare the major stakeholders of the project. The Government support for making the process on line helped all parties to have a defined objective of these services.
Special note
Implemented to provide Citizen Centric, Transparent, Time saving & Economical platform of getting 7 different services through the e-district application. Improvement in transactions at CSC by providing government services to the citizens at their door steps.

Coverage

Went live in all districts of Odisha, so geographically entire state is covered through the same.

Services:Student Academic Management System (SAMS)

Type: G2C

Stakeholder and their benefits

An innovative initiation for e-Admission at Higher Secondary and Under Graduate Degree levels across all the colleges in the state by minimizing duplicity, paper work and physical document consolidation, This also increased the visibility of the aspirants and increasing their knowledge on availability of career options.

Special note

Implemented to provide Citizen Centric, Transparent, Time saving & Economical platform of admission which works on an online and offline mode.

Coverage

All Higher secondary and under graduate colleges of the entire state has been covered through the initiative.

Services:e-Despatch

Type: G2G& G2C

Stakeholder and their benefits

All Government Offices across the State, citizens, RTI Activist, Media along with CSCs are the major stakeholders of the project. The Objective of e-Despatch is to ensure instant communication of the Government letters without making any changes to the Government rules as laid down in the Records Manual. It reduces turnaround time from dispatch to delivery of Govt letters. Real time delivery of Govt letters at designation with acknowledgement. This brings transparency and accountability between citizens and government information and allows smart citizen search option in portal that aids citizens to access letters from various offices resulting voluntary discloser of Govt information.

Special note

All letters whether confidential or not have to follow the e-Despatch process. Though all letters may not be visible on the public domain, Government has notified that no postal letters will be sent for the communication made via e-Despatch.

Coverage

All departments of the state government of Odishahave been covered through the initiative.

Services:OSWAN

Regular video conferencing service through OSWAN allows officials from blocks, districts and state head quarter level to converse with each other at same time. OSDC is providing a shared, secured and managed infrastructure for consolidating and securely hosting many State level data and applications. It greatly improves time and cost efficiency in service delivery.

Type: G2G

Stakeholder and their benefits

Officials of various Government departments and district and block level administration are the major stakeholders of the project.

Special note
Implemented in the state
Coverage
This is available for state, district and block level.

Services: SMS
m-Governance application for collecting information regarding rice delivery by millers to rice receiving centres & FCI through SMS in the mobile.
Type: G2B
Stakeholder and their benefits
Transparent real-time information exchange minimizing data loss and time loss between the Government departments and the Rice Millers.
Special note
The choice of SMS based system increased usability of the system by the rice millers which also minimizes cost of the user hardware and training.
Coverage
Entire state warehouses in the state are under such initiative, so geographically the entire state is covered through the same.

Services: Collecting information regarding rice transfer in Rice Receiving Centres through SMS.
Type: G2G
Stakeholder and their benefits
Real time information exchange minimizing data loss and time loss between the Government department users, accurate information of the storage, usage and movement of the rice which was previously, majorly de-centralized have now been made available over a single click of a computer.
Special note
The choice of SMS based system increased usability of the system and also minimizes the cost of the user hardware and training.
Coverage
Entire state rice receiving centers in the state are under such initiative, so geographically the entire state is covered through the same.

ENABLER INDICATORS
Departmental Policy & Strategy
An ICT Policy, e-Governance roadmap along with vision, strategy and blueprint has already been embarked. Odisha considers its ICT readiness to a level where it can start redesigning the processes around the citizen as the major infrastructure backbone is already available and ready to deliver the solution through electronic mode.

Common Infrastructure
The successful implementation of Odisha State Wide Area Network (OSWAN), Odisha State Data Centre (OSDC) and Common Services Centre (CSC) provides a shared infrastructure for delivering various G2G and G2C services.

Process Re-engineering and reform

As the current focus of Government is for faster delivery of services to the citizens, a bold step has already been taken by passage of Right to Public Services Act, 2012 in the floor of the assembly. Also at epicentre of the power, the Odisha secretariat, Odisha Secretariat Workflow Automation System (OSWAS) as an important tool for electronic document management, note management to approval and file movement being implemented in all the departrnents of the State Government.

Capacity Building

Leadership meet program with the political leaders, STeP and eGPM Training for key government officials has already been conducted as the first step towards capacity building. Other training programs for general capacity building through imparting computer training are being offered across the state including employees of the Secretariat. The Officers/Employees of Government, Semi-Government Bodies, PSU etc serving in Grade A, B and C are given compulsory training by OKCL to have good knowledge on computer and all new recruits are also required to certify them with computer certification. Dedicated manpower resources for capacity building such as State e-Governance Mission Team(SeMT) are being placed and are being utilized to enhance the standard of training programme and overall capacity building. An amount of two crores was allocated by MeitY, GoI to accomplish these objectives.

Technology:

As per the MeitY, GoI guidelines and State Government eagerness, Open Standard solutions are being highly encouraged in the state of Odisha. Important applications like e-District and OSWAS are all developed in Open standards and also with open source tools partially.

Odisha state has a dedicated E&IT directorate, namely Odisha Computer Application Centre (OCAC) to oversee the operation (both technical & administration) of the state. The core infrastructures such as OSDC and OSWAN are operating in BOOT model and the disaster recovery site for OSDC is established at NIC, New Delhi.

USE OF SOCIAL MEDIA, CLOUD COMPUTING, MOBILE TECHNOLOGIES

Social Media

Government of Odisha is impressing upon to lay more emphasis on the social media and improve the quality of advertisements. Departments are taking specific measures to create their presence in Social media.

Cloud Computing:

Government of Odisha has initiated and completed the tendering process and awarded the cloud enablement at State Data Centre to Sify Technologies Limited. The cloud solution requirements would includes all necessary components / modules which are necessary to provide Infrastructure as a service to various line department within the state as a Private Clouds to start with and have the capability of moving gradually to other delivery modules like Platform as a service(PaaS)and software as a service(SaaS). The implementation is under process.

Mobile Technologies

Mobile Governance has a transformational capacity to the public sector not only by increasing access to existing services but also by enabling the design and delivery of new services. Government of Odisha has taken initiative for m-Governance implementation to realize the value of mobile technologies for responsive governance and measurable improvements to social and economic development, public service delivery, operational efficiencies and active citizen engagement. Accordingly five services from various state departments are identified & subsequently mobile application has been developed for those identified services as given below:

- Online Odisha Secretariat Pass (Home Department)
- Bus Timing Tracker (Dream Team Sahara of State Transport Authority)
- M-Way Bill (Commercial Department)
- Odisha water resource Application (Department of Water Resources)
- SAMS (e Admission of Higher education Department)

GREEN COMPUTING & E-WASTE MANAGEMENT

Green Computing

For promoting green governance at the state level the following action points are identified and being implemented.

- Awards are to be instituted for demonstrated, efficient natural resource management by IT units.
- The development of comprehensive e-waste collection and recycling systems and their use by State as well as private agencies for the disposal of IT products is being promoted.
- While procuring IT products, Government will give preference to firms that have an expressed end-of-life product take back policy and e-waste recycling processes.
- Government Departments and agencies is giving preference to 'green' and energy efficient IT products in their procurement.
- In consultation with the Environment Department and with the approval of the Empowered Committee, norms will be determined to facilitate 'green' IT Parks as well as the units in such parks to obtain consent relating to environment and other benefits.

e-Waste Management

The notification for disposal of e-waste from government offices are already being issued in Odisha which states that e-Waste so generated should be offered to the collection centres authorized by the State Pollution Control Board, registered Dismantler and Recycler or pick up and take-back service provider by the producer. If there is more than one authorized collection centre or registered Dismantler and Recycler, then the e-Waste is to be offered to the collection center or registered Dismantler and Recycler who offers the highest premium for taking the e-Waste.

Various meetings were convened to deliberate and emphasize on effective implementation of the provisions of e-Waste (Management and Handling) Rules'2011.The State Government is impressing upon the producers of electrical and

electronics equipments companies for strict compliance to the IPR as per provisions of e-waste policy'2011.

NEW PROJECTS /INITIATIVES LAUNCHED DURING THE YEAR

- Well-known telecom engineer and inventor Dr Sam Pitroda has been appointed Technical Advisor to the Odisha Government. Dr Pitroda will help provide the essential technological blueprint to write the IT story of Odisha and will have a key role in Vision 2036 of the state.
- Bhubaneswar leads Government of India's Smart City list and an estimated amount of Rs 50,802 crore to be invested over five years.
- The Government has initiated steps to prepare the telecom policy to provide facilitative support to the telecom industry with the objectives of boosting up telecom infrastructure and connectivity.
- For countering cyber attacks and cyber terrorism, Odisha Government has formulated a 'Crisis Management Plan for Cyber Security in Odisha -2016' that outlines a framework for dealing with cyber related incidents.
- The eBiz portal covering 14 G2B services with a common application form and an integrated payment gateway was launched at Odisha Investors' meet in Mumbai as a part of the Make in India week.
- The Government has formulated the policy on Guidelines for website and portal development, hosting and maintenance in the year 2016.
- The Odisha Government has asked all district collectors to organise special Aadhaar enrolment camps at Gram Panchayats and urban local bodies to achieve 100 percent Aadhaar enrollment by October this year.
- Empanelment of Consultants& TPA for all departments of Odisha has been done for utilization of 2% budget on e-Governance and ICT Initiatives.
- The State is taking steps to set up and operationalise six more STPIs apart from existing four STPIs in the next two years.
- The State is planning for setting up an Electronics Manufacturing Cluster (EMC) in Bhubaneswar with an initial investment of Rs 209 Cr.
- Bhubaneswar and few important cities of the State will have the facility of WiFi in coming year.
- E&IT Department would bring out a Rural BPO Scheme to create at least 5000 - 10000 seats in all the STPI locations of the State to provide employment opportunity to the youth of the State close to their home towns.
- The Government is in the process of setting up of another Indian Institute of Information Technology in PPP mode and an Electronics & ICT Academy in IIT, Bhubaneswar in the year.
- E&IT Department is in the process of establishing an ESDM Incubation Centre in association with STPI in Bhubaneswar.
- In order to promote employment among the youths in IT and ESDM sectors, Finishing Schools are being set up by E&IT Department in association with ET&ET Department, leading industries associations and academy.
- E&IT Department would expand the existing Data Centre and set up a common Data Centre for all Govt Dept., PSUs and Autonomous bodies with Cloud enablement.

- The State is coming up with an IT Procurement Procedure for IT related procurement across the departments of Government of Odisha.
- All the social benefit schemes of state of Odisha are being integrated with UIDAI State Resident Data Hub (SRDH) in order to bring transparency in the system and to avoid ghost beneficiaries.

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Rajasthan State
Government of Rajasthan

Ashutosh M. Deshpande

STATE SUMMARY

We, with the vision of Good Governance - "SuRaaj", are highly committed to provide efficient, reliable and transparent government to residents and industry sector in Rajasthan. Rajasthan is aggressively moving on the path of being the IT Hub of India – ensuring an environment which is dynamic, supportive and reliable for development of IT as a sector. Information and communication technology (ICT) has profoundly changed almost all aspects of society. It is now central to how people communicate, interact, make decisions and do business. This includes the way governments operate and deliver services. When service delivery now becoming a priority for states across India, Rajasthan is already a ground breaker ensuring service delivery with more than 35000 nodes of eMitra, extending the reach of Government till practically every doorstep of Rajasthan. With over 3 Crore enrolments and more than 1 Crore transactions already held, Bhamashah Yojana has brought Rajasthan to the forefront of Financial Inclusion and Women Empowerment, leveraging ICT to its best for centralized direct benefits transfer and centralized resident data hub. Rajasthan has shown and ensured - that the dream of financial inclusion envisioned by Hon'ble Prime Minister Narendra Modi Ji is implemented to its best. We have the best in class infrastructure for video conferencing till every PanchayatSamiti in Rajasthan, making us a pioneer in this field as well and ensuring that reaching out to the Government is free from Geographical boundaries and distances. Rajasthan Sampark has proved to be a trailblazer in the field of end to end monitoring and grievance redressal for each resident, ensuring time-bound and effective service from the government to everyone. Initiatives like RajNET, RajSWAN, Raj SewaDwaar and RSDC have ensured creating a strong IT backbone of Rajasthan. Raj Dharaa has ensured making us the first state to have its own integrated GIS platform – ensuring a highly futuristic Decision Support System for state. With Raj eVault, Raj eSign, iFacts, Raj eOffice, Single Sign On, eSanchaar and many more, Rajasthan has proved to be a trendsetter clearing our intentions to be the next hub of Information Technology in India. We are moving aggressively towards making Rajasthan the dream destination of IT investment and promotion in India and SAARC.

Few Important Glimpses
Only state with
- fully implemented Service Oriented Architecture and eGov Framework
- integrated Resident Data Hub and DBT Engine
- fully implemented ePDS system with more than 300000 transactions per day through more than 26000 ration shops
- integrated and centralized, fully implemented health insurance scheme – Bhamashah
- integrated sector portals for ease of access
- integrated communication platform covering email, SMS, IVRS, GIS – eSanchaar and iFacts
- implemented Video Conferencing facility till GP level

- intelligent Service Delivery Gateway, with more than 500000 transactions per day – Raj SewaDwaar
- implemented Single Sign On for all applications
- Geo Spatial Data Infrastructure and GIS based Decision Support System
- Service integrated Raj eVault complementing Digital Locker, with more than 2 Crore active account for all residents
- implemented in house eSignature system
- State master centralized data hub
- in house mobile app development center with more than 28 running apps
- implemented NOFN pilot
- complete local language support for all applications

Deployment plan v/s Utilization of SeMT and SPV in Rajasthan

With a total strength of 13 members, SeMT objectives are well defined in Rajasthan – which are as follows:

- Undertake computerization till the last mile offices to ensure electronic delivery of high volume citizen centric services at the district level.
- Efficient delivery of services with improved service levels by undertaking extensive Business Process Re-engineering (BPR) of identified services.
- Extensive capacity building and training of field level functionaries to ensure smooth migration to electronic delivery of e-district services and phasing out manual delivery of services.
- Delivery of services through eMitra/CSCs by leveraging the common infrastructure of RajNET, SWAN, SDC, and Rajasthan Service Delivery Gateway Raj SewaDwaar.
- Development of applications to be hosted at the SDCs for delivery of services.
- Delivery of all public services at district/ sub district level in electronic form through state portals by using the Rajasthan Service Delivery Gateway Raj SewaDwaar.
- Providing easy, anywhere and anytime access to government services (both information & transactional) to ensure reliability, efficiency, transparency and accountability.
- Reducing number of visits of citizens to a government office / department for availing the services and thereby eliminating harassment.
- Reducing administrative burden and service fulfillment time and costs for the government, citizens & businesses.
- Reducing direct interaction of citizen with the government and encourage 'e'-interaction and efficient communication through portal.
- Enhancing perception & image of the Government and its constituent Departments.

In addition, it is an innovation in itself that for any ICT project over the value of INR 25 Lacs to be implemented in Rajasthan, an approval from the State eGovernance Mission Team under the chairmanship of Secretary, IT&C is required. The current strength of SeMT in Rajasthan from NISG/NeGD is 8 members who are fully utilized with multiple state/central projects. The SeMT has also been provided with State IT designations, ensuring better coordination with state officials.

Awareness and Communication - Status
- State level agencies in place for Awareness and Communication
- 10,000+ activities done in past 6 months
- Awareness through video walls, vans, IVR, SMS, email implemented
- Social Media Unit in place
- Communication and Placement Unit in place
- Every project has mandatory Awareness and Communication

Integration with District, Panchayat, Municipalities and Blocks
- Connectivity upto 1 mbps already provided till GP level
- More than 35000 Service Delivery centers across the state
- The entire infrastructure as well as platforms till are integrated the village level, with complete backend automation

Integrated Grievance Redressal
Only state with integrated grievance redressal platform, with call centre, SMS, email, IVRS and app based mechanism available providing time bound redressal

Status of SWAN
SWAN in Rajasthan is integrated with RajNET, mandated to provide connectivity till GP level in the state.
- Vertical Segment – 273 POPs
- Horizontal Segment – 4363 Offices

AADHAAR Integration
All applications, including SSO, are AADHAAR enabled, and it is ensured that the user is duly incentivized if AADHAAR is used by her/him for a service.

Status of RSDC
- Established in 2002, first Government Data Centre in the country
- More than 500 websites/portals/applications hosted
- More than 500000 transactions on daily basis
- More than 3000 sqft in area, 43 Racks, 200+ servers, 1 gbps connectivity, 700 TB SAN
- Expanded to a large scale with State of the art international standards and technology
- One of the only Green and Eco Sensitive Government Data Centres in India, getting mapped with Tier 4 Standards

Status of eDistrict/eMitra/CSC
- More than 35000 centres
- First state to be VGF free, all centers self sustainable
- More than 290 services
- More than 300000 transactions per day

Rajasthan eGovernance and IT/ITeS Policy 2015

The vision of Rajasthan eGovernance and IT/ITeS Policy 2015 is to achieve Good Governance and facilitate inclusive growth, harnessing ICT and evolving eGovernance with improvement in delivery of services, bridging the digital divide and evolving Digital Rajasthan. We are creating IT standards and benchmarks on three pillars – Confidentiality, Integrity and Availability. Rajasthan takes a holistic view of eGovernance initiatives across the state and departments, integrating them into a collective vision and a shared cause. Around this idea, a magnanimous state wide infrastructure reaching down to the remotest of villages is evolving, and large-scale eGovernance initiatives are taking place to enable easy, reliable access of people to the Government the eWay.

Mission

- Establishing complete participatory & transparent open Governance and Citizen Centric IT and e-Governance for the residents of Rajasthan
- Branding Rajasthan on the IT Landscape
  - Establishing 7 Smart Cities in Rajasthan by 2020
  - Positioning Rajasthan as Best IT Investment Destination
  - Positioning and Branding Jaipur as IT, ITeS and R&D Hub in North and West India
- Improvement in the environment for IT Industry in Rajasthan.
- Boosting adoption of Information Technology to bridge the digital divide and creating knowledge based society in Rajasthan.
- Tapping the growth potential of Electronics System Design & Manufacturing industry to the optimum.

Objectives

- Implementation of Rajasthan IT Incubation Plan with establishment of Rajasthan Skills Registry and achievement of up to 10,00,000 direct employable professionals in the ICT sector by 2020.
- Development of at least 3,000 technology start-ups in the state by 2020 and establishment of Rajasthan Venture Capital Fund with specific capital for development of IT/ITeS/ESDM start-ups in Rajasthan.
- Increase in the current investment in IT/ITeS sector by 10 times
- Increase in the IT turnover to INR 80,000 crores.
- Increase in IT exports from the State to INR 8000 crores.
- Focus on development of Financial Services, Mobile Applications, and Animation, 3D, Gaming & Digital Entertainment, R&D and ESDM sectors and promotion of Open Source Technologies in Rajasthan.
- Improvement in delivery of public services by leveraging e-Governance and m-Governance to achieve Efficiency, Effectiveness, Economy, Transparency, Accountability and Reliability in service delivery across all departments and functions and Re-engineer the Government business practices and rules to ensure hassle free service delivery.
- Establishment of end to end Rajasthan State Resident Data Hub and ensuring complete Service Delivery under the aegis of Government of Rajasthan in an automated manner

- Ensuring requisite connectivity to all Government offices up to Panchayat level by 2016
- Supporting entrepreneurs to establish and grow in various verticals of the IT industry by providing incentives and support.
- Making two individuals (at least one female) in every household e-literate so as to bridge the digital divide.
- Enhancement in digital literacy and increase employability of youth by strengthening of the IT curriculum and infrastructure of educational institutions and promoting the use of IT.
- Rise in awareness among the school and college children and society as a whole regarding environmentally sound e-Waste management and take steps for its proper disposal.
- Implementation of a uniform website policy for Rajasthan Government with emphasis on user-friendliness of the interface for all inclusive percolation of the benefits of the IT.
- Encouragement to research & development and innovation in product design, testing, calibration and production in Electronics System Design & Manufacturing industry for tapping the potential in the IT hardware and the electronics industry.
- Have the best in class ICT and allied infrastructure thereby ushering efficient and effective developments within the government and in the sector as such.

Rajasthan has proved to be the trendsetter in eGovernance initiatives, ensuring the maximum ease to residents till the last mile in connecting with the Government as well as getting benefits at their doorstep. We are the first state in the country to have implemented an integrated and unified eGovernance Framework, ensuring a world class coherent environment of integrated platforms – maximizing utilization and minimizing investment for betterment of eGovernance initiatives in the state. We are committed to translating our vision into reality, utilizing initiatives like Digital India, Smart City, Smart Grids etc. along with the finer points of Governance - citizen centricity, service orientation and transparency. JDA Smart City project and Rajasthan Smart Grid shall prove to be steps forward ensuring a Smarter Jaipur and a dual impact of improved productivity in transmission network leveraging the same infrastructure for broadband network required for delivering e-services, saving huge costs. Rajasthan eGovernance and ICT Policy 2014 envisages promoting citizen access to ICTs for encouraging their participation in e-governance. The Policy is for the people, by the people.

Plan vs Performance for the year Apr 2015 - Mar 2016

Table: Plan vs Performance

Item	Planned	Actual
ICT Outlay (Rs. Crs)	669.49	575.48
ICT Capacity Building (Rs. Crs)	1.67	0
SDC (Nos)	200	200
CSC (Nos)	35000	35000
ICT Projects (Nos)	Continuous, more than 50 projects	Continuous, more than 50 projects

RESULT INDICATORS

- Establishment of High Speed Wi Fi Hotspot at 515 locations across Rajasthan
- Development and implementation of new Rajasthan eGovernance and IT/ITeS Policy 2015
- Addition of IT, ITeS, ESDM and Robotics as priority sector by the Government
- Enrolment of more than 4.40 Crore residents under AADHAAR out of total 6 Crore
- Establishment of Rajasthan Samprk – The only integrated and unified Grievance Redressal Platform in India – with grievance redressal facility through online portal, Call Center and Rajasthan Sampark Centers across Rajasthan
- Integration of Jan Sunwai and CM travel module with Rajasthan Sampark
- Establishment of Rajasthan VC platform for Video Conferencing facility till Block level
- Establishment of Integrated Rajasthan GIS platform, with embedded GIS based Decision Support System
- Establishment of Integrated Citizen Contact Centre, with integrated helpline number for all applications
- Initiation of service delivery through mobile
- Establishment of Digitally Signed Certificates
- Establishment of RajNET to provide connectivity to every GP and installation of IP Phones at each location.
- Mandatory eProcurement for all procurement above 25 Lacs.
- eProcurement for more than 105 department and procurement worth INR 41629.51 Crores done through the platform
- Implementation of Raj eVault, with more than 2 Crore Raj eVault accounts
- Implementation of Rajasthan eGovernance Architecture and eGovernance Framework
- Mandatory electronic service delivery through one platform for all government services
- fully implemented ePDS system with more than 300000 transactions per day through more than 26000 ration shops
- integrated and centralized, fully implemented health insurance scheme – Bhamashah
- integrated sector portals for ease of access
- integrated communication platform covering email, SMS, IVRS, GIS – eSanchaar and iFacts
- implemented Video Conferencing facility till GP level
- intelligent Service Delivery Gateway, with more than 500000 transactions per day – Raj SewaDwaar
- Connectivity upto 1 mbps already provided till GP evel
- More than 35000 centres of service delivery, First state to be VGF free, all centers self sustainable
- More than 290 services
- More than 300000 transactions per day
- The entire infrastructure as well as platforms till are integrated the village level, with complete backend automation

- fully implemented Service Oriented Architecture and eGov Framework
- integrated Resident Data Hub and DBT Engine
- Direct Benefits Transfer worth more than 3000 Crores
- Direct Pensions disbursement to more than 55 Lac Beneficiaries
- Implementation of Crowd sourcing platform
- End to end GPS Monitoring and Biometric Attendance mechanism implementation
- Development of Sector portals
- Disposal of more than 7,50,000 grievances on Rajasthan Sampark
- Registration of more than 4,00,00,000 residents on Bhamashah platform

ENABLER INDICATORS
Bhamashah
- Resident Data Hub:
    - Comprehensive family/resident profile, including entitlements pertaining to all the departmental schemes
    - To be mandatorily used by all departments for deciding entitlements
- Unique ID for both family and individual; lady of the house as 'Head of the Family'
- All cash and non-cash benefits for a family available at one place
- Built in DBT engine, configurable for any new service
- Financial inclusion and banking service near the doorsteps of the residents

eMitra
- Provide a wide range of services of various government & private organisations in a citizen-friendly manner under one roof, so that citizens
- can overcome the inconvenience faced in moving around various offices
- Empower women by providing them business opportunities
- Generate employment opportunities for people till the grass-root level

Rajasthan Sampark
- Integrated portal (www.sampark.rajasthan.gov.in) with grievance redressal workflow
- Grievance registration through:
    - Web Portal
    - eMitra Kiosk
    - Call Centre
- Application includes SMS integration, GIS linked inspections/visits, reality check functionality for disposed cases, provision to collect feedbacks and extensive monitoring of public grievances
- Integrated with the State Call Centre 1800 180 6127
- Accessible through mobile application as well

ePDS
- Delivery through lightweight hand held Point of Sale (PoS) devices, using GPRS connectivity, at all fair price shop (around 26,500 in numbers)

- Identification/validation of the beneficiary through Aadhaar biometric
- Complete stopping/avoiding proxy withdrawals and addressing diversions & leakages
- PoS can be used for other departmental interfaces as well

Bhamashah Health Insurance Scheme
- Web-based application for implementation of Health Insurance Scheme including processing claim and payment for the insurance
- Single platform to facilitate implementation of Health Insurance Scheme under the broad umbrella of BhamashahYojana, having authentication with UIDAI and Bhamasha card/number
- Integrated with important applications across the State like: (i) Bhamashah Database Hub (ii) UIDAI Database Hub (iii) Arogya Online (iv) eAushadhiand (v) eMitra
- Increased efficiency and effectiveness of the scheme with transparency and reduced complexity with 24x7 availability of the system to the patients for filing claim
- Can be used for government pensioners/employees as well

eSanchar and iFact
- eSanchar can be linked with any departmental application for sending event based notifications to applicants/beneficiaries as well as officials
- iFact can be used by any department through Rajasthan Sampark as well as departmental application for Reality Check

RajNET
- Umbrella network connected with existing networks like RajSWAN, SecLAN, etc.
- Multi modal connectivity like VSAT, Captive OFC, RF and terrestrial connectivity, monitored through a Centralised Integrated Network Operating Centre
- Can provide connectivity even for remote departmental offices/ out-posts

Video Conference Facility in Rajasthan (RAJVC)
Room based video conference facility at District Collectorate and Block Level Offices

State Data Center
IT infrastructure on cloud and shared basis is available, apart from caging facilities for departmental servers

Wi-Fi network
Wi-Fi network in various Government building, public and tourist locations in Rajasthan

Raj SewaDwaar
- Intelligent Middleware Enterprise Service Bus of Rajasthan, ensuring easy, secure and transparent access of all Software Services in a centralised manner
- In line with the Rajasthan eGovernance Architecture, ensuring access to all web services/APIs in a centralised fashion
- No need of P2P connectivity between applications or multiple sharing of web services/APIs
- Centralised monitoring, rationing of services, integrated plans combining bouquet of services with transaction/frequency control
- Centralised monitoring of all transactions in an integrated environment
- Language constraint free service sharing, i.e. any-to-any service type integration – JSON, REST, APIs, XML WSDL, etc.
- Centralised API store for Rajasthan. All services shall be available for usage by government departments, external developers/agencies/ organisations through this ESB platform in form of APIs/web services.

Single Sign On
- All the departmental applications would use single user manager
- This will enable all the functionaries to access multiple applications after signing only once
- All departmental applications can link SSO

Rajasthan State Geo-Spatial Data Infrastructure and Unified GIS Portal
- Unified Platform for depicting various layers and hosting GIS based applications
- Collect spatial and non-spatial attribute data for various State infrastructure, public/private assets and point of interest
- LiDAR scanning and 3D modeling of selected heritage monuments/ structures like HawaMahal, JantarMantar, Albert Hall, City Palace-Jaipur and City Place-Udaipur, 7 Gates of Walled City, etc.
- Departments can build their layers on the platform and also share the layers created by other departments for decision making
- The resulting map can also be embedded in departmental website/application

Raj eVault
Secure and authorized eSpace with electronic self attestation and eVerification

Raj eSign
Secure and authorized electronic signature – hassle free digital signing for electronic self attestation and eVerification

Chief Minister Information System (CMIS)
- Timely and accurate information to Hon'ble CM and senior most government officials on anywhere - any time basis
- Single Sign-on for the application modules and integration with GIS, with development of new modules in an integrated manner
- Can be linked to departmental applications for seamless information entry

Integrated Financial Management System and eGRAS
- Centralised preparation and management of state and departmental budget
- Unified financial position of the state on real time basis
- End-to-end treasury, stamps and budget management
- Centralised pay manager and pension modules
- Detailed Works Accounts Monitoring System
- eGRAS for collection of tax/non-tax revenue in both online as well as manual mode

State Master Centralised Data Hub
- Master data hub will provide all types of master data required by client applications of various departments
- The Master Data Hub contains varied data ranging from geographical hierarchies to various kind of master data being used in departmental applications
- The master data hub shall be accessible through services or APIs
- Two types of master data – generic and department specific- shall be available
- The departments shall have the facility to create their specific data hubs directly in the Master Data Hub
- Secure mechanism has been used to consume services. This solution is based on service oriented architecture.

Rajasthan Accountability Assurance System
- Real time tracking of vehicles and mobile phones on a common GIS platform
- Integrated GPS tracking of vehicles, mobile application for GPS Tracking, Integrated Security Application, Detailed Analytical Reporting of vehicle usage, etc.
- Integrated Biometric Attendance Management and Leave Management Platform for the State

Mobile App Development Center
- Established platform for mobile application development, deployment and management
- Departments can use development stack for development of mobile apps responsive on all OS
- Department can consider development through Development Centre also

Data Analytics & Big Data Cluster
- Business intelligence and data analytic platform for advance analysis and fraud framework
- Departments can store unstructured data (sound, images, videos, etc.) in Big Data cluster at DoIT & C
- Departments can plug in their data sets for analysis and related graphical presentation

USE OF SOCIAL MEDIA, CLOUD COMPUTING, MOBILE TECHNOLOGIES

Social Media

- The State is actively available on social media for all primary schemes and programs
- The Hon'ble CM herself has a Facebook and Twitter following of more than 55 Lacs and 720K respectively and is active on all social media platforms
- All G2C platforms are available on social media
- Dedicated social media team is available with DoIT&C and CMO
- Detailed analytics are run on all social media and web platforms

Cloud Computing

- All applications on service oriented architecture
- Business intelligence and data analytic platform for advance analysis and fraud framework
- All applications and platforms available on SaaS and PaaS basis through the state middleware, called Raj SewaDwaar

Mobile Technologies

- The state has its own in house Mobile App Development Center
- Established platform for mobile application development, deployment and management
- Departments can use development stack for development of mobile apps responsive on all OS
- Department can consider development through Development Centre also
- More than 28 apps including transactional and realtime apps available on all leading mobile platforms

GREEN COMPUTING & E-WASTE MANAGEMENT

All Departments/ Companies/ Corporations/ Institutions/ Organizations/ Bodies must ensure that there are proper procedures in place for the condemnation and disposal of IT equipment that is unserviceable or is no longer required. This policy is applicable to the following departments and bodies:

- All Government Departments under the aegis of Government of Rajasthan
- All Companies/ Corporations/ Autonomous Bodies/ Local Bodies under the aegis of Government of Rajasthan
- All PSUs under the aegis of Government of Rajasthan

There is clear definition of IT Equipment, covering Hardware, Software and other peripheral items with clear demarcation for e-Waste Management. For all condemnation cases, the concerned department forms a committee comprising of minimum 3 members, one of which is from the finance/accounts department and one member is a representative of DoIT & C in the department. If in case there is no member of DoIT & C in the concerned office, the matter shall first be escalated to the HO of the concerned department and if not resolved, then to the DoIT & C.

The ICT Products/Equipment can be condemned on following grounds:
- Technically obsolete
- Beyond Economical Repairs
- Non-repairable
- Physically damaged

Disposal/Alternate Use
- The primary mechanism of alternate use, which must be considered in cases where the said item(s) are still in usable condition, should be to transfer the item(s) to Government School(s) of the districts in which the said office is located.
- For this purpose, if the said item(s) are found usable by the DoIT & C representative in the department, a committee with DEO/BEO should be constituted to decide where the items can be sent for optimum usage.
- Only if the possibility of usage by Government schools is found negligible, should the process of disposal be initiated by the department/office.
- The mode of Condemnation may be done either by Buyback or Disposal, as decided by the committee formed for condemnation by the concerned department.

NEW PROJECTS /INITIATIVES LAUNCHED DURING THE YEAR
Bhamashah
- Resident Data Hub:
  - Comprehensive family/resident profile, including entitlements pertaining to all the departmental schemes
  - To be mandatorily used by all departments for deciding entitlements
- Unique ID for both family and individual; lady of the house as 'Head of the Family'
- All cash and non-cash benefits for a family available at one place
- Built in DBT engine, configurable for any new service
- Financial inclusion and banking service near the doorsteps of the residents

Rajasthan Sampark
- Integrated portal (www.sampark.rajasthan.gov.in) with grievance redressal workflow
- Grievance registration through:
  - Web Portal
  - eMitra Kiosk
  - Call Centre
- Application includes SMS integration, GIS linked inspections/visits, reality check functionality for disposed cases, provision to collect feedbacks and extensive monitoring of public grievances
- Integrated with the State Call Centre 1800 180 6127
- Accessible through mobile application as well

New State Portal
- Single source of information for all Government matters for citizens and government users
- Single window interface for all informational/transactional Government services for citizens, businesses and overseas people
- Will link up dynamically with departmental web portals. This will ensure real time information updation through departmental websites.

Integrated Government Portals
- Standardisation of websites/portals/web applications ensuring availability, accessibility and responsiveness
- Enterprise web content management and centralised deployment
- All portals compliant on all devices, mobile applications for all portals

Wi-Fi network
- Wi-Fi network utilises the SecLAN-MAN and RajSWAN network as backbone to provide network connectivity and internet access to its user
- Seamless connectivity, Wi-Fi connectivity and internet access through user login ID and password to all the subscribers with central authentication mechanism
- Online log trails for any specific user
- Capable of managing automatically upgrade or degrades of end user's account after threshold usage (download/time limit) is reached
- Dedicated team for support at SDC, Jaipur with centralized administration of the network through NAS
- Can be established in government premises as well

ePDS
- Delivery through lightweight hand held Point of Sale (PoS) devices, using GPRS connectivity, at all fair price shop (around 26,500 in numbers)
- Identification/validation of the beneficiary through Aadhaar biometric
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- Departments can store unstructured data (sound, images, videos, etc.) in Big Data cluster at DoIT & C
- Departments can plug in their data sets for analysis and related graphical presentation

Raj eOffice
- Generic office module with focus on integration
- Centralised and unified office management beyond simplistic approach of post-facto decision with dashboards, eForms, virtual drop box, etc.
- Departments can create dashboards from multiple applications on a single screen

Mailing Solution
- Electronic mail system for all government departments, organisations, corporations and affiliated organisations in a centralised mechanism
- Organisation specific domain name in electronic mail (multi tenant architecture) eg. xyz@rvpn.co.in/xyz@rvpn.rajasthan.gov.in
- Flexible sizing and implementation of mailboxes
- Easy to use platform

Education Portals
- Option for both online viewing and downloading, storing and viewing offline
- Facility for teachers to create, review and publish content on solution with good quality content including option for development, aggregation and management of contents
- Group collaboration features for students and teachers. Centralised University/College Automation System shall have functionalities like online registration, fee submission, counselling, merit generation and seat allocation, examination management from creation of papers to declaration of results,

student management including semester, attendance, courses, academic, marks, etc.

- The portal is accessible on different client devices like PC, laptop, smartphones, tabs, etc.
- Can be used by departments for providing their content as study/reference material
- Can also be used for departmental training requirements

End-to-End Examination Solution
- Envisaged to have standard framework for conducting various recruitments for filling up government posts through Rajasthan
- Subordinate and Ministerial Services Selection Board (RSMSSB) and departments
- Main features are registration module for online registration of candidates, payment of fees using eMitra and other payment gateways, question bank module for preparing question bank and paper setting, download admit cards and centre allotment module, online examination module for conducting exams online, result module for publishing the result
- Integration done with various other citizens' portal like employment portal, Rajasthan State Portal, etc.

Mr. Ashutosh M. Deshpande, *Technical Director & Joint Secretary –DoIT&C, Department of Information Technology & Communication, Government of Rajasthan, amdeshpande@rajasthan.gov.in*

Telangana State
Government of Telangana

Jayesh Ranjan

STATE SUMMARY

Since its inception in 2014, Telangana has been quick to jump onto the bandwagon of e-Governance through its various initiatives. It has been one of the frontrunners in adopting various Central Government Initiatives such as Swacch Bharat Abhiyan, Digital India etc. Moreover, Telangana has itself launched parallel programs more ambitious than the central programs. Primary among them is the Digital Telangana Initiative.

Digital Telangana

Digital Telangana stands on two pivots and each of them representing the supply and the demand side. On the **supply side**, the main aim is to ensure that digital facilities become available to each and every person in the state. This is being made possible through:

- Laying OFC to each household using the water grid trenches
- Providing 4G services in the entire state
- Wi-Fi in major cities and towns
- e-Panchayat scheme under which a One Stop Shop kiosk will be available in each Panchayat

Outlined below are the different initiatives undertaken under the supply side:

Telangana Fiber Grid (T-Fiber)

Telangana Fiber Grid (T-Fiber) is implementing a scalable, high quality, long lasting, resilient & secure state-of-the-art digital network infrastructure for providing affordable high speed broadband connectivity, and provides government digital services, to entire State, comprising of 10 districts connecting 83.58 lakh households. T-Fiber facilitates and realizes the vision of Digital Telangana to usher in digital democracy with an affordable & reliable high-speed broadband connectivity to every person in Telangana. T-Fiber is first of its kind network in India, where it connects every home with an optical fiber termination installing an end user equipment to avail digital services. Services will begin at end of 2017 and reach full scale implementation by end of 2018, coinciding with the completion of Mission Bhagiratha. T-Fiber piggy backs on the Mission Bhagiratha Project, which is providing safe drinking water to every household through water pipelines, thereby achieving right of way (RoW) across the whole State while saving costs of digging and trenching. The network will be deployed along water supply routes which have been already mapped for the entire state.

T-Fiber installs, owns and maintains end-to-end network infrastructure all the way from State Headquarters to District Headquarters to Block Headquarters to Gram Panchayats and up to the households. T-Fiber provisions bandwidth and/or lease infrastructure to operators, telecom service providers (TSP), internet service providers (ISP), multiple system operator (MSO), local cable operator (LCO), Virtual Network Operator (VNO), Cellular Operators, on non-discriminatory and non-monopolistic manner without entering into competition (except in delivery of G2C and G2G

services). The implementation of the T-Fiber infrastructure is done under a joint SPV created with State and Centre participation.

Hyderabad City Wi-Fi Project
A pilot has been launched to provide Wi-Fi connectivity at 200 public locations with 3 service providers. Over 3000 such locations have been identified and the roll out of Phase 1 covering 1000+ locations has been initiatives and will be completed in the next couple of months. The GO for entire project has been drafted forwarded and the issue is imminent.

One Stop Shop/Palle Samagra Seva Kendram/Digital Telangana Centre
To provide convenience to the citizens in the villages through use of Electronic Platform, Government of Telangana has decided to make available 3 key services i.e Citizen services, Banking Services and Benefit Transfers (Welfare pensions and MNREGA wages) at the Panchayat Level by setting up dedicated centers in the Gram Panchayats. These centers are called Palle Samagra Seva Kendralu or Digital Telangana Centers (PSSK/DTC).These centers are operated by educated un-employed women called Village Level Entrepreneurs (VLE) on a self-sustainable model. The investment in the infrastructure like PC/Laptop/printer/scanner etc is done by the VLE herself, though in many cases loan is arranged for. The VLEs are selected through a process of interview conducted by the Rural Development department. The aim is to cover all the Gram Panchayats (about 8695) in next three years. This is first scheme in the country where 3 different services, namely Citizen services, Banking Services and Benefit Transfer services are brought on to single platform.

Similarly, on the **demand side**, the intention is to make each and every person digitally empowered so that he/she can make best use of the digital facilities that are being made available right at his/her doorstep. The strategies for this include:
- Digital literacy program: To enable at least one member of each household to become digitally literate
- School computer literacy program: To teach every child from Class 6 onwards the basics of computers
- Expansion of MeeSeva services
- Identifying technology solutions for all government agencies to provide better services to the citizens

Outlined below are the different initiatives undertaken under the demand side:

Telangana Digithon
A digital literacy program named 'Telangana Digithon' has been launched on August 27th 2015 in partnership with Telangana Information Technology Association. In the first phase, the Government has trained 10,000 Digital Leaders under the Training of the Trainers program. These trainers further travel to remote areas and train users. TITA has also developed a Mobile Application for the Telangana Digithon trainers by name **"Mobile Digithon",** which will be launched very shortly. The TITA is also devising flash mobs on digital literacy under the name **"Dance for Digital Literacy"**.

TS-CLASS

Under the TS-CLASS program, there are 4 focus areas:

- Infrastructure – Includes setting up on necessary hardware to deploy digital learning solutions.
- Content – Includes digitization of current curriculum and additional useful resources
- Training – Includes teaching method of system operation, maintenance and content delivery to enhance sustainability
- Connectivity – Includes provision of minimum 2 MBPS network to the devices in the digital classrooms

Currently, a pilot program was run on 10 schools to fix upon the content delivery solutions that should be adopted. Post the program, we have collaborated with ISB to evaluate the different solutions and shortlisted vendors. We are currently holding discussion to identify the vendors' requirements and commercial terms to launch Phase 1. Phase 1 will cover 1000 schools which have been identified post a comprehensive health checkup of the hard ware conducted by Tata Institute of Social Sciences (TISS) at all the schools.

Expansion of MeeSeva Services

Telangana strives to bring all Government services to its citizens on a digital platform. Moreover, efforts are being made to deliver these services on mobile platform. Currently, 335 different services across 35 departments are live on the MeeSeva platform. There are over 4000 MeeSeva centres in the state, which have recorded over 70 Million transactions till date.

Technology Solutions for all Government Agencies

Telangana has been taking various initiatives to promote the use of IT among citizens and to use IT solutions to make the lives of citizens easier and Governance smoother. Some of the initiatives are:

- e-Agriculture
- e-Health
- e-Disaster Management
- Telangana Academy for Skill and Knowledge
- Platform for Technology Startups: T-Hub
- Women in Tech

An Officer of Special Duty has been deputed specifically for the purpose of leading Digital Telangana Initiatives. In addition to this, a xxx member PMU team and yyy member SeMT team have been established to correspond with each and every department of the Government and drive the development of IT and e-Governance Solutions there. Some of the initiatives taken up by these teams are listed below:

Verifast

The primary objective of this project is to ensure that the citizens of the state receive their passports in the shortest possible time by reducing the time taken for police verification of passport applicants. A database of all passport applicants along with the GPS coordinates of the address has also been developed. In addition to this, a green solution has been adopted by eliminating hard copies to the maximum possible

extent. Moreover, field verification has been integrated with other criminal/suspect information databases to ensure a 360 degree verification process. All of these have been developed on an open source platform and can be accessed on any hardware.

Ma Bhoomi

The crucial aspect of Land administration is maintenance of land records up to date and reflection to the ground position. Ma Bhoomi portal has been developed to provide free access to the public to view their land records information online and to obtain and redress grievances from public if there is any error or mistake in their land records through the portal itself. This website provides a platform for the citizens across the globe to view the land related information.

RTA M-Wallet

The mobile APP "RTA M-Wallet" has been developed on Android and IOS Platform to store the statutory documents like Registration Certificate, Driving License etc., in digital form while commuting. The centralized data architecture of Transport Department is utilized to fetch the details of documents on the smart phone. Once the free app is downloaded, registration done One Time Password is generated for use of the app.

To obtain documents such as Driving Licenses in the app, details of date of birth and Issuing Authority are keyed in. Other documents such as Registration Certificate and Insurance Certificate can also be retrieved by keying in relevant details. Once downloaded the documents are displayed on any mobile by using the log in facility. The App helps the Enforcing Authority for identification of document's genuineness and provided ease to the citizens during checking on the roads.

The Mobile App is aimed at serving 89 lakh Registered Vehicle owners and 76 lakh Driving License Holders to enable them to store their statutory documents. This app is the only Government app to be listed in the Top 100 Apps and has already been downloaded by over 1 Lakh users.

Mineral e-Permit System

Mineral ePermit System is an IT application for the Mineral Dealers in the Telangana State to get the passes through electronically for the minerals purchased from the lease holders to curb the illegal movement of Minerals in the state. Mines & Geology Department has utilized Mee Seva Online Services for Mineral ePermit System to bring in more effectiveness for hassle free delivery of services. The entire lease data has been computerised and the leaseholder can generate their permits online & the ADMG can confirm them by sending the field staff for confirmation.Statistics so far:

- So far 630 lease holders are registered with e-Permit System
- e-permits issued 8970
- Transit forms - 362289
- Collected Rs.274 Cr as Royalty so far.
- Collected RS. 4.05 Crs as Cess on MBL
- 2,79,500 Transit forms have been issued.

Although Digital Telangana is one of the major initiatives of the State, the recently launched ICT policy has identified various areas for the State to focus on. The policy has been formulated with the vision of making Telangana the most preferred

technology investment destination in the country. Telangana state targets to achieve more than INR 120,000 Cr worth of IT exports by 2020, growing at a CAGR of 16% and create more than 4lacs of direct employment and 20 lacs of indirect IT employment by 2020.

The state seeks to achieve these ambitious targets by providing a congenial industrial friendly climate for IT companies, by building/developing an industry-ready employment force, encouraging innovation, SMAC driven disruption and entrepreneurship within the State, spreading IT to Tier 2 locations, and finally leveraging IT as a tool for the socio-economic development of the region.

The government also aims to become the forerunner state in tapping the global SMAC (Social, Media, Analytics and Cloud Computing) market potential by attracting global technology labs, encouraging SMAC start-ups, facilitating SMAC training certifications & swiftly adopting SMAC technologies in the government initiatives.

In order to become the leading "technology start-up city" of India, the government has planned many initiatives and incentives ranging from setting up of ICT Innovation Equity and Debt fund for start-up investments, setting up a novel Technology hub (T-hub) in Hyderabad having more than 3 Lakh sqft of incubation/startup centers space and introducing structured program like Technology Entrepreneurship Program, deferred placement program to promote entrepreneurship in students.

Outlined below are the focus areas and the key points under each area:
Expansion of IT / ITeS Units
- In addition to identifying suitable land parcels for setting up new IT clusters under the ITIR scheme, the Government of Telangana shall also encourage the expansion of existing IT / ITeS units
- The Government of Telangana shall encourage IT/ITES companies to consider Tier II locations for setting up BPO centres that will enable them to reduce their operational costs significantly. The government shall also provide exclusive incentives for the first few anchor clients
- A separate critical infrastructure fund will be kept at the disposal of ITE&C department to support IT Parks. For the benefit of SMEs – a major contributor to our revenue, the government is not only constructing dedicated towers but also creating a financial vehicle that will help them thrive

Electronics
- With the single window mechanism of giving approvals and clearances within 15 days i.e. TS-iPASS, the state is creating a highly favourable environment for companies to set up and expand operations
- The Government of Telangana shall set up two EMCs spread over 600 acres and 310 acres for developing eCity and Maheshwaram Science Park respectively to place Hyderabad on the global electronics manufacturing map

Entrepreneurship
- Using T-Hub as a foundation, the Government of Telangana will aim to build the largest innovation and start-up ecosystem in the country, in partnership with private players and academic institutions
- The Government of Telangana has partnered with IIITH, ISB and NALSAR, and will initiate partnerships with IIT and BITS to ensure inclusion of academia from all verticals i.e. IT, Electronics, Manufacturing, Management, and Law to create an entrepreneurial atmosphere
- The Government shall encourage both private and public institutions to set up incubators, accelerators, seed funds, etc. to provide critical support to early-stage entrepreneurs

Skilling
- In tune with the National Program for Skill Development, the state's skilling initiative, Telangana Academy for Skills and Knowledge (TASK), shall ensure companies get easy access to a rich skill-base in Telangana. With customized training programs developed through constant industry feedback complementing prestigious educational institutions that exist in the state, the state shall ensure that human resource needs of IT companies across all sub-verticals are met

Procurement of IT Products and Services by the Government
- The IT Department team attached to every government department will interact with technology developers including large companies, SMEs and start-ups to identify innovative technology solutions that can be used to modernize public sector initiatives

New Initiatives
- The Government will establishment state of the art facilities for Gaming & Animation and Data Analytics which will be closely linked with entrepreneurship efforts of the State
- Investments in critical and emerging areas such as Cyber Security shall receive special focus and incentives from the Government
- The Government of Telangana will encourage technology developers to identify new solutions for under-explored areas that shall propel the development of Hyderabad into a smart city

E-Governance and M-Governance
- The government intends to develop a portfolio of mobile applications for delivery of citizen services through phone. The government will facilitate this through telecom providers and existing application store proprietors

Promotions
- The Government shall participate in international and domestic trade shows, conferences and seminars to highlight the advantages the state offers for the IT/ITES, Electronics and related sectors and consolidate its position as the preferred investment destination

Enhanced Quality of Living
- To ensure high level of people satisfaction the Government of Telangana shall actively work towards building Brand Hyderabad by hosting a gamut of conferences, industry conclaves, trade expos and cultural events

Plan VS Performance (for the year Apr 2015 – Mar 2016)

Table: Plan vs Performance

Item	Planned	Actual*
ICT Outlay (Rs. Crs)*	130 Cr	135 Cr
ICT Capacity Building (Rs. Crs)*	NA	NA
SDC (Nos)	1	1
CSC (Nos)	4400	4050
ICT Projects (Nos)	80	69

Most of the capacity building activities are undertaken with the help of the central programs, due to which exact figures of plan vs performance are not available. However, following are the details of the number of people trained:

Table: MeeSeva Overall abstract from 21.05.2013 to 31.07.2016

Sl. No.	Period	Sessions	No. of Kiosk operators Trained	No. of Department Officials Trained	Total Trained
1	01.05.'13 to 01.06.'14	2540	96534	17980	114514
2	01.06.'14 to 31.07.'16	1100	53129	736	53865
		3640	149663	18716	168379

RESULT INDICATORS
T-Fibre: DPR ready and project funding obtained. Work in Progress currently.
City Wi-Fi: 3000 locations mapped. Pilot Program launched and solutions studied. Phase 1 underway and 1000 locations to be wifi active in 2 months.
4G: Through collaborations with the private sector, covered 90%
Number of OSS/PSSK: 500+
Number of MeeSeva Centres: 4050
Digital Literacy: Registered = ~3.8 lakhs, Trained = 3.11 lakhs, Certified = 1.65 lakhs
TS-CLASS: Pilot program and study of solutions done. Identified quality vendors for Phase 1. 1000 schools to be digitized by October this year.
Number of MeeSeva Services added: 335 services across 35 departments
Number of MeeSeva transactions: 7 Cr+
Average Monthly Transactions: 12 lakhs

Tech Solutions

No of projects launched: 69

Few results of specific initiatives:

- RTA M-Wallet is the only Government app to be featured in Top 100
- 7 100% digitally literate villages
- 9,58,000 registered under the Biometric Authentication of Aasara Pensioners
- Issued 8970 permits and collected INR 274 Cr as royalty so far through the Mineral e-Permit System initiatives
- 66,325 applications have been received out of which 45,050 Loan Eligibility Cards have been issued online.
- Online Procurement Management System implementation:
  - Kharif-2015(No of Farmers Registered) = 236003
  - Rabi-2016(No of Farmers Registered) =324317
  - Total No of Farmers Registered = 324317
  - No of Transactions = 212467

ENABLER INDICATORS

Business process reengineering

The Telangana Government is focusing its efforts on a massive overhaul in the way things are done in the different departments. Recently, the ACB, Drug Control, and Transport departments have gone completely online. Citizen services too are being delivered online in a citizen-centric manner. National programs such as Digilocker have been tweaked to further enhance the experience of the citizens and re-work the processes followed. For Ex. Under DigiLocker a facility for requester has been integrator, using which any organization requiring any certificate of a user can request it online and the user can provide for it online itself. Moreover, eOffice software is being implemented across all departments through which all the files will be converted online expediting all the processes. Several such initiatives are being taken to enable results.

Technology adaptations/ Innovative deployment

By appointing an Officer on Special Duty to drive the Digital Telangana program, an organized approach is taken to drive technological innovations across all departments through the OSD, PMU and SeMT teams. One such example is the Disaster Management Portal. Hyderabad has seen one of its worst summers in 2015 causing many deaths. Identifying this as a huge problem, the OSD has launched a project to develop a portal, which after taking inputs from all the CDAC and other sensors in the state, will predict the possibility of a heat wave in the next few days and alert citizens to take necessary precautions. This project is now being expanded to draught and other calamities. Several such niche initiatives are being undertaken using technology adaptations.

Industry best practices, standards followed

The best practices from across the globe are being incorporated into the State's policies to enable the State to make significant advances. For example, TS-iPASS aims to provide a single window clearance for companies willing to start operations in Telangana within 15 days after which it is auto-approved if not rejected. This is a one of a kind initiative formed by taking the best practices across the world and has

enabled us to attract the best firms to the state, thereby increasing the State aptitude for technology.

Role of leadership by way of policy support/ direction

The Telangana State has already drafted its ICT policy framework and 4 sectoral policies under it. 4 more policiesare already underway. The Telangana State strives to take an organized and focused approach to driving IT initiatives by way of these policies.

Moreover, the ITE&C department of the State was previously more of a maintenance oriented department. Over the last couple of years, through dynamic leadership, it has established itself as a service oriented department. The Minister himself has written to all other departments to initiate this transformation.

Stakeholders inclusiveness and participation

The Telangana Government actively engages with the relevant stakeholders before taking any major decision. Individuals and companies are encouraged to discuss their initiatives with the Government to ensure maximum collaboration between them. The ITE&C department is in constant touch with HYSEA and NASSCOM, two trade organizations, through with it keeps itself up to speed with the latest happenings and requirements of the industry.

Organized and focused approach to drive initiatives across departments

Over 5 teams work directly under the OSD and the Secretary to drive initiatives across all departments. One nodal officer has been assigned to each department to study processes followed and reach out actively with them to identify potential areas where IT solutions can ease processes. These teams not only come up with these solutions, but also help them identify quality vendors and handhold the departments through the implementation process.

USE OF SOCIAL MEDIA, CLOUD COMPUTING, MOBILE TECHNOLOGIES

Social Media

Telangana Government is leveraging the state-of-the-art technologies like Facebook, Twitter and YouTube to disseminate information to citizens by establishing virtual connect with them. The connect enables both round the clock, real time and personal access to Government services. Telangana Government manages Facebook Pages, Twitter Handles, YouTube Channels for Telangana CMO, Cabinet Ministers, Line Departments, Flagship Programmes like Mission Bhagiratha, Mission Kakatiya and periodic official events like Pushkaralu, Bathukamma Festival among others. The advantages of ICT revolution are fully utilized by the Government by posting text, images, videos on the topics of public importance. The same can be availed across platforms, devices and in different formats thereby improving, promoting and optimizing the ease of access. Accessing Government services through various social media platforms gives the user great operational freedom and low cost of ownership since all he needs is stable internet connection. The users can even store the public information on their local disks with no costs involved.For the month of July, 2016, the combined reach of all the accounts on different social media platforms stands at a whopping 1.12 crore online users. With such humongous reach and user base,

Telangana Government often falls back upon reactions on social media to know the public pulse and redressing the grievances, as the case may be.

Cloud Computing

All cloud systems on some virtualization technology. Various virtualization techniques are software defined compute, storage and network. In SDC compute virtualization has been implemented. Some of the critical E-governance workloads such as MeeSeva are running on the computer virtualization platform/Software defined compute. Storage virtualization/Software defined storage is planned for implementation. Post this software defined networking is planned. The objective is to build/transform the SDC to software defined data center(SDDC).

Mobile Technologies

In order to leverage the use of mobile technology in Governance, the ITE&C Department has constituted a Mobile Application Development Team, whose specific purpose is to promote m-Governance by bringing all Government services onto a mobile platform and develop applications which will help the different departments deliver better services to the citizens. Mobile Application Development Team aims to leverage wireless and new media technology platforms, mobile devices and applications for delivery of public information and services to all citizens and businesses. Also it widening the reach of, and access to, public services to all citizens in the country, especially in the rural areas by exploiting the much greater penetration of mobile phones in the country. It also leverages the innovative potential of mobile applications in providing public services. The overall strategy aims at making India a world leader in harnessing the potential of mobile governance for inclusive development. The Mobile Application Development Team is efficiently taking up the projects for Development of Android based Mobile applications in all the Government Departments as per the requests and catering all the needs of the user departments. Some of the many initiatives are listed below:

Tools &Technology Used for the development

Android SDK, jdk1.6+, Eclipse IDE, SQLite and web service (Push and Pull data to server).

NDLM AUDIT FORM Mobile Application:

A mobile based application developed to capture the information of NDLM centre's infrastructure. The objective of this mobile application is get the information of NDLM audit form, operations, questionnaire trainer, questionnaire beneficiary, practice test and NDLM centre's location on Google map. By using this mobile application, we can capture the information of NDLM Centers and beneficiary.
In this application there are two modules such as:
- Center Trainer Survey
- Participant Survey

Inspection Report App (Drugs Control Administration Department)

The Drugs Control Administration Inspectors' mobile app (Android) will work Online & Offline and found to be a useful tool for conducting and reporting inspections by the Drug Inspectors in the State. This DCA Mobile app is simple to

use and very user friendly and it enables department to save time in writing the inspection report and concentrate more on the inspections. The data related to the shops can be retrieved with minimum data entry related to the firms and reduces the paper work. The data related to the previous inspections will be stored in the back end and it can be verified as and when required by the officials. This DCA App can be generated canned MIS reports.

It has the following features:

- Any Where / Any Time Access
- Online / Offline mode
- Easy Submission of Field Reports
- Minimal Data Entry
- Integrated/Aligned to Department work flow
- Demo has been given to all districts Drugs Inspectors in Telangana State through video conference.

L R MSMobile Application (CCLA Department)

This Android Application is used to capture the geo tagged photographs of the structures along with the beneficiary for recommended applications to regularize the unobjectionable Government land and surplus land under Urban Land Ceiling. This application works both online and offline. In offline mode when there is no network connection, the data captured is saved in phone local database. It is uploaded to the server once the user connects to the internet.

Table: District wise report

Sl. No.	District	Applns. Recommended for Patta	Building Photo Uploaded
1	Adilabad	8631	6560
2	Hyderabad	12573	1134
3	Karimnagar	1791	1761
4	Khammam	1671	1568
5	Mahabubnagar	451	381
6	Medak	4849	4446
7	Nalgonda	2013	1851
8	Nizamabad	170	170
9	Ranga reddy	63398	15
10	Warangal	4772	2112
Grand Total		**100319**	**19998**

Aadhaar Seeding with Pattadar Khata number (CCLA Department)

An Android application is being developed to complete the Aadhaar seeding to the pattadar. Pattadar data is maintained in a database and village wise pattadar details can be fetched from there. The Aadhaar number is seeded with pattadar details through an android mobile. This application works both online and offline.

Salient Features
- Used android APIs like GPS service, Google Map, Telephone Manager and Camera.
- Used verhoeff algorithm for Aadhaar number validation.
- Aadhaar Seeding district wise report.

Table: District wise report using Android App

District	Total no.of Khatas	Total no.of Khatas Seeded using Android App	Khatas Seeded using Android App with UID's
Mahabubnagar	1270169	848703	243533
Rangareddy	505715	249430	53985
Medak	901797	460576	35661
Nizamabad	655201	265380	13485
Adilabad	678944	284918	31360
Karimnagar	942358	507849	20412
Warangal	769257	392375	14328
Khammam	472462	69277	18480
Nalgonda	1023642	577209	108219
Total	**7219545**	**3655717**	**539463**

Crop Booking Mobile Application (CCLA Department)

Village Revenue Officer usually manually provides the details about Crop particulars to the District Administration, which is unverified. To overcome this, a mobile based application has been developed to capture the field level information pertaining to crops and transmit to the central server through **GPRS** in real time. If required GPS coordinates and image may also be captured. Once the required data is available at the central server, it will be very easy to carryout analysis and initiate next steps for processing the data i.e. drill down state level MIS.

GREEN COMPUTING&E-WASTE MANAGEMENT
Green IT Initiatives

Telangana Government is leaving no stone unturned to promote clean and green initiatives such as:

Car Free Thursday – In association with HYSEA, the Telangana Government is promoting the IT industry to not use cars on one day of the week, thereby reducing the overall carbon footprint.

Green Buildings – Special incentives are given for companies who operate in green buildings, which are as per the guidelines issued by the Government.

SHE Shuttle – In order to ensure safe public transport for women IT employees, special ladies-only shuttle called SHE Shuttle have been arranged from and to concentrated areas.

Cycle to Work Campaign – All employees are encouraged to cycle to work and several promotional events are held in this regard from time to time.

Haritha Haram – Under the Haritha Haram Program, the Chief Relationship Officer of the ITE&C Department constantly engages with the IT companies to plant saplings. In the recent Mega Plantation Drive, the IT industry has contributed by planting over 50,000 saplings, provided with over 2500 volunteers, and helped raise sponsorship money of ~INR 50 lakhs.

e-Waste Management
The Government of Telangana is working on three major areas with respect to e-Waste Management:

e-Waste Policy
In order to formulate a policy for managing e-Waste, the Government of Telangana has initially commissioned a study to identify best practices around the world and the shortcomings of the system here. After numerous rounds of discussion with the relevant stakeholder such as private players, trade organization such as NASSCOM, e-waste management firms etc, the department has envisioned a policy-driven solution where all e-waste is channeled through a single umbrella system, thereby keeping a track on the amount of e-waste generated and the recycling process. In addition, this will provide e-waste generators (consumers) a hassle-free, single-window approach to 'responsible disposal' of e-waste.
The policy will discuss a three-pronged approach to tackle this problem:
- Reuse – focus on reusing products by refurbishing them
- Reduce – focus on reducing the amount of e-Waste generated
- Recycle – focus on safe processing of products that have reached end of life

Two key focus areas for the Government along this process will be:
- As a pilot project, the Government shall establish an organization that will act as a collection agency. This organization shall identify reusable products, get it refurbished through authorized partners, and sell these products to NGOs, Government Schools, low-income individuals at a subsidized cost. Moreover, once these products reach the end of their usable life, this organization will take them back and ensure they go through the normal process of recycling. Due to this, the companies or individuals who donate their equipment can be rest assured that their systems are responsibly disposed.
- In order to ensure that the last step in handling e-waste (processing of segregated components) becomes commercially viable for the organized sector, the Government shall enter into partnerships with such units and acquire a stake in these facilities. This step, along with the constant monitoring from the organization mentioned above will ensure that the waste is processed through the right channels.

In addition, an awareness campaign on the adverse effects of not disposing e-waste through the right channels and judicial usage of electronic equipment will be launched.

Startups in e-waste space

Banyan Nation is a startup which works closely with the Telangana Government in the area of e-waste management, recycles plastics in house and other e-waste through external tie ups. The Government plans to provide a platform and support various such startups in the near future and a dedicated incubator under T-Hub for e-waste related startups is also in the pipeline.

NASSCOM Big Bridge Program

The Government of Telangana is collaborating with NASSCOM to enter a partnership with its Big Bridge program through which it aims to reuse electronic equipment to the maximum extent by providing NGOs and other such organizations with refurbished products at a nominal cost until they reach the end of their usable life after which it will be recycled in a comprehensive manner through NASCCOM's partners.

NEW PROJECTS /INITIATIVES LAUNCHED DURING THE YEAR
Telangana State – Computer Literacy and Skills in School (TS-CLASS):
The TS-CLASS program has been envisaged with dependencies on 4 major pillars.
Infrastructure:
- Infrastructure includes hardware such as devices and network equipment
- Health check to analyse the condition of existing hardware at schools has begun with assistance from TISS

Content:
- Content includes digitization of current curriculum and useful additional resources for secondary classes
- Team of progressive teachers has been identified to develop content with assistance from experts from corporate

Training:
- Training involves teaching methods of system operation, maintenance and content delivery to enhance sustainability
- 1 teacher per school and 2 model students per class shall be identified as trainers to encourage peer learning

Connectivity:
- Connectivity includes provision of minimum 2 MBPS network to the devices in the digital classrooms
- Companies such as ACT, Airtel, etc. shall be engaged
- Google, Microsoft and Facebook shall be contacted to discuss about their connectivity programs

After strict rounds of evaluation, the Government of Telangana has obtained a funding of INR 60 lakhs from the Department of Administrative Reforms and Public Grievances under the State Collaboration Initiative.

e-Health Centres

The ITE&C and Health Departments, Government of Telangana, in collaboration with HP have identified a disruptive innovation that combines the best of health and IT domains. The project, eHealth Centre (eHC), plays a critical role in contributing to healthy, vibrant communities and spurring economic growth. Further, the solution assists in maintain and expanding local and national healthcare initiatives. The cloud enabled primary healthcare solution consists of a shipping container with the requisite medical equipment, teleconsulting channel, health record storage over cloud and a complete dashboard deployed at a geographical location at an optimal physical distance from underserved communities. The eHC is equipped with fundamental, yet critical, equipment such as ECG, spirometer, glucometer, stethoscope, digital thermometer and a mini laboratory. Trained technicians at the eHC collect the vitals and relevant data from patients, which is shared with the doctors at the nodal healthcare centre. Post data analysis, the doctor at the nodal centre prescribes necessary measures/treatment/consultation to the patient. Further, eHCs are linked with a web based open EMR (Cloud) for automated health data upload from the remote monitoring facility. Additionally, the dashboard provides the government with crucial information for healthcare policy formulation, early epidemic detection, preventive healthcare and intervention, and disease surveillance in real time.Post several rounds of discussions with HP, the Government of Telangana has installed a couple of eHCs at Achampet and Mandanoor. In light of the roaring success of this initiative, the ITE&C and Health Departments plan to scale up the initiative targeting 10 centres across the State for Phase 1.After strict rounds of evaluation, the Government of Telangana has obtained a funding of INR 1.5 Cr from the Department of Administrative Reforms and Public Grievances under the State Collaboration Initiative to deploy phase 1.

e-Agriculture

With a growing population, increasing climate variability, and increase in occurrence of pests and diseases, agricultural production in the state of Telangana is challenged to achieve the food and nutritional security for its people. However, with the limited land resources and declining per capita availability of arable land, growing water scarcity and power shortages, producing required food is a gigantic task in the state. In order to enhance the agricultural production in Telangana, measures need to be taken up for dissemination of appropriate information at right time to farmers using digital agriculture platforms to increase the agricultural productivity of crops especially in Rain fed farming and to increase the profitability of farmers by connecting them to right markets. The knowledge about the improved management practices and improved cultivars/crops as well as reliable information about the soil nutrient status including micronutrients are not reaching to the farmers. To overcome these problems and realize the potential, the new initiative "PHABLET based digital agriculture platform" by providing an Integrated Farmer Management System, for sharing the knowledge with the farmers of identified locations in the state of Telangana has been initiated. It will also to connect small holders with markets to enable them to market their produce directly to consumers, wholesalers and retailers; thus reducing the number of middle men layers across crop value chains.

Integrated People Information Hub

The Integrated People Information hub is an integrated database of information pertaining to over 4 Cr people of the state of Telangana. Previously, the different departments of the Government had their own data base which did not communicate with data bases of other departments, thereby increasing redundancy. This new platform enables a Government department to pull information regarding the citizens. This platform also helps clean the data bases of fake persons using data triangulation. A mobile application called Citizen 360 is being developed for the different departments to make use of this application. This initiative can be used to target Governments programs better, minimize leakage in Government programs, verify details of individuals who are receiving benefits form Government programs, increase revenue base by using this data to widen tax collection etc. Some use-cases of this platform: Issuing food security cards, property tax collections, police verifications etc. One such use-case has already been tried and is elaborated below:

Data Mining to expand Trade License Tax Base

Any entity which runs a trade, in the geographical limits of GHMC, needs to take a trade license and pay the trade license fee. As per GHMC Act, commercial establishments of about 28 categories need to take trade licenses by submitting building sanctioned plan, occupancy certificate, property tax receipt and lease document in case of rented accommodation. For certain category of trades like hotels, bar and restaurants, they need to show parking area for their customers. The license has to be renewed every year by paying amount every April. The license rates are based on the width of the road on which the trade is situated irrespective of the type of trade. Every entity which applies for a trade license is allotted a number called TIN. TIN stands for Trade Identification Number which is a 12 digit unique number allotted to every Trade License.

That there is evasion of Trade license fee is well known and that voluntary compliance of payment of trade license should be encouraged is well recognized. The license details are as under

Table: Licence Fee Collection

Financial year	Number of Tax payers	Total Trade License fee collected (In Crore)
2012-13	39,563	25.52
2013-14	41,252	25.65
2014-15	51,330	33.89
2015-16	42.835	28.48

It was proposed that GHMC should set up a system centric monitoring, tracking and follow up and use information from external sources for widening and deepening. The most important external data source is that of the tax payers who pay VAT (Value Added Tax) or TOT (Turn Over Tax) in the Sales Tax department. Theoretically all those who pay VAT or TOT should pay Trade license fee also. Accordingly, the list of VAT and TOT tax payers was obtained from Sales Tax department. There are 1,37,512 tax payers who are registered with VAT or TOT. The

IPIH platform was used to match the VAT/TOT data with TIN data based on combination of attributes like name, address. Post the matching and resolution through the system, it was found that only 22,658 tax payers having VAT were having the TIN number paying the Trade License. The balance 1,14,854 persons who are registered VAT or TOT were not registered with Trade license at all. These were notified to the officers in end of April 2016 for taking action. Notices and letters are being issued by the filed officers in phases in last two months.

As a result of this initiative, 110% increase in Trade license collections in first quarter of April to June 2016 over previous quarter was achieved.

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Sustainable e-Government Projects – An approach

K. S. Vijaya Sekhar[1]

Since its formal inception in 2003, the CSI-Nihilent e-Governance Awards (CNEA) has recognised several hundred e-Governance initiatives in the Country (1). As early as in 2004, CNEA emphasised – through institution of an award - that in addition to focusing on year-on-year efforts, the e-Gov practitioners need to pay attention to initiatives, processes and controls that contribute to long term survival and growth of projects. Or, stated differently, to sustainability of projects.

Sustainability in the e-Governance sense may viewed – if not as a state of balance, then at least as a reasonably well managed state of dynamics - where preparedness for future [plans for functionality growth, funding arrangements, ICT enhancements and stakeholder involvement etc] co-exists with focus on the present – the form and number of services, the degree of convenience to citizens etc.

With a view to better understanding the e-Governance initiatives from the point of view of sustainability – and, in fact, with a view to understanding how sustainability itself should be defined and viewed from e-Governance perspective – a detailed study was conducted as part of CSI-Nihilent e-Governance Awards 2011. The study was chaired by Dr. Ashok Agarwal [Adjunct Professor, BITS] and assisted by Prof Sanjiv Vaidya [Professor, IIM Kolkata]. The result of the exercise was published in the CNEA annual compendium of 2011 (2). In order to give a formal shape to such an emphasis on sustainability, CNEA decided in 2010 that past winners of CSI-Nihilent e-Governance awards should be revisited, re-evaluated and re-awarded should such a follow-up action suggest appreciable efforts at sustainability.

Building on this pioneering effort and based on Prof Harish P Iyer's[2] new template, the nominations were received for the years 2013 and 2014. The CNEA-2016 nominees are CNEA award winners of 2011 - invited to submit their nominations using this new template. In addition to describing how their projects had evolved over the five year period from 2011 to 2016, the nominees were required to provide such information as whether the original initiators of the project and the original ICT team continued to be associated – even after five years – with the initiative, and if not, how had the team composition changed over the years, how many times, if so the result on process reengineering, change management, capacity building programs and other enhancements towards technology. The nominees were also required to specify how the functionality had grown and how the ICT components too had kept pace with the changes during a five year period.

It is heartening that this effort resulted in gathering of significant amount of information which helped improve CNEA's understanding of Sustainability in the domain of eGovernance and to following two projects were selected under *Award of Recognition-Sustenance* for this year. The detailed documents of these two projects published in the year 2011 and are available at CSI SIGeGov Website (3).

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Name of the Sustenance Awardees for CNEA 2016:
1. Electronic Payment and Application System of Scholarships (ePASS), Andhra Pradesh
2. Integrated Odisha Treasury Management System (iOTMS), Odisha

(1) Electronic Payment and Application System of Scholarships (ePASS), Andhra Pradesh
Project Description

AP-ePASS is online end to end software application to disburse scholarships to post matric students of Five Departments - Social Welfare, Tribal Welfare, Backward Classes, Economically Backward Classes, Minorities. Even after bifurcation of the State into Andhra Pradesh and Telangana, it is still in operation. Further services relating to other schemes in the departments are added. Eg, pre-matric scholarships, enrolment into Best Available Schools, corporate Colleges, registrations and processing of fees for 'Ambedkar Oversees VidyaNidhi', 'Skill upgardation', 'Giriputrika Kalyana Yojana' etc to name a few.

The ePASS has seen change in leadership at administrative as well as political level. But it adapted to the changes by responding positively and timely to the change requirements. Its ease of use, transparency and resourcefulness endeared to all the stakeholders, primarily to the students. Seminars and Video Conferences for capacity building, awareness building and change requirements have kept the application alive over the years. Several new features are added to the existing application to enhance the performance.

- Integrated to CM Dashboard dynamically
    - Integrated Treasury integrated for online bills process, response files, challans etc.
    - MeeSeva Integration for Caste and Income Certificates retrieval and cross checking
    - 10+2 integration for removal of duplicates, restricting to intermediate colleges, courses and reducing process of colleges registrations as it is already taken care by board in their software
    - SBI eZ pay cards integration through SFTP with SBi for auto generation of cards (with auto sending KYC) and dispatch mechanism automation
    - SMS alerts at every status and Profile password for officers
    - Universities role for colleges confirmation and fee population
    - NPCI integration for UID seeding of bank accounts
    - Banks integration for accounts revalidation through SFTP
    - Corporate colleges (merit upgradation scheme) web counseling (online student registration, merit list generation, allotment etc)
    - In 201-11 there is only one scheme i.e. post-matric scholarships for 5 welfare departments (4). Now 15 schemes with eTaal
    - RASF (Remote Aadhaar Seeding Framework) implemented for UIDs cross checking
    - Pioneer in Bio Metric Authentication of AADHAAR is implemented for authentication with USB scanner, PoS, Mobile, Tablet and IRIS devices
    - Integrated with e Hostels system
    - UID made mandatory and Ration Cards data base linkage

- The application has replicated in Himachal Pradesh (hpepass.cgg.gov.in), Karnataka (karepass.cgg.gov.in), Tripura (tripuraepass.cgg.gov.in) and Jharkhand (ekalyan.cgg.gov.in)

Three reasons of significant improvements are
✓ Integration with Treasury for online bills submission, tracking, rejection etc for ease of monitoring
✓ Caste and Income certificates linkage with source data to avoid unnecessary hardship to the students
✓ Aadhaar services like demography and Bio Metric Authentication to avoid duplicates and leakages

Though the functionality reached its peak in 2010 there are always ways of improvisation and ePASS is no exception. It responded to the field level issues in time.

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(2) Integrated Odisha Treasury Management System (iOTMS)
Project Description
The Integrated Odisha Treasury Management System (iOTMS) is an e-Governance initiative in the realm of Government receipt & payment system. Besides providing a centralized solution for all the 165 Treasuries of the State to conduct their assigned business, the iOTMS has extended a platform for authorization of budgetary provisions among various entities in the State Government. The key features of iOTMS are:
✓ Electronic Receipt system
✓ Electronic disbursement of Government payments
✓ Budget authorisation for Public Works & Treasury drawal
✓ Interface for Drawing & Disbursing Officers
✓ Interface for Reserve Bank of India & Authorized Banks
✓ Interface for A.G (A&E), Odisha
✓ Citizen services such as:
   a) Bill status
   b) Challan query
   c) Pension payment status
   d) Public grievance & feedback
   e) Reports for stakeholders

Finance Department mandated modernizing the finance system through a well planned and phased out strategy. One of the major strategies was to leverage Information and Communication Technology to address the problems. The intention of the State Government to implement the e-governance in Financial Management yielded good result for the State. The efforts of the State Government to achieve

"NIL" balance in Treasury Suspense and contain the expenditure of the State as per the Budget provision using Information Technology was not a mean task.

Without effective leadership support at all levels, it is arguably impossible to achieve the desired goal in any project (5). This was the strategy of the Steering Committee under the leadership of the Additional Chief Secretary Finance Department. The execution of the project was looked in by the Project e-Mission Team under the Director of Treasuries, Odisha which looked into the total operation of the project. Apart from monitoring the implementation of the project in providing infrastructure, maintaining timelines, resolving domain and technical issues and finally ensuring that the objective of the project is realised without compromising the need and comfort of the user.

Capacity Building

A Resource Team was created from the users which provided the users perspective along with the domain knowledge and paved the path for the acceptance of the change. The Master Trainers were the limbs of the project in the field. Responsibilities were not shifted to people with capacity but man power in treasury and other stakeholders accepted the challenge and have developed their capacity to meet the change. The help of technical team is restricted to the development and customization in software. In other words, no data entry operator or computer knowing manpower has been engaged in the Treasuries to operate in the electronic platform. Over the years, this has created a positive dependency on the system and has helped the users to appreciate the benefit of e-Governance.

The electronic receipt and payment model of iOTMS has significantly contributed to the design, functionality of E-Kuber of Reserve Bank of India. States like: West Bengal, Manipur, Tripura, Chhatisgarh, Uttar Pradesh, Tamil Nadu, Rajasthan etc. have taken inputs from iOTMS for development of their electronic receipt and payment system. Similar e-Governance application for electronic receipt & payment processing are used in many of the State Governments such as: Madhya Pradesh, Maharashtra, Delhi, West Bengal, Rajasthan etc.

Two reasons why this application is sustaining is,
- ✓ iOTMS has created a bank neutral platform for electronic receipt of all kinds of State Government taxes and dues. In other States, Revenue Earning Department such as: Commercial Tax Department provide for independent electronic receipt system. In case of iOTMS, the common electronic facility developed can be linked to the backend application of any Department, it also provides scope for electronic receipt of Departments who do not have a backend application.
- ✓ The electronic disbursement of iOTMS uses the RBI platform for Government payments. This has made the system bank neutral and eliminated the possibility of parking of Government funds in Banks. The failed payments are taken back to the Government account in RBI in suspense head till it is settled within a defined timeline. If it is not settled within the timeline, the money is credited back to the consolidated fund as a reduction in expenditure.

Three reasons why the functionality of the project has been improving are
- ✓ 17 (Seventeen) Public & Private Sector Banks are integrated with iOTMS for providing facility for electronic receipt.
- ✓ Due to offline payment facility, in more than 1,000 Bank counters, collection of Government receipts is possible without creation of Treasury or any additional investment in infrastructure.
- ✓ Electronic disbursement directly to 4705930 no. of beneficiaries on the same day on which the advice has been approved.

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Section – III

Projects

Samadhan-An Auto-Escalation enabled Public Grievance Redressal Portal for Uttarakhand
Department of Suraaj, Government of Uttarakhand

Chandresh Kumar and Himanshu Kumar

PROJECT OVERVIEW

The web based program titled as "SAMADHAN" for web-based online Public Grievance Registration and Redressal was launched in Uttarakhand State by Hon'ble Chief Minister on republic day of 2013 as part of Government's initiative towards e-Governance and a step towards implementation of Right to Service Act in the State of Uttarakhand. The project was initiated by Department of Suraaj, Jansewa and Bhrashtachar Unmoolan Government of Uttarakhand and is designed and developed by NIC Uttarakhand. With the introduction of this web-based portal for public grievance/complaint registration, redressal & monitoring, the Uttarakhand Government has assured to address all registered grievances in a time span of maximum 90 days from date of registration of a grievance.

The system has been designed in such a way that a registered grievance automatically gets escalated to next level of officer in the administrative hierarchy, if action is not taken by the concerned officer with-in prescribed time period. This feature makes the grievance system unique in its own. The other main feature of the system is availability of grievance registration and redressal status reports in public domain for social audit purpose. The major functions of the system are:

- Online Registration of Grievance/Complaint by Citizen with facility to upload textual or multimedia contents to supplement the complaint/grievance.
- The online registration is done on the basis of One-Time Code sent through SMS on registered mobile of the applicant to confirm identity of the complainant.
- A grievance can be registered by a citizen to three level of officers in the Government. These three levels are Secretariat (All Principal Secretaries/Secretaries of a department), District (All District Magistrates) and Head of Department (All HODs of various departments). A Citizen has option to submit their grievance/complaint at Directorate/ District/ Secretariat level.
- Login-id/password based access to the portal for officers at different levels.
- Officer has option to
- Accept OR Reject the grievance
- Transfer to other officer, If wrongly submitted by citizen
- Dispose the grievance
- Comments of officer at each stage are mandatory
- Facility to create subordinate officers at district level for enabling electronic forwarding of a complaint.

DASHBOARD of all received, pending and disposed complaints is available on the front page of each of the Government official user area. The summarized

DASHBOARD figures can be drill down to the lowest level to view status details about any complaint/grievance.Main learning has been that in Government sector a computerized system can only a complaint is registered by any citizen it becomes responsibility of the concerned office to either reject it with reason for rejection or dispose it in a time bound manner. The monitoring by top level functionary in the Government also play a pivotal role in effective implementation of such projects. As it is observed that since the time Hon'ble CM have started reviewing this project monthly, disposal rate has increased tremendously.

RESULT INDICATORS

Before implementation of this portal in the State, only district magistrate offices had some system to receive public grievances from citizens of respective districts. These systems were either manual or were computerized system using client /server technology implemented within their office. There was no central repository of total grievances received in the State which can be monitored by top management. All the grievance or complaints are now available in public domain on internet which ensures fast redressal of registered complaints.The grievances which are received manually at district office are also entered into the SAMADHAN portal by the district administration official. Once a manually received grievance is entered into SAMADHAN portal, the complainant can view its current status through internet by entering the unique complaint/grievance-id.

Key Performance

G2C and G2G services are being provided through this portal by using ICT.

Benefits obtained from these services by each category of stakeholders

Each complaint is assigned to senior officers of the concerned department/ or the nodal officer deputed for disposal. Chief Minister himself reviews the selected and long pending complaints on regular basis(monthly) which enforce involvement of officers and department staff to utilizing the online system for public grievance redressal. Any citizen, who registers complaint in "Samadhan", gets prompt reply from the department, encouraging them to use it for their grievance redressal.

Table: Year-wise wise transaction volumes

Year	Complaints Received	Complaints Disposed	Complaints Rejected	Complaints Pending
2013-14	2313	1634	644	35
2014-15	2269	1725	475	69
2015-16	5849	4246	1275	328

Implementation coverage

Since this portal is web based, it is accessible from anywhere where internet connection is available. For speedy redressal of the grievances effectively, a separate interface has been developed and implemented for CM Office and the nodal department (Department of Suraaj & Bhrashtachar Unmoolan, Government of Uttarakhand). This interface has access to all the registered complaints in the State and using this interface the CM office flags some of the long pending complaints and forwards it to concerned officer for their remarks. The flagged complaints/grievances are selected for hearing by Hon'ble Chief Minister of

Uttarakhand who takes meeting of all the officers of Uttarakhand Government on video conference on every third Thursday of a month. The complainants of flagged complaints are also invited to attend this meeting in their respective places in video conference studios. The monthly meeting and regular monitoring by Hon'ble CM on SAMADHAN portal ensures effective implementation of the project in the State. Emphasis is also given on quality of the disposal of a complaint/grievance by concerned official. Facility of disposing complaints has been extended to district level officers so that complaint can be addressed faster.

There is no. of grievances/complaints from citizens mainly from rural background which are received manually /hand written at District Magistrate Offices or at CM Office. These papers written grievances are entered into the SAMADHAN portal by District administration for effective disposal and monitoring. Also the grievances which are addressed to District Magistrate office earlier used to move manually within district to the concerned officer. Now, facility of disposing grievance has been extended to around 700District Level Officers in all 13 districts of the state so that manual correspondence regarding grievance can be reduced within district and grievance can be disposed early.

Outcomes in terms of Efficiency, Improvements and integration
Before this system came into existence, complaint used to travel manually from one officer to another, which was time taking and grievances could not be redressed timely and efficiently. Now grievances travel electronically which resulted in faster redressal. There is not much cost involved in implementation of this project due to being a web-based solution. The hosting of this portal is presently done on shared servers of NIC Uttarakhand web infrastructure. The software design and development is done in-house by NIC officials therefore no extra cost is incurred in developing this system. Moreover, as the system is internet based, any government office/department willing to use the public grievance system require only a client computer and internet connection. For maintenance of application software and other O & M activities, one Programmer is hired by nodal department to get various types of reports developed from time to time. Also this manpower is used for imparting training on application software to new users of the system.

Specific innovative ideas implemented in e-Gov area and their impact on services
It is the only portal implemented in the State of Uttarakhand which is not confined or limited to any particular department or office of Government of Uttarakhand. A grievance or a complaint of a citizen related to any of the around 130 government department, all the 13 district administration and State secretariat can be online filed using this portal. The applicant has option to upload multi-media contents (picture, scanned document or a video) along with textual description to supplement the complaint. A unique complaint/grievance ID is allotted to the complainant for future reference of the complaint/grievance. SMS and email alerts are sent to the complainant on registration of complaint/grievance and whenever any action is taken by the concerned officer auto alerts are sent on registered mobile number and email address of the complainant. All the Principal Secretaries/Secretaries, District magistrates, Head of all the Government Departments and Universities have been provided a unique user-id and password to access the portal for disposal of the

registered grievances/complaints in their respective offices. A very comprehensive user specific DASHBOARD is displayed on logging-in into the portal by any officer. The summarised figures about registered/pending/disposed/escalated grievances displayed on the DASHBOARD can be drilled down to see the details about a particular complaint/grievance.

There is a separate interface on SAMADHAN portal for CM Office and the nodal department which is Department of Suraaj & BhrashtacharUnmoolan and Jansewa, Government of Uttarakhand. This interface has access to all the registered complaints in the State and using this interface the CM office flags some of the long pending complaints and forwards it to concerned officer for their remarks. The flagged complaints/grievances are selected for hearing by Hon'ble Chief Minister of Uttarakhand who takes meeting of all the officers of Uttarakhand Government on video conference on every third Thursday of a month. The complainants of flagged complaints are also invited to attend this meeting in their respective places in video conference studios. The monthly meeting and regular monitoring by Hon'ble CM on SAMADHAN portal ensures effective implementation of the project in the State. Emphasis is also given on quality of the disposal of a complaint/grievance by concerned official.

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems
A separate module has been implemented to capture details of complaints registered in Central Governments CPGRAMS portal which are related to Uttarakhand State. Complainant can check status of complaint on Samadhan Portal.

ENABLER INDICATORS
Process reengineering
Before existence of this portal, every department had its own mechanism to address the public grievances received in their offices. Every department had separate grievance cell to address their department specific grievances/complaints. Most of the grievance cells were manual and only some were using stand alone computerized system which was confined to their offices only. There was a requirement of separate and manned grievance cell/unit in each of the office to register manually received paper based grievances/complaints into the system. Therefore there were possibilities of manipulation in registering the grievance/complaint. After implementation of this central web-based public grievance system, performance of any department can be seen just by viewing the web-based analytical reports. To effectively monitor the grievances, nodal officer from each department/office has been deputed and provided user id for monitoring and taking action on grievances. There was no mechanism for CM office or other senior level officer to check how many public grievances are registered or disposed.

Challenges faced in implementing Process changes
As per work-flow of the SAMADHAN project, a complainant can online register his/her complaint/grievance and address it to any of the officer of level from Secretary, District Magistrate or Head of the Department. This required training of all senior officers in the State before implementation of the SAMADHAN project.

Therefore a series of workshops, seminars and training programs were organized before the start of implementation. There were apprehensions from some of the senior level officers about failure of the project due to its being a web-based program. All the reports about registered grievance/complaints and their disposal status are in public domain, therefore there was a fear of social pressure among some officers in implementing such portal in the State. Technically, the project required at-least one computer system and a internet connection in each of the office to access this portal on daily basis. Though this was not a big problem as in most of the Secretariat and District level offices internet connectivity is available over SWAN (State Wide Area Network). However, offices of the HOD level had to ensure availability of this minimum infrastructure in their offices.

The Lessons learnt from the Process re-engineering exercise
Following are the key learnings in the process re-engineering exercise:
- There has to be a driving force/nodal department, which in this project is Department of Suraaj, JanSewa and BhrashtacharUnmoolan, GOUK, for implementing this kind of project in the State.
- There should be defined time period for completing a task. In this case the GoUK assured to address any complaint/grievance with-in 90 days of its registration.
- Time wise responsibilities were fixed by GoUK to dispose a complaint within a stipulated time period after which the system automatically escalates the grievance to the next officer in the hierarchy.

Best practices adopted from the industry/ other State implementations
Software has been developed as per standard prevailed in industry and is security audited passed through empanelled agency of Department of IT (GOI). Database has also been optimised for getting best results.

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
Senior officers from department have been very enthusiastic about this system since beginning; they have helped in every aspect in evolvement of this system. Now Chief Minister himself involved by directly taking feedbacks from officers and talking to complainants.

Change management and Capacity building strategy
Complaints monitoring system is a transparent system open to public. Complaints automatically escalate to higher officials if it has not been disposed by concerned officer in time. Complaints are also being monitored by Chief Minister of State himself once in a month, thereby driving officers to dispose the complaints at the earliest, which sends positive picture of the government in the public.

Project management & Monitoring
Monitoring of the project is done by top bureaucracy and management of Government of Uttarakhand. On every third Thursday of a month by Hon'ble CM of Uttarakhand takes meeting of all Principal Secretaries /Secretaries, District Magistrate and HODs over video conference to review the monthly progress and

status of grievance redressal. This regular meeting ensures effective implementation of the project in the State. The project is widely publicized in print and electronic media by GoUK to encourage citizens of Uttarakhand to use this system for their grievances.

Financial model adopted
Project is a self financed initiative for the department. However overall cost of the project has been very less for the department due to involvement of National Informatics Centre (NIC) in design, development of the system and providing Data Center Services. However, for maintenance of application software one Programmer is hired by nodal department to get various types of reports developed from time to time. Also this manpower is used for imparting training on application software to new users of the system.

Special efforts to ensure sustainability of the e-Governance initiative(s)
Due to nominal cost of implementation and constant monitoring from senior officers in the department this system is running smoothly for last 3.5 years. Any good suggestion from anyone is taken care of and implemented if found feasible.

Challenges faced in transition
There is always resistance to changes in every system, but fortunately after a number of workshops, department officers adopted this system well.

Technology
Technological solution adopted
Web based portal is designed, developed and hosted by NIC. It is developed in Microsoft's Dot Net Framework and SQL Server as database.

Compliance of the Technology adopted with e-Government standards
Website is security audited passed through empanelled agency of Department of IT (GOI).Software is UNICODE enabled for Hindi language, as most of the consumers know only Hindi language in the Uttarakhand.

Strategy for Disaster Recovery and service continuity
Application is hosted at Data Centre in NIC Uttarakhand State Unit and with 24X7 services availability. Application and Database is backed up as per NIC policy.

Impact and value-addition thru adaption of Social media
Government has advertised this scheme at the time of launch through pamphlets, brochures and print media. Also it has been prominently displayed in various important government websites.
No major technology related challenges have been faced. If any, they are taken care of by NIC.

The Lessons learnt from Technology choices and implementation strategy
To access this portal internet connection is required; therefore citizens who do not have access to net, cannot directly lodge the grievance in this portal. Alternatively

they can contact grievance cell in their district to lodge the complaint, once complaint is lodged they can be informed of the status on their mobile phones.

VALUE INDICATORS
Digital Inclusion
This is a web portal which is accessible from anywhere, however there is complaint cell in each district which assists citizens in lodging their complaints in Samadhan Portal. Project is UNICODE enabled for Hindi language, as most of the citizens know only Hindi language in the Uttarakhand.

Green e-Governance
Instead of movement of grievances manually, now they move electronically thereby reducing the consumption of paper.

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Citizen Centric Services under the Portal e-Cooperatives
Department of Cooperation, Government of Madhya Pradesh

Sanjay Mohan Bhatnagar and A. N. Siddiqui

PROJECT OVERVIEW

e-Cooperatives portal is 24x7 web based application design, developed and commissioning by National Informatics Centre, Madhya Pradesh on behalf of Department of Cooperation, O/o Registrar Cooperative Societies, Govt. of Madhya Pradesh. Application is Unicode complaint with 40000+ cooperative societies (having more than 1 crore members) logins on portal with 6000+ online users at a time. Apart from that, 113 logins for various offices and 2000+ login for department employees. It is unique and first kind of IT Initiative in Cooperative Sector in the Country developed by NIC after going through requirement gathering and identified various services offered by department. Various G2C, G2G and G2E services are provided through this portal. It has a number of workflow based systems, easy to customize, secured logins, role based functionality, audit trail, SMS gateway integration, common user interface/selection based and integration of all functionalities at single platform. The application has been designed keeping in view the provisions of the M.P. Cooperative Societies Act, 1960 and M.P. State Cooperative societies Rules, 1962. Application is useful in terms of being more efficient, transparent and offers faster delivery of services at no costs. The salient features of the project are:

- Online application for registration of cooperative societies (Work flow based system) with online application receipt generation (End to End)
- Information about individual societies disseminated to common citizen by mobile app/web.
- Common Citizen Registration of particular information of Societies
- Online application for empanelment of Chartered accountant and online empanelment process (End to End), Status check through MP Mobile/Web.
- Accounting Loan under interest subvention scheme for short term agriculture loan being distributed by PACS at 0% interest rates, SMS to farmer regarding this information.
- Submission of Cooperative Societies statutory reports within timeline as per the M.P. Cooperative Act 1960.
- Housing Societies Complaint monitoring and complaint redressal system
- Court Cases Monitoring System, Public interface for Cause list, hearing dates

Citizen Centric Services Enhancements

- Work Flow Based System for Registration of a Co-operative Society
- Society basic information dissemination
- Statutory Data Uploaded by Societies
- Public Registration for Societies information
- Work Flow Based CA Empanelment
- Work Flow Based Housing Societies Complaint Monitoring System
- Court Cases Monitoring System, Public interface for Cause list, hearing dates
- Interest Subvention for Short Term Agriculture Loan

Key Learnings

- Output of the project indicates the need to expand the coverage and expedite the implementation of e-Cooperatives. Overall, in all three types of services (G2G, G2C & G2E), the number of trips to officers at head office is completely eliminated after computerization. Waiting time has been reduced by 30-50 (in some cases 80) percent by computerization. Perceptions of quality of services and quality of governance show an improvement in project. Direct cost savings to citizens averaged from 30 to 50 percentage across all states. User participation in the design of the delivery system prior to its implementation is extremely important.

- One of the possible reasons for the number of trips reduced at significant level is to have cut down the number of supporting documents that are required to avail a service. There has to be a balance between ensuring that a system prevents fraudulent transactions and the burden that extensive checks can place on people are honest, Often information about the required documents for registration of the society is not publicized well. Users need to make a trip to the department just to determine the requirements. Sometimes users make unnecessary trips as they find that on a given day their work will not get done because of long queues. This is because the capacity to process a service request and the demand for service may not match on many days. So while implementation of the project modules, a proper care has been taken by the department in that area.

- For Capacity building groups should be formed depending upon the skill set of the officials.

RESULT INDICATORS
Key Performance

- *Work Flow Based System for Registration of a Co-operative Society*: (Visits of the citizen t the office reduced, Status Tracking, Time and money Saved, Transparency)

- *Society basic information dissemination:* One can see the information on web, through Mobile App

- *Statutory Data Uploaded by Societies:* Information compliance as per M.P Cooperative Act 1960 and Rule 1962

- *Public Registration for Societies information*: Any citizen /public representative can watch the society(ies) Statutory Data

- *Work Flow Based CA Empanelment*: Hassle free empanelment of Chartered Accountant

- *Work Flow Based Housing Societies Complaint Monitoring System*: End to End Process, Online and Offline complaint registration

- *Court Cases Monitoring System, Public interface for Cause list, hearing dates*: Registration of Cases in Tribunal, HO, Division and District, Monitoring of Cases.

- Loan Account Management to Farmer under Interest Subvention Programme (Zero percent Interest)

Table: Year-wise wise transaction volumes for various services

Sl. No.	Name of Service	No. of Transactions		
		2013-14	2014-15	2015-16
1	Registration of a Co-operative Society	116	104	146
2	Statutory Data Uploaded by Societies	–	–	38200
3	Work Flow Based CA Empanelment	–	–	385
4	Work Flow Based Housing Societies Complaint Monitoring System	–	–	226
5	Court Cases Monitoring System, Public interface for Cause list, hearing dates	–	–	2379
6	Loan Account Management to Farmer under Interest Subvention Programme (Zero percent Interest)	–	–	5952520

Implementation coverage
Stakeholders
- Citizens
- Over 15 Million members are associated with the Cooperative Societies
- Department of Cooperation
- Over 2000 Employees are working in the department of Cooperation, M.P
- Department of Food and Civil Supplies
- About 21000 FPS are associated with Cooperative Societies
- Agriculture Department
- Societies
- NIC
- Researcher/Scholars
- NGOs

Coverage of the Project
- Department Of Cooperation, Head office
- 20 Sections of Department of Cooperation Madhya Pradesh
- All 10 Divisional offices
- All 50 districts offices
- Apex Bank & 38 DCCBs (District Central Credit Cooperative Banks)
- 40000+ Cooperative Societies
- operative Court Case Management System

New Services Added
- Statutory Data Uploaded by Societies
- Public Registration for Societies information
- Work Flow Based CA Empanelment
- Work Flow Based Housing Societies Complaint Monitoring System
- Court Cases Monitoring System, Public interface for Cause list, hearing dates

Enhancements made to the existing Services
- Work Flow Based System for Registration of a Co-operative Society End to End Society Registration
- Society basic information dissemination MP Mobile App Services has been added

Following are the description of the new services:

Online Society Registration
- Online Application for New Society Registration
- User Authentication by mobile
- Receipt Generation
  - Officer Name
  - Postal Address ,Contact details and Appointment Time
- Appointment of Organiser by OIC/Upload Prativedan by Organiser
- Approval /Rejection and objection
- Letter issued if rejected
- Certificate Upload if approved
- Status tracking by applicant
- SMS Alert at every stage sent to applicant

Society basic information dissemination
- Society Name, Address, Last AGM, Society registration number, registration date etc. information available to common citizen
- Basic information also available on Mobile App

Statutory Data Upload by Societies
- AGM Notice/Proceeding
- Member List
- Balance Sheet
- Audit/Fees/Status/Complaint
- Report/Compliance Report/Inspection Report

Public Registration for Societies information
- One can register for single society/multiple societies information through portal
- OTP sent to the user mobile number
- After successful registration one can select single/multiple societies
- Each time SMS sent to registered mobile user when
- a particular society update the information at portal
- Registered user can also view detailed report of the society/societies after login to portal

CA Empanelment
- In this module, CA whose headquarter is in Madhya Pradesh can apply online for auditing of the cooperative societies of Madhya Pradesh
- Three type of applicants Partnership Firm/Proprietary Firm/Individual Practicing F.C.A.

- For applying, the CA has to fulfill some criteria in accordance to their firm which is calculated by the system
- User get acknowledgement after filling up the form.
- The department has the rights to approve or reject the application. Under Section 58(1)(a) and (b) of M.P. Cooperative Societies Act,1960
- SMS alert to the applicant.

Work Flow Based Housing Societies Complaint Monitoring System
- Complaints originated at different levels i.e Citizens, District office, Divisional Office, HQ and Vallabh Bhawan
- Meeting organized on the complaints at HQ and Divisional Office for issuing instructions or complaints disposed
- Complaints forwarded to concerned offices
- Action taken by concerned office and informed to complainant
- SMS Alerts at every stage to Complainant /officials concerned
- Status Tracking by Complainant
- Monitoring Reports at each level

Court Cases Monitoring System
- Monitoring of the Cases in Tribunal, HO, Division and District
- Various types of Cases are registered in various sections
- Case details updated including Hearing Dates are entered/updated
- Stages of the cases are updated
- Information regarding court case cause list (Category – wise) and hearing dates available to common citizen at one click

Outcomes in terms of Efficiency, Improvements and integration
Green e-Governance is about application of Green computing practices to the domain of e-Governance. It involves adoption of environmentally friendly practices with respect to creation, use, and disposal of ICT facilities. There are several dimensions to green e-Governance and prominent among these relate to Power and Paper consumption, and disposal of e-Waste.

- Statutory Data Upload from Societies
- Paperless dissemination of departmental Letters /Circulars using application.
- SMS alert to the user through SMS Gateway does not require telephonic or postal services
- Paperless monthly progress reports
- Paperless record keeping
- No need of conveyance for new society registration, use online registration system

Now with the facility of capturing data online coupled with introduction of process re-engineering, the traditional system has been done away with and the mandate has been issued to allow only for online data without any backup through email or hard copy. This has ensured not only resource mobilization but also prompted decision making at the earliest on the issues which are supported by huge data for better and effective data analysis.

Specific innovative ideas implemented
- M.P. is the first state to use this kind of system where societies have the facility of submitting the statutory documents to the Registrar online.
- Service Delivery through M.P. Mobile App

The extent of integration
- The system has an interface with the e-Uparjan 'An application of the Department of Food, Civil Supplies and Consumer Protection through Web Services
- Several web services has been created for M.P Mobile Application Citizen Services
- Daily Transaction counts in e-Taal website through web service

ENABLER INDICATORS

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
- First ever initiative in the Cooperation sector
- IT Cell of the department is continuously working hard to automate all the functions of the department

Change management and Capacity building
Regular sessions are conducted for the staff of all the level with regard to the added features to the feedback for Process re engineering or smoothening the workflow management. Initially we had the experience that some people are more tech savvy while other have a little knowledge of ICT, it was thought that in order to bring about the desired result, training batches should be categorized

Project management & Monitoring
- Exceptions Reports at Principal Secretary and Registrar Cooperation Level
- Monthly Video Conferencing to all offices in M.P

Financial model adopted
- Domain expertise with the department having technical support with NIC, M.P.
- Operational cost managed by IT Fund of the department
- Data is hosted and managed by NIC Data Centre

Special efforts to ensure sustainability of the e-Governance initiative(s)
- The entire infrastructure is hosted at NIC Data Centre
- Services offered by the Government so Revenue generation is not the aim

Challenges faced in transition
- Data is unstructured
- Several modes of operations (head office, division office, district office, Apex Bank ,DCCB)
- Unwillingness of the user to change the system

- Delay in information gathering and dissemination
- Less computer savvy staff
- No transparency in the system
- Inconsistency in the data
- Integration with other systems
- Technology Migration issues
- Training to old age staff is difficult

The Lessons learnt from Change Management and Capacity building
- Training should be as per the skill set
- Master trainer should be identified an trained

Technology
Technological solution adopted: Proto Type Methodology adopted
Compliance of the Technology adopted
- Coding and documentation standards have been followed
- The application security audit cleared

Strategy for Disaster Recovery and service: DR Centre at NIC Hyderabad

Impact and value-addition thru adaption of Social media
- Face book, Twitter Account have been created
- Results in publicity of the project

Technology related challenges
Handshaking with other system is tough as the unwillingness of the owner of the system

The Lessons learnt from Technology choices and implementation strategy
We could have done in a more generic and better way if could have got a sufficient time. Most of the time pressure is to deliver the solutions earliest

VALUE INDICATORS
Digital Inclusion
Farmers and Non tech savvy person are not getting full benefit of this service .The following step are taken
- We are trying to provide SMS and Mobile based services to penetrate this segment of the users.
- Training sessions

Green e-Governance
- Paperless dissemination of departmental Letters /Circulars using application.
- SMS alert to the user through SMS Gateway does not require telephonic or postal services
- Paperless monthly progress reports
- Paperless record keeping

- No need of conveyance for new society registration, use online registration system.

A very good practice of process re-engineering was inducted in collecting data for monthly VC, held on first Saturday of every month. Earlier the data for more than 20 subjects scattered over a large number of columns was collected either offline or through email from 110 offices, and reports prepared manually. This made it highly time consuming and resource crunching. Now with the facility of capturing data online coupled with introduction of process re-engineering, the traditional system has been done away with and the mandate has been issued to allow only for online data without any backup through email or hard copy. This has ensured not only resource mobilization but also prompted decision making at the earliest on the issues which are supported by huge data for better and effective data analysis.

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e-Agriculture Scheme Monitoring System
Department of Agriculture, Government of Bihar

Himanshu Kumar Rai and Ashwini Kumar

PROJECT OVERVIEW

The e-Agriculture Scheme Monitoring Information System (e-ASMIS) demonstrates the transformative impact of e-Governance on programme implementation, monitoring and decision making by Government. The department is working towards continuous improvement of the status of agriculture and the human resources engaged in this sector in all 38 Districts and 534 Development Blocks/ Revenue Anchals in the state of Bihar. Department is working towards implementation of various state and central funded schemes. Apart from providing benefits under various schemes, department monitors the registration and performance of dealers providing agricultural inputs, maintain quality of agricultural inputs and monitor training, research & exposure activities in the state. Implementing the wide range of activities mentioned above and their proper monitoring across widespread geographical coverage of the department has always been a tedious task for the department.

The major problems being faced were:

- Lack of Proper Communication channel for stakeholders- Department was unable to update the information on day to day activities and issue instructions to its field level officers on time. Also there was no any centralised platform for the stakeholders like farmers, manufacturers & dealers for agricultural inputs from where they can get access to the information regarding the schemes being catered by the department.

- Information Gap in Subsidy Sanction: There was no systematic procedure to monitor the progress of subsidy sanction under various schemes in the State. Department was dependent on the report received from district offices over phone and email and there was lack of consistency in such reporting and the information received was outdated since there were many implementation nodes at block and panchayat level in each District.

- Delay in Reconciliation: The post data entry (data entry done many days after the transactions took place) after the implementation of schemes from the sanction register maintained at district level and reconciliations was done at district level and state level. As a result the data comes after a particular season ends which meant that very little or no corrective action can be taken. The entire post data entry process was an exercise without much outcome.

The objective of the e-ASMIS project is to monitor and create a data repository of all the schemes and their beneficiaries under Agriculture Department till Panchayat Level. The system facilitates proper monitoring of the activities and programs in order to ensure that the data collected from the blocks, districts and state level, is compiled and reported with speed and accuracy, to produce reports presenting a clear picture at the grass root level. It gives an aggregated, consolidated output which allows two-way communication of information flow.

Overall approach to the project achievements with reference to plan, current status and the deviations from plan may be provided. Specific information with regard to

ICT interventions/Initiatives undertaken during the last two years to be presented. Nominee is also requested to briefly present one or two key leanings from the life cycle management of the project deployed, for the benefit of e-Governance practitioners / researchers.

Agriculture Department provides subsidy benefits to the farmers under various schemes. Earlier the application by farmers were being received offline at the panchayat level (AC/KS) and Block level (BAO) and after processing, it was sent to DAO for final approval and sanction. This offline process was time taking and the farmers have to fill all the details in multiple different types of Form for various schemes. There was no any centralized medium in place for the higher authorities to monitor the number of applications received and their relevant status. The project was started with a plan to automate the registration and subsidy sanction process for the farmers in the state. Automation of Licensing, Quality Control, employee management and scheme management were added along with this.

The project was started in Nov 2013 after the finalization of open tendering process in the month of October. The project was made live in Feb 2014 as per the plan. Various rounds of training and handholding sessions were organized by the department in coordination with the implementation partner to implement and roll out the project state-wide. To ensure the proper implementation of the project and enhance its penetration level to the stakeholders, module wise roll out approach was taken by the department. The modules which were initially targeted were Employee Profile, Quality Control, Training Module, Scheme Monitoring & Reporting. The scheme monitoring & reporting module was successfully used in April- May 2014 for schemes like Sarjameen Seva and Crop Cutting. The complete reporting of these schemes was done through the system till Sep 2014. As a next step the modules such as Farmer Registration and Licensing were targeted which had the largest stakeholder inclusiveness. Both these modules started receiving transactional data from Dec 2014 after its state-wide rollout. After this the system is being running with these modules and the department is targeting to roll-out the complete sanctioning process of all the schemes across the state. After Dec 2014, the Farmer Registration and Licensing module was launched across the state. Various training sessions were organised for the officers to make them well acquainted with the system. The department encouraged the farmers to register online through advertisements. The manufacturers/dealers were issued order to use the online system. In May 2015, a major initiative was taken to integrate this portal with the department's official website so as to disseminate and update information through this platform also. After more than a year of successful roll-out and receiving lakhs of Farmer's data, a major initiative was taken in May 2016 to do the online verification of Farmers so as to ensure a second level of authentication of the data available with the department. As of now the system is helping the department in managing its day to day information dissemination process and expanding its reach to the stakeholders.

Key learnings from the life cycle management of the project are:

- Proper training, handholding and mass awareness are the major steps which are required for the successful implementation of any IT project.
- Maximum stakeholder inclusiveness and participation needs to be ensured during the requirement gathering and development phase of the project to reduce change and repeat development work.
- Centralized IT support and helpdesk is one of the major requirement for successful implementation
- IT infrastructure and support system needs to be inbuilt at the field level to ensure proper operationalization.

RESULT INDICATORS

Key Performance

Services being offered by the project are:

- Govt-to-Citizen
- Govt to Business

Benefits obtained from these services

For the Beneficiaries (G2C)

- Single ID to access all the schemes and programmes catered by the department.
- Facility to know about the status of the application thus the efficiency of the system will increase
- The system saves the time and effort of the farmers in accessing the benefits provided by different state and central government schemes.

For the Department(G2B)

- Bringing Transparency to the system
- Increased through put by proper monitoring the progress done by field level officials and intimating them about their performance.
- Effective use of ICT for faster delivery of reports to control unnecessary requisitions and misuse of reports. The data is coming from the grass root level are compiled by the system to generate various MIS reports.
- Increasing security as authentic users can only enter the data.
- Standardization of all employee data through HRMS Module
- Transparency in Licensing Process by introducing online mechanism of applying and approval of license applied.
- Yearly Target data for different schemes entered in system by all district and department officials
- Various analytical and graphical reports are generated for department users to check health of schemes implemented.
- Inclusiveness of other stakeholders like manufacturers/dealers into the system to get updated data from them.

Year-wise wise transaction volumes for various services

Table: Transaction Volume

Name of Service	Volume of Transactions (Nos)			
	Apr'16– Aug'16	Apr'15 – Mar'16	Apr'14 – Mar'15	Apr'13 – Mar'14
Beneficiary Registration	2,90,696	11,39,194	4,10,824	NA
Subsidy Application	43,886	2,60,883	1,54,695	NA
Licensing	6,961	7,959	8,956	NA
Farmers Verification	8,78,992	NA	NA	NA

Implementation coverage

The services offered under this application extend to each and every farmer in the state. It has been developed with a view to create a centralized and authenticated database of all the farmers all in the state. The department has aimed to create this centralized repository in order to use it as a mechanism to disseminate information to all its beneficiaries. The system has been started as an online reporting tool for the field level officers and with time it has graduated into a complete MIS tool and a public platform for all the stakeholders of the department. The stakeholders in the e-ASMIS system include Department of Agriculture, head quarter officials of DOA, field level officials of DOA, Farmers, Vendor/Suppliers, Directorates, State/Central govt. agencies and Citizens. The services being offered to various stakeholders are:

- More than 1 Crore farmers- Can register online and apply for subsidy under various schemes
- Department Officials at HQ- Access the reporting tool for decision making purpose, Access Licensing module for managing state level licenses, Access HRMS module to update employee information data.
- District Agriculture Officers of 38 districts- Access modules like Licensing, Quality Control and Scheme Monitoring to manage these activities and report the status to the higher authorities. Subsidy Application are also being sanctioned by this level of users.
- Block Agriculture Officer in 534 blocks- Access the 'Apply Subsidy' module to check the subsidy applications approved by Panchayat level officers and send recommendation to DAO for final sanction through the online system.
- Agriculture Coordinators and Kishan Salahkar in more than 8500 Panchayats. They access the system for approving the subsidy applications and verifying the farmers registered in their jurisdiction.
- Other stakeholders including SAO in 101 sub divisions and JDAs in 9 divisions can access the system for few modules such as Licensing and HRMS.

The system has been made live in February 2014 and after its implementation few new services have been added such as:

- Integration with department official website to publish updated contents.
- Facility to provide to updated verification details of the farmers.

As per the plan yet, there is no any scope enhancements planned for the system. The department has targeted to roll-out each and every Agriculture scheme being running into the state through the system to completely remove the dependency on the manual system and ensure maximised transparency and efficiency.

Outcomes in terms of Efficiency, Improvements and integration

With the introduction of the online system for subsidy application and processing, there has been an overall 50% reduction in the time taken for processing the application. The task of post data entry has been eliminated altogether. This has saved time, cost & effort of the data entry which was being done earlier. It has resulted in quite a bit of savings for the stakeholders. The details of the sanction, done at panchayat level, are being captured and consolidated at block and district level (through an MIS report). It may be noted that this reconciliation process was never being completed before the close of the particular season prior to this initiative. The beneficiary and subsidy sanction figures that are available to the department almost on real time basis are being used to allocate new targets. Analysis reports of application received, verified, pending and approved at different levels are being used to monitor each level official and take action in advance against probable defaulters.

Specific innovative ideas implemented

The software was developed to use data to generate various kinds of MIS reports (both at the State & District level) for tracking and monitoring subsidy sanction and other activities of the department. One of the major advantages of e-ASMIS system is its ubiquitous availability and ease of use by stakeholders, e-ASMIS worked on the ideology that the less is the extent of re-engineering of the government processes, the more and faster was the acceptance. With the introduction of the online system for subsidy application and processing, there has been an overall 50% reduction in the time taken for processing the application. For the ease of the beneficiaries, a Common Application Form has been designed for all schemes and the Farmers have been provided the facility to apply for the benefits with minimum effort. The application is now received instantly in the AC/KS login who is the first level Action Taking Authority. Further, the application is sent online for recommendation to BAO and DAO for final approval. The task of post data entry has been eliminated altogether. This has saved time, cost & effort of the data entry which was being done earlier. It has resulted in quite a bit of savings for the stakeholders. The details of the sanction, done at Panchayat level, are being captured and consolidated at block and district level (through an MIS report). It may be noted that this reconciliation process was never being completed before the close of the particular season prior to this initiative.

The extent of integration

The application has been integrated with the departmental website for dissemination of regular updates regarding tenders, notifications, news, announcements, allotment details and other important information to be published in public portal.

ENABLER INDICATORS

Process reengineering

The system has re-engineered three major processes of the department which include Registration of Beneficiaries, Application for Subsidy under various schemes and Issue License:

- Registration of Beneficiaries: Earlier the registration is being done every time the farmer is receiving benefit under a scheme creating a redundant data of farmers with the department. The new system introduced the concept of one-time online registration and a unique ID was provided to the farmers to access benefits under all the schemes as per their eligibility. This unique ID can be used by the farmers to enrol themselves for any kind of benefit provided by the department.

- Application for Subsidy: The earlier offline process of subsidy application was fraught with loopholes and lack of transparency depriving many deserving farmers from the benefits. The new system allowed farmers to register for subsidy under any scheme online with the help of unique ID allotted to them. The system also facilitated a Common Application Form (CAF) for all types of schemes catered by the department. This ensured transparency, faster processing, avoiding duplication and in turn saving farmers a lot of hassles.

- Issue License: Agriculture Department issues license to the manufacturing and marketing companies for production and sale of seed, fertilizer, and pesticides across the state. In the earlier system, the application was sent through courier or by hand to the licensing authority and there was no tracking of the time taken in issuing of the licenses. The process of license issue was delayed due to many reasons like lack of proper documents submitted by the applicant, incomplete information etc. The new system introduced online application process for the licenses in the prescribed format as per the schedule defined by the department and the system generated license is being issued after verification and approval at multiple levels. The time taken by approving authority at each and every stage is tracked and the same information is available to the applicant. The applicant can also track the status of its license. System generates a flag one month before the license expiry date so that the same can be renewed well before time

Challenges faced in implementing

- Lack of awareness about the new process among the stakeholders
- Resistance towards adopting the new methods
- Unavailability of IT Infrastructure support in field level offices at few places.
- Regular training and capacity building was required

The Lessons learnt from the Process re-engineering

- Proper training, handholding and mass awareness are the major steps which are required for the successful implementation of any IT project.

- Device a mechanism to automate the system with minimum change in the existing functional process to increase its acceptability among the stakeholders.
- The new process introduced should be user friendly.

Best practices adopted

The successful functioning of a system is dependent on understanding the underlying processes which runs the department's objective of and analyzing the hidden paraphernalia which makes it work. e-ASMIS satisfies these issues by identifying the entire workflow of the department along with its hierarchical details and configuring the same into the system. This ensures participation of all the hierarchical members thereby improving service delivery. e-ASMIS has been designed with a scalable architecture with the intention to configure it to as many levels as possible, keeping the basic engine and its operation in place. Software scalability of the project was established by making the system web based with web browser the only visual interface which resulted in more and more number of users coming into the system.

Leadership, Change Management, Capacity Building during transition

The system has been implemented successfully with the help of leadership team of the department. The major support/directions being issued are:
- Advertisement in print media to encourage farmers for online registration and subsidy application
- Issue order to the manufacturers/dealers to use the online system to apply and renew their licenses.
- Deployment of experienced data entry operators and executive assistants at district and blocks for operationalization of the project.
- Deployment of PMU at the HQ level to act as a support in implementation and smooth functioning of the application.

Change management and Capacity building strategy

The change management in the application is being managed by the implementing partner. Any suggestion received from the stakeholders of the system is first vetted by the team identified by the department including IT personnel and higher authorities and then it is being sent to the implementing agency for execution.

To implement such an innovative application, proper training and capacity building plan was needed. To achieve proper training, various onsite trainings were organised for the state level and district level users. Separate training sessions were organised for the users who were supposed to use a particular module like licensing, subsidy application and Quality Control. User manuals in Hindi and English were developed and were used in training. Proper training sessions were arranged for all nodal officers including Deputy Directors, Assistant Directors, and Section Officers (involved in licensing process) at State HQ subsequently to improve the application. Individual level trainings were provided to the chief nodal officers of the department. The training sessions were organized at the Central Soil Testing Laboratory which is responsible for handling the sampling and testing activities all

over the state. The officers, lab assistants and coordinators were trained for using the Quality Control module. The training sessions organised for districts were divided into various batches as the number of users were quite high. District Agriculture Officers from each district along with their data entry operators were provided training and User Manuals for all the modules to be used by them were provided also. Agriculture Coordinators/Kishan Salahkaars(two from each district) from the districts were also trained on the farmer registration and subsidy application approval process, as these activities are being carried out at their level. Trainings sessions were also organised for the programmers deployed as PMU for smooth operation of the MIS Project.

Project management & Monitoring

The entire application runs on cooperation & collaboration of the stakeholders, i.e. the officials of DOA, allied wings of DOA like ATMA, BAMETI, farmers, and license holders. The department has engaged executive assistants from at District and block level for data collection, entry and successful implementation of the system. The partnership model used is one of "Selected Vendor on the basis of Open Tender Mode". As CSMPL is selected as the vendor for this project, it is providing the solution to the respective government client. A Project Management Unit (PMU) is established consisting of the IT professionals of Department of Agriculture, Govt. of Bihar, who ensure that the services are delivered without hindrance in collaboration with the CSM personnel.

Financial model adopted

Self-financed initiative wherein the department has planned and conceptualized the project, with the sanction of the State government. Total Cost of Ownership is INR 43.5 lac for three years.

Special efforts to ensure sustainability of the e-Governance initiative

The system hasn't undergone for any third party assessment.

Challenges faced in transition

- Frequent change request in the system due to the diverse nature of schemes being implemented and the limited sharing of information by the stakeholders during requirement gathering stage.
- Lack of IT infrastructure support and IT literacy among the stakeholders of the system

The Lessons learnt from Change Management and Capacity building

- Maximum stakeholder inclusiveness and participation needs to be ensured during the requirement gathering and development phase of the project to reduce change and repeat development work.
- Centralized IT support and helpdesk is one of the major requirement for successful implementation
- IT infrastructure and support system needs to be inbuilt at the field level to ensure proper operationalization.

Technology

The technology used for the applications are as follows:

- Platform: Windows
- Front End- ASP.NET,
- Back End/Database- SQL Server 2008 R2

Environment Hardware:	Intel Xeon CPU (4 Core), 8 GB Memory
Operating System:	Windows (Windows Server 2008)
RDBMS:	MS SQL 2008
Web Server:	IIS 7.5
Technology:	.Net 3.5

Strategy for Disaster

The system is hosted in a multi-tier data centre architecture. The entire hosting activities are outsourced to CSM Technologies. CSM Technologies is maintaining the Software, Server Hardware, Network and Security aspect of the project. A full phase infrastructure management services which includes Server, Storage, Network, Enhanced Security and 24x7x365 infrastructure support is facilitated for this project for uninterrupted accessibility. Normally the database is backed up hourly and the application is kept on daily basis. Real time backup mechanism is in place as per the Data Centre policy for application and database. As per the ISMS policy, the disaster plan and procedure are in place for this project.

Technology related challenges faced

Handling large amount of data and traffic during peak time of the system such as during launch of a particular scheme.

The Lessons learnt from Technology choices and implementation strategy

The hosting infrastructure is facilitated with High Availability and failover mode. The application and database servers are configured as active-passive environment, because of which failure of one environment is not interrupting the application accessibility. Redundant internet backbone made available in the data center, is able to handle the traffic in balancing mode.

VALUE INDICATORS

The system has been taken up with a visualization to Ensure Transparency, efficiency and effectiveness in the process of transferring benefits to the citizens in the state coming under the ambit of Agriculture Department. It is being targeted to reduce the manual intervention in the complete process so as to minimize redundancy and maximize citizen participation.

Digital Inclusion

The pages which are being accessed by the beneficiaries such as Farmer Registration, Apply Subsidy etc. have been made available in Hindi also to enable the stakeholders to interact with the system in their familiar language.

Green e-Governance

Environment friendly practices have been taken into account in the data center where the application is deployed.

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e-District Haryana

Department of Electronics and Information Technology (DE&IT), Haryana

A. Sreenivas and Ghan Syam Bansal

PROJECT OVERVIEW

"e-District is a State Mission Mode Project under the National e-Governance Plan. The project aims to target high volume services currently not covered by any MMP under NeGP and undertake backend computerization to e-enable the delivery of these services through Common Service Centers. Districts are the primary delivery channels for government administration which deliver a large number of services to the citizens; therefore e-Governance can significantly improve government service delivery." The state envisages meeting the following objectives with the implementation of e-Districts project:

- Implementation of an efficient electronic workflow system for District Administration.
- Infusion of transparency and accountability in operations
- Reduction of workload of department personnel
- Electronic security and control of confidential data
- Fast processing of services as per public requirement
- To create an cost effective and efficient delivery mechanism from the Government that brings citizens to the district administration
- Delivery of services to citizen at his doorstep using modern technologies like mobile, emails, web site etc.

e-District Haryana pilot Rohtak was launched by Hon'ble Chief Minister on 24th December 2011. After successful run of pilot, 22 services under e-District phase-I developed by NIC has been rolled out across Haryana in all remaining 20 districts in one go on 2nd May 2015 by Hon'ble Chief Minister of Haryana. Subsequently 20 more services developed by NIC under e-District Phase-II were rolled out on 27th Feb 2016 by Sh. Ravi Shankar Prasad, Minister of Telecom & IT. All these services are being delivered through 4200+ CSCs in PPP mode, government owned 126 eDisha Centers situated in all tehsils centres and 100+ department's front offices across Haryana. Around 117 G2C e-services of more than 20 departments are being offered from CSCs. out of 35 lacs+ G2C transactions from e-District Haryana, 11 lacs+ transactions has been done from CSCs since inception of the project.

RESULT INDICATORS

- The time bound service delivery has resulted in improving the efficiency in delivery of the services
- Elimination of corruption and middlemen from the process.
- By providing a wide spectrum of services at a single place in multiple locations has helped in saving citizens from the trouble of running around various departments.
- Now trips have been minimized to one.

- e-DisHa is web based application and any service can be delivered from any counter/any location, so at the peak requirements of services, counters can be extended as per the crowd.
- Due to streamlining of the service delivery, there is no hustle bustle at the counters so it creates the speedy work and more services are delivered in the same time compared to earlier system.
- Helping in integration of databases of Government departments and organizations. This integration has also forced the user departments to carry out process reengineering and standardization in delivery of services.
- Creating jobs/business in the districts for the local IT savvy youths through CSCs by making him Village Level Entrepreneur (VLE).
- Helped in improving the financial health of District IT Societies by levy of small amount of service charges.
- Status tacking of application is very easy through QR Code, SMS or web site (edisha.gov.in). It can also be known from nearby CSCs
- Verification of documents/certificates issued through e-DisHa contains QR Code, that would be used to verify the documents/certificates and it can also be verified from the web site of e-DisHa.
- Now the certificates are stored in digital repository of e-DisHa and can be downloaded anywhere-anytime.

Key Performance
117 services of 20 departments namely Revenue, Health, Urban Local Bodies, Home, Social Justice & Empowerment, Agriculture, Education, Election, Food & Supply, Transport, Sports & Youth, Forest, Fisheries, Public Health & Engineering, Industrial Training, HUDA etc. are being offered through CSCs. Services List is attached at Annexure-A.

Benefits obtained from these services
- Time bound service delivery, resulted in improving efficiency of delivery of services and elimination of corruption and middlemen from process.
- Helped in saving citizens from trouble of running around various departments.
- A wide spectrum of services at a single place through multiple channels. Speedy work and more services are delivered in the same time compared to earlier system.
- Elimination of corruption and middlemen from the process.
- By providing a wide spectrum of services at a single place in multiple locations near to his place has helped in saving citizens from the trouble of running around various departments.
- Now people gets the service in one (if supporting documents are available with him) or two (if supporting documents not available or in case of CSC) trips only.
- e-District is web based application and any service can be delivered from any counter/any location, so at the peak requirements of services, counters are extended as per the crowd.

- Due to streamlining of the service delivery, there is no hustle bustle at the counters so it creates the speedy work and more services are delivered in the same time compared to earlier system.
- Helping in integration of databases of Government departments and organizations. This integration has also forced the user departments to carry out process reengineering and standardization in delivery of services.
- Creating jobs/business in the districts for the local IT savvy youths through CSCs.
- Helped in improving the financial health of DeGS by levy of small amount of service charges.
- Status tacking of application is very easy through QR Code, SMS or web site (edisha.gov.in)
- Verification of documents/certificates issued through e-District contains QR Code, that would be used to verify the documents/certificates and it can also be verified from the web site of e-District.

Year-wise transaction volumes for various services

Certificates delivered through e-District and available for citizen to download anywhere-anytime from e-District webportal (edisha.gov.in) as well as fetch into his digital locker. List of G2C services which are being delivered through CSC.

Table: District wise Transactions through CSCs

Sl. No.	District	Tran-sacting CSCs	2015-2016	April 2016 to June 2016	01/07/16 to 15/09/16	Total (02/05/15 to 15/09/16)
1	Yamunanagar	273	44,462	34,834	39,184	1,18,480
2	Rewari	161	41,004	23,982	34,860	99,846
3	Mahendregarh	164	35,458	18,161	27,402	81,021
4	Mewat	179	38,852	17,642	19,620	76,114
5	Karnal	127	28,637	21,790	23,228	73,655
6	Faridabad	103	27,509	16,914	17,510	61,933
7	Sirsa	195	24,545	14,079	22,062	60,686
8	Ambala	159	15,196	18,551	21,450	55,197
9	Hisar	206	16,874	16,747	19,744	53,365
10	Kaithal	128	18,943	10,844	17,506	47,293
11	Jhajjar	82	22,795	12,868	10,905	46,568
12	Panipat	150	16,681	12,266	16,475	45,422
13	Palwal	133	21,810	8,024	13,196	43,030
14	Rohtak	61	21,069	10,076	9,174	40,319
15	Jind	160	12,581	10,574	15,433	38,588

Sl. No.	District	Tran-sacting CSCs	2015-2016	April 2016 to June 2016	01/07/16 to 15/09/16	Total (02/05/15 to 15/09/16)
16	Fatehabad	133	10,543	9,760	18,066	38,369
17	Sonipat	122	14,203	7,183	15,679	37,065
18	Bhiwani	203	6,429	8,886	16,568	31,883
19	Kurukshetra	113	9,468	10,284	10,909	30,661
20	Panchkula	49	10,609	5,518	5,488	21,615
21	Gurgaon	104	5,720	5,290	8,246	19,256
	Total	**3005**	**4,43,388**	**2,94,273**	**3,82,705**	**11,20,366**

Implementation coverage

Government has planned to deliver the services through CSCs , e-Disha Centres and department's front offices are being used as service delivery centres. Multiple service delivery channels are being used to provide fast track service delivery.

- *e-Disha Centres:* Government owned 125+ e-Disha centres has been set up at each tehsils managed by DeGS where services are being provided under one roof. Now citizen gets the service at single place.
- *Common Service Centres:* CSCs are being established at all 6207 gram panchayats in PPP mode. Out of which 4200+ has been established and 3000+ are functional. Now citizen can get these services at nearby CSC of his place.
- *Front Office of Line Departments:* Citizen can also avail the department specific services at their 200+ front offices like Urban Local Bodies, Agriculture, Social Justice & Empowerment, Forests, Election, Horticulture, Education, Health, Home, Sports, Food & Supply, Revenue, Public Health& Engineering etc.
- *e-District Web Portal:* The status of application and downloading of their certificates are available at e-District portal (edisha.gov.in) from anywhere-any time.
- *e-Mail:* The acknowledgement and certificates are also send through email to the citizen if he has provided his mail id.
- *SMS:* The SMS alert is also send to the citizen at the time of acknowledgement and at the time of approval of his certificate.

Description of the new services /scope

- Delivery of services through Self Service Portal.
- Integration of DigiLocker with Self Service Portal to attach documents from DigiLocker account.
- e-Signing of attached certificates by citizen
- e-Signing of deliverables certificates by concerned authority.
- e-KYC authentication from CSC

Outcomes in terms of Efficiency, Improvements and integration
Now the services are being delivered at the door step of the citizen especially in villages. The citizen is saving in terms of transportation cost, travel time, reduced number of visits to different offices for fulfillment of requirement of application process, elimination of corruption due to induced transparency in the system, tracking of application and downloading of certificates from e-district web portal at home. Nominal service charges for CSCs have been notified for each service. Every certificate issued is stored in Data Repository and is accessible on anywhere anytime basis through e-District portal.

Specific innovative ideas implemented
- To implement the e-District in integrated manner, the SReeVault concept was evolved, keeping in mind the SRDH of Aadhaar database & Smart ration card based PDS project. The data structure of SReeVault was defined in a way so that the demographic information can primarily be populated through SRDH, in absence of SRDH, citizens demographic details are registered online whenever he/she first time interacted for any e-service and thereafter at the time of final delivery of any of the e-service. The SReeVault consists of three interlinked data sets - demographic database, service data & document repository. SReeVault can become an authentic & updated database, instantly available for query / service verification of identity & service documents.
- Integration with eGras system of GoH, where ever the treasury challan are being used as payment instrument, to check amount being deposited is correct as per accounting purposes.
- Integration with CSC Wallet.

The extent of integration
Web services has been used for inter communication and data interchange;
- *UID integration through State Resident Database (SRDB):* e-District has also been integrated with SRDB which has been populated from SRDH of UIDAI. If a citizen provides his/her UID, then demographics details including photo are populated from SRDB and citizen need to provide service related details only.
- *Digital Locker Integration:* e-District Haryana has been integrated with Digital Locker, under Digital India, the Indian Government's flagship program. Push and Pull models have been integrated. In Pull model, citizen can fetch his/her certificate issued from e-District Haryana. In Push Model, all types of certificates with UID have been pushed to Digital Locker. Citizen can login to digital locker account and see his/her document parked there.
- *CSC-SPV Integration*: e-District Haryana is integrated with CSC-SPV using web services to deliver services from CSCs.
- *eTaal Integration:* Each transaction of the e-District is pulled by the eTaal portal which is Electronic Transaction Aggregation & Analysis Layer implemented by GoI.
- *CM Dashboard Integration:* Each transaction of the e-District is also pushed to CM Dashboard for real time monitoring at Chief Minister Level.

- *Integration with e-District Delhi:* web service has been provided to e-District Delhi for verification of various certificates issued from e-District Haryana.
- *Rapid Assessment System (RAS) Integration:* A POC has been done successfully for integration of RAS with e-District Haryana which is NeGD initiative for survey of satisfaction level of citizen who has availed the e-services through SMS.

ENABLER INDICATORS
Process reengineering
- Uniform process for service delivery along with timeline
- Uniform service charges across state
- Replacement of affidavit with self attestation
- Removal of Manual Certificate issuance, written by hand
- Replacement of Ink Signature by Digital Signature/facsimile signature
- Application acceptance from CSC
- Removal of physical file and acceptance of scanned supporting documents, if applied from CSC
- Multi channel Certificate delivery through internet/CSC/eDisha Centres
- Post Verification process introduced
- Citizen charter of each services defined
- Escalation Matrix for time bound work defined
- Forms have been made available on line.
- Alerts (SMS/e-mail) to user at different stages of service deliver.
- Physical visit to department eliminated

Challenges faced in implementing Process
Non-adoption and resistance of changes done through process re-engineering by the concerned officials at field level.

The Lessons learnt from the Process re-engineering
- *Resource Person:* In each district headquarter, one e-District Manager (eDM) and two District Managers (DMs) have been posted as key resource person who have been very instrumental for smooth rollout of the project. They act as bridge between field level users and service provider NIC.
- *Training of Stakeholders:* For running a project, ample training of stakeholders is very essential part. eDMs, DMs, Master Trainers & helpdesk team have been trained who provides training to field level users.
- *Helpdesk:* A three line helpdesk has been setup who caters the needs of CSCs in case of trouble shooting or usage of the software.
- *Financial:* Nominal services charges is taken from the citizen to meet the running cost of CSCs like salary of operators, stationary, maintenance, electricity, cleaning etc.
- *Integration:* Integration of two different platforms have been done using web services e.g SRDB, CSC-SPV, Digital Locker, eTaal, CM Dashboard, Other state's e-District project, Rapid Assessment System (RAS) etc have been integrated with e-District Haryana.

- *Digital Inclusion:* Local person have been selected as VLEs to run CSCs. Information & service delivery to citizen through Internet, SMS & Emails.
- *Promotion & Publicity:* It plays a major part for the success of CSCs, as initially people hesitate to trust. An awareness camp is very essential to bring people to CSCs. Mobile vans have been flagged off by Chief Minister to promote the e-District services in villages. Apart from this coverage in local media are through DeGS and fortnightly camp of DCs in villages are also being used to spread the awareness about e-services. Sufficient funds have been provided to each DeGS for this purpose.
- *Grievance Redressal:* Chief minister has taken many initiatives for redressal for citizen grievances; first is CM Window, where anyone directly go to nearest e-Disha Centres and lodge his grievance to chief minister for any problem he is facing, where a central CM grievance team at CM Office take care of each and every grievance and later takes their feedback through phone as and when the grievance is resolved, in case the resolution is not done within stipulated time, stern action is taken against erring officers. Second, all Deputy Commissioners have to camp in a village in night on each fortnight to address the grievances of local villagers. Apart from this a fortnightly division level meeting is convened at any district of that division by CM Office to review IT initiatives, its adoption and bottleneck.

Best practices adopted
- Citizen Profiling-It provides a single view of citizen information
- Self Declaration instead of Affidavit
- No need to move physical files, supporting documents are scanned & uploaded
- Implementation of RTS for time bound service delivery
- Online verification facility for institutions for verification of certificates
- Implementation of document repository
- Services extended to CSC
- Use of SMS/Email for status updates
- QR code for instant verification

Leadership, Change Management, Capacity Building during transition
- Govt. of Haryana is taking keen interest in this project. Necessary Government Orders, Notifications under Right to Service Act. are done before launch of service.
- Regular review meetings are held at level of Additional PS to Chief Minister.
- Hon'ble Chief Minister himself reviews progress at CM Dashboard.

Change management and Capacity building strategy
Change Management is done through a standard formulated process. VLEs, Departmental users may give their suggestions/feedback to eDM/DM, who in turn will discuss the same with District Informatics Officer. After initial discussion, same will be sent to NIC Haryana. The Change request will be analyzed in terms of

feasibility and after taking necessary approval from concerned authority change will be processed and intimated to users. For running a project, capacity building of stakeholders is very essential part. eDMs, Master Trainers & helpdesk team have been trained, who provides training to field level users. One e-District Manager & two district managers have been deployed at each district and their contact details are shared with VLEs for training. Masters training is provided to eDMS/DM, who in turn train departmental users and VLEs.

Project management & Monitoring

A state level apex committee has been set by the E&I.T department under the chairmanship of PS (E&IT) to regularly monitor the progress of the implementation. A district level committee under the chairmanship of Deputy Commissioner has been frame to implement and monitor progress at filed level. Apart from this, a project management unit (PMU) has been set up at National level to regularly monitor the progress of all e-District projects across the country.

Financial model adopted

Govt. of India has funded e-District pilot at Rohtak district and there after rollout across the state. CSCs are being set up on PPP mode, where 80% of service charges are being retained by VLEs and rest 20% is being shared by DeGS, CSC-SPV and SDA(State Designated Agency). Uniform service charges have been defined by the state Govt. across the state for each service being delivered through CSCs.

Special efforts to ensure sustainability of the e-Governance initiative

Software: All vulnerabilities of application software have been mitigated through third party security audit and penetration testing. All precautionary measures are adopted and standard practices are followed while coding. The in-house team of NIC-Haryana has developed the application software and maintaining on long term basis.

Infrastructure: e-District has been hosted on BSNL cloud as IaaS, which can be scaled any time without much of worries to users. All due security concerns are being handled by BSNL in a professional way. To combat natural disasters, primary DR site has been set up at NIC Haryana Data Center, Chandigarh with same infrastructure and servers keeps on synchronizing with each other at regular intervals. Another DR site of NIC is already functioning at Pune, where in back up of primary DR site is dumped every day.

Data/Information: Digitally signed documents are stored in the database in PDF format so that no one can temper the certificates and can be verified in any point of time from the database.

Financial Sustainability: For the delivery of services, nominal charges are levied on users which are notified uniformly across state. CSC-SPV wallet has been implemented and share of VLE, CSC-SPV, DeGS & SDA has been notified by the government.

Challenges faced in transition

Before establishment of e-District citizens has to run from pillar to post to get the service which largely depend upon the availability of the dealing officials. Citizen even didn't know where to go and whom to contact for those services. He has to spend a lot of time & money on transportation etc. to avail these services. There was no defined timeline by which he could be able to receive these services or response to his grievance. Hence a large number of touts used to exploit the citizens. There was no transparency in the system. Citizens were unaware of status of his application. No computerized MIS & Charts was available for decision-making. There was no interface defined for citizen to interact with government without personal appearances like SMS, email, web portal etc.

The Lessons learnt from Change Management and Capacity building

A hands on session to users is much beneficial to users rather training only.

Technology

To provide citizen 24*7 services, adequate infrastructure have been deployed at BSNL Cloud. Out of total two web servers in Network Load Balancer Mode, two database servers in Always on High Availability Mode and two reporting servers in Network Load Balancer Mode. Apart from this, regular backups are scheduled on SAN of Haryana State Data Centre. 10 MbPS MPLS link has been established between BSNL network & HSWAN. Following platform has been used;

- OS – MS Window Server 2012
- SW – Dotnet 4.5
- Webserver- IIS
- Database- MS SQL Server 2012
- Report – SSRS

Compliance of the Technology adopted

- The site has been audited by CERT IN empanelled third party with industry SSL in place.
- No details of the Credit and Debit Cards is being stored/ captured at the portal to avoid breach in financial credential of the citizens.
- The password is stored in encrypted form and OTP based changed password policy is in place. The change of password in thirty days has been made mandatory.
- Audit log is maintained as per standards.

Strategy for Disaster

To combat natural disasters, primary DR site has been set up at NIC Haryana Data Center, Chandigarh with same infrastructure and servers keeps on synchronizing with each other at regular intervals. Another DR site of NIC is already functioning at Pune, where in back up of primary DR site is dumped every day. Apart from this, regular backups are scheduled on SAN of Haryana State Data Center.

Impact and value-addition thru adaption of Social media

Primarily, e-District web portal is for back office user so social media platform is not much of use.

Technology related challenges
Immediate synchronization with DR site was the main challenge which was overcome by connecting BSNL Cloud where the e-District is hosted and Haryana SWAN through 10 MbPS MPLS link.

The Lessons learnt from Technology choices and implementation strategy
By Adopting always on High availability technology of SQL server we have been able to mitigate the challenge.

VALUE INDICATORS
Digital Inclusion
- To assist the uneducated people the services has been extended through CSCs in assisted mode.
- An awareness camp is very essential to bring people to CSCs and to counter this Mobile vans have been flagged off by Chief Minister to promote the e-District services in villages. Apart from this coverage in local media are through DeGS and fortnightly camp of DCs in villages are also being used to spread the awareness about e-services. Sufficient funds have been provided to each DeGS for this purpose.
- FAQs have been prepared in Hindi, the most commonly used language in the state.

Green e-Governance
With the incorporation of internet based payments (Debit/Credit/Internet Banking), no need to print receipt of various payments made to Govt. like Recruitment Fee, Tax Deposit etc. as same is available to concerned department, which saves printing a ton of papers.
- To Promote Green e-Governance, notices are put in Development area, to shut down computer and turn off Monitor also.
- As per GOI Disposal of ICT Gadgets policy, the vendor who supplies new infrastructure takes the obsolete hardware and disposes as per policy.

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Electronic Benefit Portal (EBT)
Finance Department, Government of Kerala

K. M. Abraham and T. Mohana Dhas

PROJECT OVERVIEW

The objective of the project is to have a generic portal for government of Kerala which can be used by any department/board for identifying the beneficiaries starting from the collection of the basics details, their verification, approval and transfer of benefits electronically to them. The system is designed in such a way that any scheme by any department/board/autonomous organisation can start using the system by configuring required scheme parameters, the hierarchies for identification of beneficiaries and disbursal, the role of each stake holder in the hierarchy, type of disbursement etc. The various types of data collection methods such as data collection from field level through CSC or through field offices with direct entry, uploading of data collected in excel sheet, various payment modes such as NEFT, AEPS, PFMS, through post office saving bank etc are available and can be configured by the scheme administrator while introducing any new scheme.

The System provides alerts and feedback to the beneficiaries and scheme mangers though SMS/e-mail as and when it happens. One of the highlight is the that the beneficiary can have account in the NEFT or Cooperative bank, including service cooperative bank, primary cooperative banks and Post office savings bank. This is beneficial to a large number of farmers who are having account only in cooperative and primary cooperative banks. Various features of the system are listed below:
- Enables electronic benefit transfer based on ADHAAR and non-ADHAAR
- Transfers through PFMS, sponsor bank, Post Office
- Any Department can be plugged in to the System and configure the schemes implemented by them
- Beneficiary can have account in nationalized bank, Post office, Cooperative bank and Primary Agriculture cooperative banks
- The beneficiary details to be captured can be configured as per the Department requirements
- The benefit disbursement can be configured so as to enable it at different user levels
- The beneficiary list processing can be managed at a single level or at multiple levels
- Various Banks and Post Office are interfaced to the system

The System is having interface for ADDHAR Enabled transfer, NEFT transfer through PFMS and through Post Office Core banking Solution. AS per the requirement of the Scheme implementing authority the same can be selected and configured.

Some of the other features of the System are
- Departments and new schemes can be plugged in easily
- New Data columns can be configured
- Work flow can be defined while configuring the scheme
- User levels can be configured
- User Roles can be configured
- Multiple Disbursement Channels available

- 11 Banks and Post Office interfaced
- Digital Signature Authentication enabled
- Transfer amount to beneficiaries' Savings account
- Beneficiary List Management possible
- Monitoring possible from any level
- Management of Data entry agencies possible
- The data entry charges to the CSC's/Data entry agencies can be calculated and transferred electronically.

Some of the major deviation from the initiative objectives is as follows

The system was initiated with the objective of making ADHAAR mandatory and makes all payments through ADHAAR only. However, this has to be changed as accept non-ADHAAR based beneficiaries and non-ADHAAR based payments also. The primary objective of the system was to transfer the benefits/incentives/etc to the farmers/citizen etc/students etc. However, due to the ease of implementation and easy adoption of the system along with the bank transfer system many departments have adopted the system for all type of regular payments like salary to executive, TA/DA to trainers. etc.

The primary objective of the system was to transfer to the bank account in NEFT enabled banks. However, due to the large number requests from the Beneficiaries the transfer to post office savings banks and Cooperative banks and agriculture cooperative banks also introduced. As per the central government requirements the facility to transfer to PFMS also introduced.
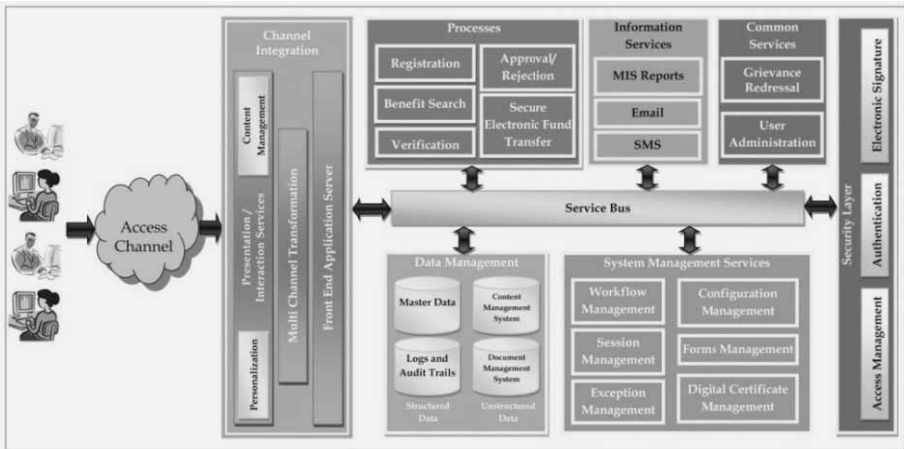
Figure: EBT Portal Architecture 1

Following are the key learning's from the system

The involvement of top management is success of adopting the scheme as a total change management sis required in the process and large number stake holders are involved.

The stake holders of the any system will not adopt a new system all the state holders including departments and beneficiaries are trying to continue with the existing systems (ICT systems/manual systems) unless otherwise there is a specific benefit from the new system (e.g. Opening of account in nationalized bank vs. account in post office or Cooperative bank/PACB, requirements of ADHAAR vs. other ID card as identity cards etc.)

RESULT INDICATORS
Key Performance

The service is provided to various types of stake holders like Citizen, farmers, students, artists, training executives, government servants etc. Various Governments to Citizen and government to government services are provided through the system. The details of various stake holders and service provided is given in the table below.

Table: Stake Holders and Services Provided

Sl. No.	Department	Service	Beneficiary	Schemes & Sub schemes	Frequency of transfer	Banks Involved
1	Agriculture	G2C/G2G	Farmers	62 /402	Monthly	10
2	Culture	G2C	Artists	1	Monthly	Post Office
3	Education (Collegiate) - ASAP	G2C/G2G	Students/ Training Executives	7	Monthly	1
4	SC Development Department	G2C	Students	3	Annual	1
6	Institute of Management in Government - IMG	G2G	Trainers/ trainees	2/6	Daily	1
5	Rubber Producers Incentive Scheme	G2C/G2G	Farmers/ Societies	1	Fortnightly	1

The benefits obtained by the stake holders in various schemes is given in the table below

Table: Benefits Obtained

Sl. No.	Department	Beneficiary Type	Total Beneficiary Count (Nos)	Transferred Amount (in Rs)
1	Agriculture	Farmers	3789027	427,97,33,242.00
2	Culture	Artists	3158	3,08,64,683.00
3	Education (Collegiate) ASAP	Students/Training Executives	124847	8,95,98,427.00

Sl. No.	Department	Beneficiary Type	Total Beneficiary Count (Nos)	Transferred Amount (in Rs)
4	Scheduled Castes Development Department	Students	388528	16,55,48,900.00
5	Institute of Management in Government - IMG	Trainers/trainees	4018	27,37,279.00
6	Rubber Production Incentive Scheme	Farmers/Societies	366604	539,55,86,765.00

The Year-wise transaction volumes for various services

Table: Transaction Volumes

Sl. No.	Board		Financial Year	Beneficiary Count	Transferred Amount
1	Agriculture	Agriculture Subsidy	2013-14	21719	4,35,34,390
			2014-15	903184	160,23,79,751
			2015-16	2005875	392,81,78,121
			2016-17	520590	115,34,96,656
2	Culture	Kalakara Pension	2014-15	2508	1,29,85,505
			2015-16	2960	2,53,74,650
			2016-17	2980	1,56,42,750
3	Education (Collegiate) ASAP	Remuneration and TA	2013-14	4176	4,86,24,999
			2014-15	9466	16,45,18,490
			2015-16	92777	30,86,07,282
			2016-17	17520	15,16,01,363
4	Scheduled Castes Development Department	Central Scholarships	2012-13	90596	19,01,61,700
			2013-14	82947	18,95,25,000
			2014-15	80697	18,34,99,200
			2015-16	79453	17,93,04,750
5	Institute of Management in Government - IMG	Remuneration and TA	2014-15	1185	8,86,967
			2015-16	1733	13,29,461
			2016-17	579	5,89,570
6	Rubber Production Incentive Scheme	Rubber Subsidy	2015-16	366604	539,55,86,765

Implementation coverage

The system is implemented for various schemes implemented by the Government of Kerala for the beneficiaries in the state of Kerala. The present stake holders are farmers, students, training executive, pensioners, citizen with specific diseases, Data collecting agencies, rubber producers societies etc.

The rubber producer's incentive scheme for rubber farmers and various other agriculture schemes are added into the system during last year. The acceptance of invoice bills for subsidy payments and various types are added. The payment though Cooperative banks including service cooperative bans and primary agriculture cooperative Banks also added from last year.

The system is updated with additional facilities like auto mailing of the summary of the scheme to the Scheme implementing authorities every day, graphical reports on progress of implementation etc. The sftp facility with SBT for the payment of rubber production incentive scheme is also introduced from the last year.

The scheme is being adopted to include payments to various other schemes like social welfare schemes, vendor payments to identified projects, creation of database of disabled persons and identification of beneficiaries and making payments to them etc.

It is also proposed to include more banks as sponsor and to make all the transactions through sftp protocol so that there is no manual intervention required at any stage.

Outcomes in terms of Efficiency, Improvements and integration

All operations in the system are done on-line and the operations for entire Kerala for any scheme could start in one go with few configurations. Even though it is an ICT enabled system the system can be configured by the Scheme administrator without the help of an ICT expert. The process work flow for approval and disbursement can be defined by the scheme administrator.

Any Department, Scheme implementing authorities and organisation who would like to transfer the benefits their stake holders could implement without developing any software and could implement the same with minimum configuration in the system.

The system of manually preparing the beneficiary list and sending the same to the state head quarters for approval and transferring the amount to the beneficiaries through Cheque, Demand Draft, Money Order etc are replaced by the Electronic benefit transfer system of Government of Kerala.

The Service delivery time has come down to around 5-6 days for the whole process of identifying the beneficiaries, giving various approvals and disbursing the same to the bank account of the beneficiary. This used to take many months and beneficiary was not having any information about the transfer of benefits.

The system generated SMS alerts at various stages and the beneficiary will be up-to-date knowledge about their system though SMS. The SMS alerts are enabled in the verification, approval stages and also on transfer of benefits to the bank account. The option to send bulk SMS to the beneficiary by the scheme Administrator whenever amount is not transferred due to any reason with reason for rejection is available. Various MIS reports generated and the graphical reports generated enabled the Scheme implementing authorities monitor the scheme at anytime from anywhere.

Around 60 and 402 Sub Schemes for the farmers are configured in the portal for the agriculture department and the subsidy amount for the farmers all over the state is being disbursed through this portal. The system is compatible with the core banking solutions of the banks, Public Finance management system, of the Government of India, NPCI , Post Office Core Banking solution, Mobile gateway of Kerala State IT mission, farmers portal of Government of Kerala and is fully integrated wherever required permissions are obtained. The system is interfaced to the SBT portal and Post office Core banking through sftp protocol.

Table: Some of the Benefits in adopting EBT Portal

Tasks without the EBT Portal	Tasks reduced while adopting EBT portal	Benefits
Identification of a agency for Software development	Not required	Quick deployment /No development cost
Complete Software Development life Cycle to be completed	Not required, Only Configuration of the Scheme in the portal is required	Quick deployment
Change management/Capacity Building etc	Required - However, the requirement is very clear	Quick deployment
Applications needs to be submitted manually to the Field offices	The beneficiary can submit the same through CSC or through authorized centers	The citizen need not visit offices
The beneficiaries are identified after manually recording the details	The beneficiary details are captured on-line	No data entry requirement
Details of identified beneficiaries are send to the higher authorities by Surface post for verfication/ approvals	The beneficiary details are verified and approved online	Faster approvals and identification of beneficiaries
Preparation of beneficiary List Calculation of amount of benefit for each beneficiary	The list of eligible beneficiaries and amount of benefit are prepared immediately	Efficiency improvement
The bill for disbursement prepared by the Disbursing officer and send to the bank	Send to the bank elelctronically	Efficiency improvement
Bank used to prepare the demand drafts / OR the field office disburses as cash	Bank is transferring to the beneficiaries bank accounts electronically	Immediate payment to the beneficiary/No handling of cash Or DD's etc
Grievances/queries send through phone and manually through Surface post	On-line Grievance redress available	Quick and transparent redressal of grievances

Tasks without the EBT Portal	Tasks reduced while adopting EBT portal	Benefits
There was no information about the status of disbursement to the beneficiaries	SMS alerts to the beneficiaries at each stage	System is transparent and details are available on-line and through SMS
Beneficiaries used to have only cash payment or DD only	Beneficiaries can get the amount to Banks, PACs/Post office etc	Flexibility to the beneficiary
Accounting and reconciliation takes years	Account Reconciliation within minutes	Accountability

ENABLER INDICATORS
Process reengineering
The major process reengineering required to adopt the system is acceptance of applications through on-line or through Common Service Centers from the traditional manual system of beneficiary visiting the office and filing the paper application. This eliminates the visit of the beneficiary to the offices. The beneficiary can visit any of the CSC which is near his/her residence.

The verification and approval of the applications and beneficiary list manual (on-paper) has been changed to electronic verification, approval. There is no movement of any paper or file and wherever manual signature is required it is replaced with digital signature. Disbursement of Cash/Demand Draft from the field offices changed to crediting to beneficiaries bank account, post office account or Cooperative bank/PAC account.

Best practices adopted
The use of common infrastructure such as state data centre for the deployment of the application and utilizing Common Service Centers as a service delivery point for any scheme, use of common mobile platform of the state for sending SMS to beneficiaries, adoption of Digital Signature wherever manual signature is required, the use of sftp protocol for the seamless integration of data flow from EBT Portal to the core banking system of banks and Post Offices etc. are some of the best practices adopted from the state government and industry.

Leadership, Change Management, Capacity Building during transition
The project was initiated after the state cabinet has taken a decision to transfer all the benefits to the citizen electronically. The support of the highest level of the government was available for the implementation of the system. All the required orders from the government and scheme implementing authorities adopting the system were issued as and when the scheme adopts the EBT System

The capacity building programmes are organized at all levels and for all stake holders including bank officials, all levels of management, field levels staff and staff of the Citizen Service Centers.

Project management & Monitoring

The project was monitored by the highest level of the administration of the state at regular intervals. The statistics of every day transactions are send through auto-generated mails to the higher authorities every day for monitoring.

The project was monitored by the respective scheme implementing authorizes whenever a new scheme adopt the system.

Financial model adopted

The Finance Department, Government of Kerala has provided the required funds for development of the core modules. The departments like Agriculture department who are implementing large number of schemes and the rubber production incentive which is having large number of beneficiaries are provided with ICT support staff for the day to day support and capacity building.

The Core ICT infrastructure of the State Government in the State Data Centre is being utilized for the hosting of the application

Major cost component is the man months required for the conception, design and development of the core systems and the integration of the same with eth ICT system of various stake holders. The manpower efforts for the development of the core system including the cost of project managers and developers work out to around 24 man months.

Challenges faced in the implementation

Some of the challenges faced in the implementation of the systems are resistance to change, requirements of training to large number of stake holders for state wide implementation of large schemes, handling of large number fo service calls in the initial days of introduction of a new scheme.

While introducing a new scheme a change management plan and capacity building exercise to be planned as part of the system. The release of Specific order/ instructions for the introduction of the scheme is not sufficient for the success of the scheme. However, the scheme implementing authorities should have a clear idea about the level at which data is captured, the data elements to be captured, the various levels of capturing the data and the authorizes verifying and approving the data.etc are to be clearly identified and the changes while adopting the system are to be communicated to the all stake holders through capacity building programmes

Many Capacity building programmes are organised for the benefit of various stake holders viz. Department officials, bank Officials and the progress was reviewed regularly. The User manuals and clear instructions to use the portal enabled the faster implementation of the portal for various schemes across the state.

Technology

The system is developed in open source platform using MySQL/PHP with Code ignator frame work and there is no cost involved for any proprietary software license or maintenance. The application software is being maintained by National Informatics Centre on man power efforts basis.

The system is designed as per the e-governance data standards and security standards of the government of India as well as government of Kerala. The system is security audited as per the Kerala State Data centre hosting policy and is hosted in the Kerala State Data centre with a Live system and fail-over system and the back-ups and Disaster recovery is done as per the policy of the State Data centre.

There were no major challenges faced in the technology fund other than the slow response of the system in the initial days of new schemes with large number of beneficiaries. This could be sorted out wt the enhancing the capacity of the servers. As cloud services are available in the state data centre, the servers could be upgraded as and when required depending on the demand. However, an initial estimate do the number beneficiaries' and number likely hits etc. needs to be taken before introducing any scheme so that the preparation are taken in advance for the likely increase of the servers an remedial actions can be planned accordingly.

The implementation of Digital Signature and their usage by the official was not encouraging due to the difficulty in getting the DSC's. compatibility with various system in the remote area's etc. This was rectified using regular update programmes on the use of DSC. This will be solved with the use of e-Sign which we are introducing in the next version of EBT.

VALUE INDICATORS
Digital Inclusion
Digital inclusion of each and every citizen is the primary objective of this system with any type of payment to any type of beneficiary can be transfer to their preferred mode electronically. Various departments/organizations are adopting different methods for preparing the beneficiary list.

The system has been developed as Unicode complaint and the data can be entered in any of the Unicode complaint languages.

Green e-Governance
The system is designed in such a way that the use of paper is minimized. The practice of printing the beneficiary list by the departments and sending the same to the bank has been totally eliminated and all the data is flowing electronically between various stake holders with digital signature wherever required.

The system is hosted in the state data centre, the common infrastructure created by the government for the e-governance projects and saves power and wastage of electronic resources. There is no need for a system in the field offices of the department as the facility to enter the data from the Common Service centers is available in the core system itself.

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Rani Laxmi Bai Mahila Samman Kosh Portal
Department of Women Welfare, Government of U.P

Renuka Kumar and Saurabh Gupta

Project Overview

Women constitute almost half of the population of the world, but in India because of social craze of getting male child has lead unfortunate human intervention in the process to obtain gender base birth control which resulted defective sex ratio and it can also be seen that female population is lower than male population significantly. Though policies at state and national level exist for the empowerment of the women in regard of health, education, political participation and gender based violence. In spite of policies which exit on every level of governance still women are not treated as equal to the men in all the segment and places of the society. Gender base discrimination and violence still exist in Indian society at a significant level. Even after continuous execution of many policies since several decades it seems difficult for the Governments to ensure equal opportunities for women in the society. As per gender biased social conventions most of gender base heinous crimes give a disgraceful life to women victim rather than to the culprit. In regard of heinous crimes against women it can be seen as a very positive vision that instead of making every day new provisions to penalize the criminals some process has to be evolved and established for rehabilitation, health, education, social participation and self esteem for the victims of such crimes. The **Government of Uttar Pradesh** has decided to launch a scheme for educationally, medically and economically empowering the victims or sufferers of dowry death, grievous hurt by acid attack, Rape resulting in death or permanent vegetative state, rape, gang rape and various Sexual Assaults which can be considered as most heinous gender based crimes.

Overview of "Rani Laxmi Bai Mahila Samman Kosh"

For empowering women against the atrocities, government of Uttar Pradesh has started an innovative scheme by integrating **Department of Health, women welfare** and Police to provide relief of the women facing atrocities. By using the proviso of Article 154 Hon'ble Governor of the State has approved and released the Rules titled as "Rani Laxmi Bai Mahila Samman Kosh Rules 2015". The purposes of rules are to ensure monitory and medical relief to the women and girls who are victims of heinous crimes, and therefore require immediate relief. State Government made a budgetary provision of 100 Crore rupees while funds from Central Government, under takings and individuals can also be included in the Kosh as donations. Funds of Kosh can be used for maintenance, education and reconstructive health of victims as well as maintenance and education of minor children of such victims. Kosh monitoring committee is chaired by Chief Secretary and a Financial Management Unit (FMU) is working at Directorate level to manage and maintain online contributions at payments. At District level a District Steering Committee under the chairmanship of District Magistrate is responsible for the certification and payment of the victim. The members of District Steering Committee are

- District Magistrate   Chairman
- Superintendent of Police   Member
- Authorized Medical Officer   Member
- DIO (NIC)(As Master trainer for technical training)   Member
- District Probation Officer (Women Welfare Department)   Secretary

Since the launch of the scheme using Rani Laxmi Bai Mahila Samman Kosh Portal rupees 19.55 Crore has been paid as financial assistance to 616 female victims or children of deceased victims.

Need of "Rani Laxmi Bai Mahila Samman Kosh"

Though some caste or other factor base schemes were exist in state for the little compensation to the victims of crimes but previously no such scheme exist in the State. This scheme started with a concept that compensation must be given to the female victims without giving any consideration to their caste, creed or economic level. Since heavy amount of compensation has to be given to the victims of heinous crimes, so Government has conceptualized this scheme not only as a budgetary scheme but doors for the donors from public, corporate, NGOs and other Governments has also been opened. Unfortunately there are several gender base heinous crimes against females in which female die which cause a huge loss to the children of deceased in regard of their future while due to some heinous crimes a lady may go to permanent vegetative state. So it is also necessary to provide assistance to the women or girl child who may not be direct victims of violence but require critical social and economic empowerment.

Rollout "Rani Laxmi Bai Mahila Samman Kosh Portal"

NIC has designed a comprehensive web based online solution (Rani Laxmi Bai Mahila Samman Kosh portal) in such a manner that if any case related with 9 defined sections of heinous crimes comes into the knowledge of police it is the responsibility of Police officer concerned to lodge the FIR and upload a copy of FIR along with filling some entries at Rani Laxmi Bai Mahila Samman Kosh portal (victim need not to apply for the benefit of Rani Laxmi Bai Mahila Samman Kosh), a designated nodal police officer of Additional Superintendent rank digitally authenticate the FIR, then record automatically becomes visible in the inbox of authorized medical officer of the district and District Steering Committee. Authorized medical officer arrange timely medical examination of the victim and feed/upload the medical report of victim authenticated by her digital signatures and forward it to District Steering Committee. Designated signatory of District Steering Committee obtain the approval of chairman in the prescribed format downloadable from portal along with signature of Police Superintendent, same would be scanned, uploaded, digitally signed and forwarded with recommendation for payment to FMU by District Probation officer using portal features. On the basis of the recommendations of District Steering Committees related with various districts State level FMU generates demand through web portal and verify the account details of the victim with PFMS response to prevent any kind of fraud. After completion of process FMU makes payment e-files of beneficiary with the help of PFMS and e-Treasury and transfer of funds is done directly into the accounts of beneficiaries. After successful transfer of fund into the accounts of victims, information is send automatically under the login of Superintendent of Police and District Steering Committee.

Key features of portal are as follows:
- Common portal for all Stakeholders with end-to-end solution.
- Application and data hosted at NIC State Data Centre of Uttar Pradesh.

- Role base responsibilities to stakeholders for timely execution and disbursement of funds.
- Electronic flow of the claim is visible for all authorized officers under their logins.
- Victim need to apply for claims, it automatically originate with FIR.
- Role base exercise for stake holders and name of victim remain concealed.
- Timely medical examination by doctors as the case is reflected under his/her login after uploading of FIR by police.
- Validation and verification of applicant's bank account is done with Public Finance Management System, PFMS.
- Establishment of Financial Management Unit at state level for monitoring & payment of compensation.
- Online contribution from the individual donors, NGOs etc. by integration with SBI.
- Processing of data at State level at FMU for demand generation.
- e-Payment directly into the account of victim or children of deceased.
- Financial and administrative management through the portal at state level.
- Relief is not effected by judicial delay or judgement of the case.
- Call Centre availability at FMU for grievance handling and technical support to stakeholders.
- As value addition integration of this portal with all social pension portals to ensure free treatment of ladies belongs to RLBMSK or any of social pension schemes.
- Stakeholders can send query to women welfare department by their logins.
- Culture of DSC authentication established in Government hospitals of U.P.
- Provided perfect end-to-end IT solution for distribution of funds.

RESULT INDICATORS

Since online Rani Laxmi Bai Mahila Samman Kosh Portal provides ease of availability with user-friendly interface, its impact on the beneficiaries as well as on the Government is tremendous. The USP of the portal is that the victims need not to apply for relief. Most of the Government office location have computer with internet facility throughout the state, so the stakeholders require lesser efforts to put or get the information on Rani Laxmi Bai Mahila Samman Kosh Portal which is universally accessible on the web. Asha Jyoti Kendras are also treated as Reporting Cahukies. For the Government there is a massive saving both in terms of finance and manpower, with less strenuous work, higher productivity, transparent process and few errors in computation. Using this on line solution for the compensation to the women victims of heinous crimes like Dowry Death, grievous hurt by Acid Attack, Rape resulting in death or permanent vegetative state, Gang Rape and Sexual Assault the State Financial Management Unit of Rani Laxmi Bai Mahila Samman Kosh has paid Rs. 19.55 Crore as financial aid to 616 female victims or children of deceased Medical treatment along with reconstructive surgeries has also been ensured for such victims in Government hospitals or referred hospitals. This medical treatment is also given to all female members out of more than 1.06 crore Social pension holders under any social pension scheme. All 616 female victims are kept away from Government office and application based procedures.

Key Performance

The main service given to citizens through the "Rani Laxmi Bai Mahila Samman Kosh Portal" is to provide financial relief to the women/girl victims of the heinous crimes under nine sections, as given below:

Table: Services under Legal Act

Sl. No.	IPC Section	Description
1	304 B	Dowry Death
2	326 A	Voluntarily causing grievous hurt by use of acid
3	376 A	Rape resulting in death or permanent vegetative state of victim
4	376 C	Sexual Intercourse by a person in authority
5	376 D	Gang Rape
6	Section 4 POCSO	Penetrative Sexual Assault
7	Section 6 POCSO	Aggravated Penetrative Sexual Assault
8	Section 4/6 of POCSO Read with Section 302 IPC	Sexual Assault with death of minor
9	Multiple Sections	More than 1 section applicable

Benefits obtained from these services

- It is not an application based scheme, which safeguards victim's self-esteem.
- It provides savings both in terms of finance, manpower with less strenuous work and lesser errors in computation or calculations
- Laxity in the process can be monitored from the highest level of Government.
- Because status of every case is visible up to highest level so morally stakeholder are bound to complete activities/formalities timely e.g. sheet, police and medico legal by doctor, recommendation by DM and payment by FMU.
- Portal base MIS for financial management and availability of budget in an up to date manner.
- Status of crimes against women in a particular district is transparently available at state level.

Year-wise wise transaction volumes for various services

Rani Laxmi Bai Mahila Samman Kosh has paid Rs. 19.55 Crore as financial aid to 616 female victims or children of deceased.

Table: Year & crime section wise compensation paid to victims against the scheme

Sl. No.	IPC section	Section Description	Year 2016		Year 2015	
			FIR	Amount Paid (in Rs.)	FIR	Amount Paid (in Rs.)
1	304 B	Dowry Death	217	65100000	45	135000000
2	326 A	Voluntarily causing grievous hurt by use of acid	17	6600000	17	6600000
3	376 A	Rape resulting in death or permanent vegetative state of victim	7	1410000	3	2100000
4	376 C	Sexual Intercourse by a person in authority			1	300000
5	376 D	Gang Rape	26	13435000	5	2300000
6	Section 4 POCSO	Penetrative Sexual Assault	177	47020000	33	9380000
7	Section 6 POCSO	Aggravated Penetrative Sexual Assault	12	3500000	4	1000000
8	Section 4/6 of POCSO Read with Section 302 IPC	Sexual Assault with death of minor	7	5318750	4	4000000
9	Multiple Sections	More than 1 section applicable	35	14010000	14	7783750
Total			**498**	**156393750**	**126**	**46963750**

Implementation coverage

- Any Thana (Police Station) of Uttar Pradesh can be considered as registration center, while District Probation Office of every district of the state in coordination with police, health and administration is responsible for establishment of eligibility for the compensation and payment.
- Portal consumes the web services to get integrated with the database of social pensioners (old age, widow and handicapped) for providing free treatment to the female beneficiaries in case of some listed diseases and surgeries, as MOU has been signed with King George Medical University & SGPGI, Lucknow. The medical university staff will use this integration module to verify the identity of the patient and to make registration of patient on RLBMSK portal for expenditure support. Government is in

process to launch this facility under Rani Laxmi Bai Mahila Samman Kosh from October 2016.

- Government is in process to ensure immunization, health and compulsory education throughout the state in Government hospitals and schools for the children of victims, beneficiaries of social pensions, residents of Mahila Sanrakshan Grah, Vradha Ashram etc.
- The spirit of scheme geographically covers following locations of the state
  - Number of State covered: 1 (Uttar Pradesh)
  - Number of District covered: 75districts
  - Number of Blocks covered: 831 all over the state
  - Number of Tehsil covered: 342
  - Number of Villages covered: more than 1,06000

Outcomes in terms of Efficiency, Improvements and integration

- It ensures that the female victim get medical facility and if required reconstructive surgery at the earliest.
- The victims are immediately get financial relief in most of the cases as first[t] installment and get final compensation after the Charge Sheet is filed. The First installment help victims in economic self-reliance.
- Complete transparency during transactions throughout the state and lesser effort is required to get the information which is universally accessible on Internet.
- Every activity related with Government Officials during execution of this scheme is monitored and responsibility can be fixed using portal in transparent way and action can be initiated for any lapse by a official. The MIS & different reports generated by the application helped the state government in regard of budget allotment and review.
- The concept of PFMS, CBS banks and DBT has provided ease and transparency which is desirable by all stakeholders, thus Rani Laxmibai Samman Kosh Portal can be viewed as an Integrated Solution of Department of Women Welfare, Department of Health, Police, Public Finance Management, Treasuries, District Steering Committees under District Magistrate and 136 Banks behind PFMS.
- The information captured through the portal is passed through various levels of authority for approval/rejection and forwarding through defined paths which eliminates chances of fraud or bogus claim. Hence, the final output is complete and credible.

Specific innovative ideas implemented

- Claim automatic originate after registration of FIR, need not to apply for claim.
- Timely medical examination and digitally authenticated medical report on portal.
- Police morally bound to file charge sheet at the earliest since pendency is visible at highest level.
- Victim need not to run office to office because of the payment directly in to her account.

- The most beautiful feature of the scheme that judicial judgment of case cannot make any impact over financial relief given.

The extent of integration
- Integration with PFMS (Public finance Management System)
- Integration with Police FIR is proposed from current year it will also integrated

Integration with Social Pension Schemes database to verify identity of a patient for free treatment.

ENABLER INDICATORS
Process reengineering
- Automatically origination of claim without applying by the victim or by her kin.
- It provides a common platform to all concerned departments and facilitates data sharing amongst the stakeholders.
- One Financial Management Unit (FMU) at State level was deployed for payment of compensation instead of separate DDOs at every District. This portal has been developed under latest centralized architecture to ensure data security, 24x7 availability of information through the portal to streamline the process of RLBMSK. The procedural delay caused by manual operations of sending FIR to Hospital then hospital sending Medical report to police station has been stopped.
- District level Steering Committees are formed to sanction the payment at the earliest.

Challenges faced in implementing Process changes
Most of the challenges were related to the web based operations and digital signatures since whole process include role based digital authentication and activities. Stakeholder consultation, enough Communication and knowledge dissemination was very necessary to build the sense of ownership among stakeholders.

The Lessons learnt from the Process re-engineering
Coordination among stakeholders was the greatest challenge as different stakeholders had varying perception about their work. Involvement of the top leadership was required to achieve synergy. The Hon'ble Governor of state approved the Rules for the scheme. The Government Orders (G.O.) are issued and updated time to time for successful implementation of project. Roles and responsibilities of each stakeholder are clearly and strictly defined in the rules and various G.O.s.

Best practices adopted
- For implementation of Real Digital India, transformation is must and for this the concept of open APIs and Web Services for integration of various sectoral databases was adopted as the best practice.

- GIGW guidelines were adopted while developing the portal.
- E-Governance Standards and Metadata Standards were followed during development of the portal.
- The "RLBMSK" web portal is made functional and hosted at NIC Data Centre after security audit.
- Secured PFMS integration was achieved using secured channel.
- The portal is developed using Component approach thus can be used by any state.

Leadership, Change Management, Capacity Building during transition

- Book of Rules with the approval of Hon'ble Governor was prepared and released to clearly define methodology, process flow and responsibilities of all stake holders. All the stakeholders are also supposed to complete their responsibilities or work well in time since laxity can be seen from highest level and defaulter can be penalized.
- Hon'ble Chief Minister of Uttar Pradesh himself took leadership role in establishing the Rani Laxmi Bai Samman Kosh.
- Continuous monitoring by Hon'ble Minister, Department of Women Welfare supported effective implementation of the project.
- An administrative committee headed by Principal Secretary, Department of Women Welfare, put day and night in implementation of the portal.
- District level Steering committee headed by District Magistrate was boon in effective implementation at district level.

Change management and Capacity building

- The Portal is very user friendly the User need not require much expertise of computer.
- Trained all the officers & concerned State Government officials of Police, Medical & Health, Women welfare and Administration regarding work flow, operating, digital signature and their responsibilities.
- State wide publicity was done to sensitize the citizens in regard of RLBMSK.
- Established a support centre at State level directorate with enough infra structure to handle the administrative or technical queries of Stakeholders.
- FMU was established for Fund management and fund transfer to victims as a central DDO for treasury functioning.

Project Management & Monitoring

State Financial Management Unit and District steering committees have been formed to constantly monitor/ review the entire process. Various committees supervising and facilitating the execution are-

- Steering committee at state level that makes strategic decisions constitutes with members like Chief Secretary, Principle Secretaries ad Directors of Women Welfare etc.
- Technical committee at state level includes State Informatics Officer, Sr. Technical Director from NIC and other technical staff.

- District Steering committee comprises of DM, SP, Medical officer, DIO and District Probation Officer.
- Dashboards for all authorities are created for effective monitoring.

Financial model adopted
- It is developed by NIC at zero cost and continual maintenance and training is provided.
- Support center at State level established with technical support man power hired for ongoing work.

Special efforts to ensure sustainability of the e-Governance initiative(s)
- Latest software and hardware have been incorporated for "RLBMSK" which makes it fairly sustainable.
- The concept of PFMS, CBS banks and DBT has provided ease and transparency which is desirable by all stakeholders.
- User privacy is maintained as each type of user has been granted role-based access through various logins on the portal. The passwords are maintained in encrypted form in the database.
- Use of DSC imposes strict checks for authenticity of department users.
- The department of women welfare in association with NIC organizes various workshops & trainings time to time for educating the concern officers of women welfare, health and police department so that everyone sustain well with the advancements in the system.

Challenges faced in transition
Changing of mindsets of the stakeholders was a difficult task, because they were well tuned with traditional manual operations.
- Master trainers should be identified from every group of stake holders, as they can better understand their own officials.
- Sufficient trainings in regard of IT are needed for medical and police officials.
- Domain expert from every department must be part of the team.

Technology
"RLBMSK" web portal has been developed by using the Microsoft technologies (SQL Server 2008 R2 & .Net 4.0, Web 2.0, JQuery)
- NET framework 4.0, IIS 7.0 at front and SQL SERVER 2008 R2 at back end for software.
- Client – Windows 8, Windows 7
- Browser - IE 8 & higher, Chrome, Mozilla Firefox

Compliance of the Technology adopted
The "RLBMSK" web portal is already functional and hosted at NIC State Data Centre after security audit. Web Application has been security audited by Third Party 'AKS Consulting Private Limited' and Cyber Security Division of NIC."RLBMSK" web portal has been developed using following proper website security mechanisms.

- The rules defined in OWASP have been taken care of-
- Proper input- output validations have been adopted.
- Error handling mechanism has been used.
- Prevented SQL injection attack
- Proper session management and prevention from XSS
- Server side validation/form validation
- Salted MD5 technique used for password protection. The passwords are stored in encrypted form.
- Role based authentication has been implied, digital signature authentication foronline verification.

VALUE INDICATORS
Digital Inclusion
No issue since all the work has to be done by Government setup and content is bilingual.

Green e-Governance
Since this scheme ensures electronic flow of the documents during whole process, it saves paper and improves Carbon Credit Rating of the state.

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RTI Online Portal
Department of Personnel and Training, Government of India

Devesh Chaturvedi, Gayatri Mishra, Piyush Kanal and S. N. Sowpari

PROJECT OVERVIEW

The Department of Personnel and Training took an initiative to facilitate Indian citizens in filing the RTI applications and to facilitate public authorities in managing and monitoring RTI applications, by applying the tools of Information and Communications Technology (ICT). RTI Online is a Government to Citizen (G2C) as well as Government to Government (G2G) service based web portal. This ICT tool is a web based centralized system to manage and monitor the RTI requests and first appeals received by Public Authorities (Public Authorities) of Central Government Ministries/Departments. This ICT tool intends to benefit the citizens to a larger extent to avail online facility of filing RTI requests and first appeals to any Public Authorities of Central Govt. Ministries/Departments and tracking easily the status of these request and first appeals at any point of time and at any stage.

The portal has two interfaces viz. Citizen Interface and Public Authority (PA) Interface. The Citizen interface is integrated with payment gateway for online payment of RTI fee and additional fee, if any, by the citizen. On the hand all the enlisted public authorities can process the RTI application through public authority interface of the RTI online web portal hence an end to end ICT service delivery and data management mechanism is put in place to brought greater convenience and higher transparency in dealing with RTI application across central government agencies

As on date (writing of this document) 690 central government public authorities are linked with this RTI online web portal and applicant can now file RTI application to any of these public authorities using our service. This service is not only limited to filing of applications directly to concerned organisation but also hassle free payment model is integrated to help applicants pay RTI fees or additional charges if any towards his RTI application. Also applicants receive the reply for their RTI application through this portal only thereby making this initiative as one of the paperless and eco-friendly approach in government infrastructure, This portal has been developed keeping in mind that it should be user friendly with high level of automation where required,

This initiative is still in the evolution phase where by more & more public authorities are added in due course of time after enough sensitization and training of stakeholders, our AIM is to build a common platform of all the central government public authorities across India so that a one stop solution can be provided to all Indian citizens to file an RTI application from any part of the country to any organization, at any time as per his/her convenience.

RESULT INDICATORS
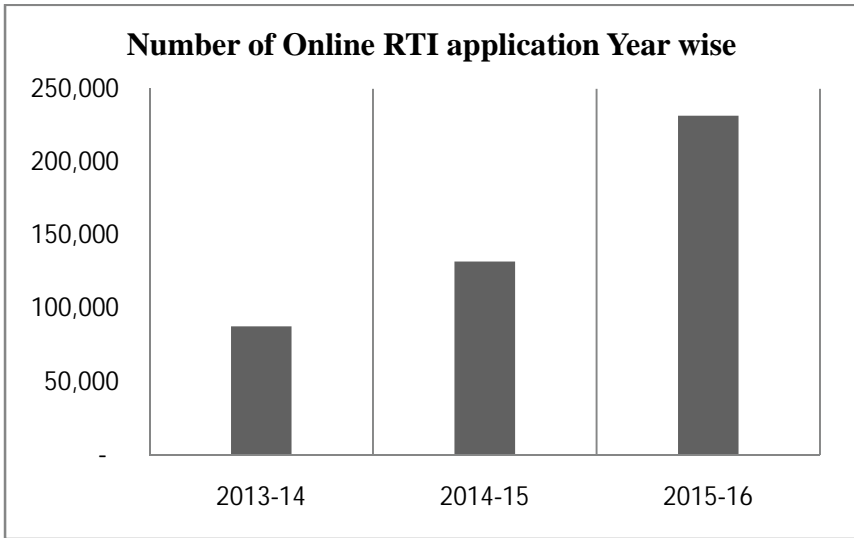
Figure: Number of online RTI Applications

Key Performance

This is a Government to Citizen and Government to Government integrated ICT Services where intended applicant can file RTI application to any central government organisation associated with this web portal and the recipient public authority at their end will process this application and provide reply to applicant directly without any delays. In addition to this primary function, this system allows all the associated public authority to exchange RTI application among themselves as per the provision of the RTI act

RTI applicant perspective
- Can file RTI application to any of the listed public authorities in the portal,
- Freedom of choosing his convenient time for filing of RTI application as the system is available 24x7x365 days,
- Bilingual support of English and Hindi
- Savings on overhead costs in terms of time and money
- Facility of creating user account on the portal for managing RTI applications and their reply in digital format.
- Facility of paying RTI fee and any other additional fee if applicable
- Automated alerts for any development for his/her RTI application

Public authority perspective
- ICT platform to deal with RTI application
- Promotion of digital environment and change management
- Storage and digitization of RTI records
- Intra & Inter Organisational exchange of RTI applications

- Online reply to applicant via this system
- Automated reduction of transition delays in flow of information
- Maintenance of all action histories for future references
- Paperless work and file management
- Publication of records on the website under Suo-motu disclosure
- Availability of organized data for analysis and representation for any future reference
- Automatic generation of Quarterly returns meant for CIC

Year-wise wise transaction volumes
- Apr – Mar 2015-16 – RTI application filed using this system **231688**
- Apr – Mar 2014-15 – RTI application filed using this system **132062**
- Apr – Mar 2013-14– RTI application filed using this system **87878**

Implementation coverage
This system is applicable and functional for all Indian citizens who are empowered by the enactment of RTI act 2005 hence geographically it has global reach, so anybody eligible for seeking information under RTI act 2005 from any Indian central government agency can use this system. However, from the supply side point of view this system covers over 33% of central government bodies integrated with this system and the numbers are increasing. Since inception many improvements have been made in this system based on the feedback from various stake holders some of the major one are listed below: -
- Increase of upload limit to 2 MB
- Providing FAQs and user manual for guidance
- Dedicated helpdesk for query resolution
- Adding more public authorities as requested by the applicants
- Providing automated alerts to stakeholders at public-authorities

Outcomes in terms of Efficiency, Improvements and integration
Efficiency: RTI online system is very efficient in terms of
- Financial costs – lack of postage stamps, stationary, travel expenditures
- Opportunity cost – Convenience of filing RTI application any time, any day round the year
- Reduction of transition delay/Lost in transition – Elimination of the possibility of transitional delays as every transaction is electronic and instantaneous
- Turnaround Time – Owing to former efficiency measures T.O.T for online RTI application is greatly reduced

Improvements
RTI Online is the only online alternative that provides end to end support to applicant to file and receive the reply of an RTI application. A unique system created by DOP&T and allowing all the other central government agencies to become a part of this system without any financial implication, An ICT tool in the

line of sight of digital India dream that empowers common man and simultaneously creating digital environment in government infrastructure

After coming into existence responsibility of ensuring the smooth implementation and improvements regarding this portal lies with the dedicated professional team (RTI PMU) established by DOP&T in 2013, since then this unit is working in tandem with all the stake holders to keep this portal functioning. RTI-PMU coordinates with stakeholders for the feedback and desired features in the system which is conveyed to back end team for feasibility study and implementation

Integration
RTI online database can be integrated to Organisational display of information into public domain hence all the RTI application and their reply can be published on the departmental website, apart from this Inter Organisational. Sharing and integration of linked databases is planned for next phase to help competent authorities to make informed decisions (i.e. Integration of RTI ONLINE with CIC online)

ENABLER INDICATORS
Process reengineering
RTI online administration is governed by annual action plan prepared by IR Division DOP&T and executed by RTI Project Monitoring Unit DOP&T and as per the action plan 2016 our target is to align all the central government public authorities with this portal however as of now 33% of the total public authorities are aligned with this system, RTI PMU is front end support for this system & is responsible for

- Troubleshooting & support for resolving queries of citizens and government officials
- Feedback and continuous improvement
- Pre alignment training of Nodal officers, FAAs and CPIOs

National Informatics Centre provides backend support for this portal & they are responsible for hosting this system in secure environment of National Data Centre of NIC. Also the data is using SSL encryption. NIC work in coordination with RTI PMU to carry out tasks related to RTI online portal as & when required

Challenges faced in implementing Process changes
- *Resonance among government organisation to adopt this system*: Foremost challenge faced while implementation of this system is to bring all the stakeholders on a common agreement to adopt this system as it would be an added responsibility however the same was conquered by the argument that in all the organisations similar ICT approaches in the form of E-Office, intranet, Grievance redressal system is already functional which actually had made life easy of government officials
- *Replication of an ACT by LAW into an E-Governance practice*: Second challenge was to implement the provisions of the RTI act 2005 into a

working online system which efficiently and economically help the stakeholders to carry out their duties and responsibilities.

- *Sensitization and training of stakeholders*: Another challenge in the implementation of this system was to train the stakeholders on how to use this system. RTI PMU is responsible for providing all necessary training regarding this system

- *Too many Public information officer*: As per the RTI act there are numerous Public information officers and to cater all of them within a system and ease of functionality we introduced a single collection point of RTI application at organisation level called as nodal point and from nodal point application are then forwarded to respective public information officers.

- *Financial implication*: One of the major challenges was collection of RTI fee and additional payments if applicable, for this a centralized bank account was opened whereby all RTI fee and additional payment are received directly by Government of India. Also through this system we have eliminated the concerns that whether the applicant has paid the requisite RTI fee or not as without mandatory payment of RTI fee, above poverty line applicant will not be allowed to file the application

Leadership, Change Management, Capacity Building

Leadership Department of personnel & Training being the nodal agency for implementation of RTI act across nation took the liberty to empower the citizens of India in an additional way by providing them an ICT tool to exercise the Right of information as per the RTI act 2005 also adding to E-governance practices regime

Capacity Building Strategy, Project Management & Monitoring

To ensure smooth implementation, capacity building and monitoring a dedicated Project Monitoring Unit (PMU) comprising of management professionals headed by a Senior Management Associate and comprising 3 Management Associate has been set up to facilitate in successful liaisoning, roll out and implementation of this project in all Central Ministries/Departments. The PMU also cater to the training needs and resolve the technical issues of the said public authorities. The same team is handling the front end aspect of the portal i.e. the citizen side of it in terms for having an efficient query resolution system through mail and over the phone helpline and also institutionalizing the feedback mechanism of the portal.

Special efforts to ensure sustainability of the e-Governance initiative

A dedicated Project Monitoring Unit comprising of management professionals headed by a Senior Management Associate and 3 Management Associate directly hired by the DoP & T has been set up to facilitate in successful liaising, roll out and implementation of this project in all Central Ministries/departments. The PMU also cater to the training needs and resolve the technical issues of the said public authorities. RTI Online helpline and email suggestions/feedback are also managed by the PMU.

Technology
RTI Online Portal is a web based application and can be accessed on an electronic device (Computer, Mobile, Tablet etc) having internet connectivity and has been developed using Open Source Technology (viz. PHP and Postgresql platform).

RTI Online has been integrated with Payment Gateway of SBI. It also provides the web services for transfer of data related to Requests and First Appeal for its consumption by various Public Authorities so that the same may be published in their respective websites under proactive disclosures (RTI Act).RTI Online has been hosted in secure environment of National Data Centre of NIC behind fire wall. The application has been deployed using SSL encryption.

The portal facilitating the citizens to file their RTI applications (Requests/ First appeals) online with various Central Govt. Public Authorities across the country as well as provides transparency in the processing cycle of the RTI applications. The portal facilitates senior officers/nodal officers to monitor the various aspects relating to RTI Requests and First Appeals. As per the cyber security standards, audit trails for the following are maintained in the application

- All transactions done for payment of RTI fee and additional fee.
- Logins of various users of RTI Online
- SMS and Email alerts to Citizens
- Viewing of web pages by various users of RTI Online
- Various actions taken by Nodal Officers, CPIOs, FAAs, DPIOs in the processing cycle of RTI Request and First Appeal.

VALUE INDICATORS
The basic object of the Right to Information Act is to empower the citizens, promote transparency and accountability in the working of the Government, contain corruption, and make our democracy work for the people in real sense. It goes without saying that an informed citizen is better equipped to keep necessary vigil on the instruments of governance and make the government more accountable to the governed. The Act is a big step towards making the citizens informed about the activities of the Government.

Digital Inclusion
RTI online portal support Hindi and English for facilitation of RTI application and receiving reply. Also attachment feature is available wherever necessary so that the intended individual is not restricted on account of lingual inputs.

Green e-Governance
*Paperless transaction***:** RTI online system strictly advocate paperless work across system in fact training manual is in the form of soft copy and accessible to all stake holders apart from that RTI online is not just information disposal system but in fact a management information system that is capable of storing, digitizing, distributing and cataloguing of RTI information.

Hardware requirements: Stakeholders for RTI online system does not require independent hardware for this system all they require is a client machine connected to internet thereby reducing electronic waste.

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Systematic Administrative Reforms for Achieving Learning by Students (SARAL) Application

School Education and Sports Department, Government of Maharashtra

Sunil Magar

PROJECT OVERVIEW

School Education & Sports Department, Government of Maharashtra has been leveraging e-Governance to improve the quality of teaching and delivery of services to target beneficiaries and citizens. Various portals have been developed to improve the productivity and efficiency of the Government. To achieve this endeavour, a number of projects such as School, Staff (teaching and non-teaching) & Student database, SanchManyata (Staff Approval), Samayojana (Staff Transfers) , Common Admissions Portal, Online School Admissions (as per RTE's 25% reservation), Mid-day Meal, Staff training and Digitization of academic records have been undertaken and successfully accomplished.The department is one of the largest in terms of the number of stakeholders as it has more than 20.20 million students, 7.5 lakh teachers and 1.07 lakh schools being a part of school education ecosystem in Maharashtra. SARAL targets to create a conducive environment for learning. The target beneficiaries of SARAL are as follow:

- School Education Department, Government of Maharashtra
- Commissioner, Education
- Various Directorates of School Education Department
- School, Staff & students
- Parents and NGO
- MHRD-UDISE
- Other Government Departments (Social Welfare, Tribal Welfare)
- Project specific Directorates

RESULT INDICATORS

Key Performance

Service rendered using SARAL application is mainly Government to Government type of service

- Student Registration
- Staff Registration
- School/Sanstha Registration
- RTE admission application
- SanchManyata
- MDM tracking

Portals like Online Student transfer, Online Sanchmanyata, RTE admission application, Mid-day meal monitoring are using SARAL as a master database.

Transaction volumes

Table: Number of Transactions of Different services in Last one year

Name of Service	Transactions during last one year
Student Registration	22,047,105
Staff Registration	633,320
School/Sanstha Registration	122,292

Name of Service	Transactions during last one year
RTE admission application	104,378
SanchManyata	99,627
MDM tracking	80,000 (daily approx.)

Implementation coverage

Application is being used by 1.7 Lakh Schools in the entire State of Maharashtra

Outcomes in terms of Efficiency, Improvements and integration

SARAL application has helped department in following aspects:
- Digitization of records of student, teachers and schools
- Creation of dashboards for swift action
- Increase in transparency at lower level of hierarchy
- Integration with legacy applications

ENABLER INDICATORS

Process reengineering

Availability of information at a centralized database by collating data gathered from schools across Maharashtra. The major challenge is the Incumbent's non-exposure to technology. The best practices of Maharashtra State is pioneer in implementing Centralized database i.e. SARAL for all its stakeholders

Leadership, Change Management,Capacity Buildingduring transition
- *Leadership:*Department created master trainers which in-turn trained teachers at every school.
- *Change Management:*Extensive training sessions were conducted to demonstrate the features and usability of SARAL application
- *Project Monitoring:* The project was monitored by the e-Governance Cell Chairman by conducting regularly VC meetings with different stakeholders
- *Financial model adopted***:** Department has funded the entire project

Technology

Technological solution adopted:
- Operating Environment – Cake PHP
- Operating System – Linux 6.5 (Santiago)
- Database – Postgres 9.3
- Web Server – Apache 2.0
- Front End – Cake PHP 2.5

Security and confidentiality compliance:
- Use of secure socket layer (https) connections
- Maintenance of workflow logs
- Data tracking
- Security audit by third party agency
- Role based access to stakeholders
- Planned implementation of biometric security measures and digital signatures in upcoming 2nd phase

***Strategy for disaster recovery and service continuity*:** Data backups maintained at State Data Centres (SDC) and SDC's disaster policy to be followed in case of any force majeure

Social Media adaptation: Creation of cluster-wise WhatsApp groups, administered by trainers, for swift resolution of queries and to support initiatives proposed by incumbents or stakeholders

Technological challenges

High amount of inflow of data traffic on servers was encountered in the beginning. The same was counteracted by using load balancers on different servers.

VALUE INDICATORS

- Aadhar card integration with students' data
- SMS based communication to and from the user for services like MDM data, reminder messages, intimation messages and OTPs
- Dedicated mobile app to capture mid-day meal (MDM) data regarding consumption and inventory
- Dedicated mobile app to check Samayojana (staff transfers) status
- Google maps used for locating nearby schools for students to fulfil 25% quota admission under RTE
- Integration of school, student and staff databases for creating a centralized data repository for efficient administration by state and central governments
- Use of Borderline technique to determine actual number of students in a school, and thus teacher approvals, so as to eliminate excess staff approval
- Statistical reports are now available in graphical view for easier interpretation thereby helping in making quick administrative decisions at higher levels
- Generic websites for all schools
- Alerts have been provided to ensure correctness and completeness of data

Digital Inclusion

All stakeholders have been covered under this project.

Green e-Governance

A different type of statistical information is required for different types of educational and administrative work. Such information is often demanded at various levels, from schools. This information is available at different levels in the form of hard copy instead of maintaining a soft copy. Thus, teachers and headmasters have to spend time and effort for compiling such information. Also, there is a huge amount of paper wastage in the process. Hence, one of the important reasons behind introducing SARAL was to eliminate this wastage and introduce the concept of "paperless office" or "eOffice".

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"Saksham" The e-Scholarship
Department of Information Technology and Communications, Uttar Pradesh

Rajendera Kumar Tiwari and Saurabh Gupta

PROJECT OVERVIEW

Uttar Pradesh is most populous Indian state, with home to more than 20 million people or one-sixth of the country's population. The Government has taken number of steps to uplift the economically weaker sections of society and to reduce inequalities in income, status and opportunities for such disadvantageous sections of society. The scholarship and Fee reimbursement scheme is one of the most prestigious scheme for the educational upliftment of the poor students. The Distribution of scholarship and fee reimbursement is also a major step which improve quality of education, increase literacy rate and motivate the under privileged students for higher studies. The Scholarship and fee reimbursement scheme is run by Social welfare department for the SC, ST and general categories while backward welfare department and minority welfare department are responsible to execute this scheme for the backward class and minority categories respectively. The scheme is to provide financial support to the students having family income up to two Lakh rupees, along with a cap of fifty thousand rupees against fee reimbursement to OBC, General and minority students while in case of SC or ST fee can be reimbursed up to any amount. The distribution and management of scholarship & fee reimbursement to more than 25 Lakh students is in fact herculean task for the concern departments since scheme covers students studying in 30,403 High Schools, 16,510 Intermediate colleges and 11,254 post matric institutions for graduation and above levels.

The IT solution "SAKSHAM" implemented from academic session 2014-15 by the Government of Uttar Pradesh for the management and distribution of the scholarship and fee reimbursement among eligible downtrodden students. It is the first of its kind project in the country having IT based initiative for electronic transfer of scholarships & fee reimbursement to the right and deserving candidates within time frame and without leakages. "SAKSHAM" comprises integration of various departments of social sector, education, finance, administration, banks etc which electronically ensures authenticity and validity of a beneficiary. Because of rigorous scrutiny achieved through several integrations it has stopped misappropriation of funds, bogus claims and frauds which resulted saving of huge financial exchequer of government. Besides simplification and improvement in working, the approach has brought about a fine balance between facilitation and compliance as a blend of well-defined goals and performance metrics, benefits were directly transferred in to the accounts of 32.79 Lakh and 25.5Lakh students for academic session 2014-15 & 2015-16 respectively reducing drastically transaction failure from 10% to .36% stopping a loss of more than 520 crore in a single year.

Before implementation of "SAKSHAM" all three departments namely Department of social welfare, Department of Minorities and Department of OBC were responsible to run the scheme separately for categories related to them at district level and the State Directorates were responsible for the allotment of budget to their district level offices as per their demands. District level offices in coordination with all the heads of educational institutions of district used to calculate the requirement

manually for sending the demand to concerned state directorates. Students used to submit their ink signed forms in the institution concerned along with all necessary documents related with caste, income, domicile, marks sheet and bank account detail. The head of the institution was responsible for certification, verification and category wise submission of forms in concerned district level welfare office. Social welfare, backward welfare and minority welfare departments used to provide consolidated amount of money to the institute against the scholarship claim of all the students of related category by an account payee cheque in favour of institution. It was responsibility of the institution to pay the scholarship to the every individual from the consolidated amount received.

Later this system was shifted over district level stand alone client server based approach, during those days head of institutions were provide applications physically and electronically to the concerned welfare department and concerned welfare department used to generate demand after merging all the data electronically received from various institutions of the district. An off line software was used at district level for the generation of budget demand and allotment of scholarship and fee reimbursement to the students in order to their ranks fixed according to some criteria (depend upon type of institution, family income, group etc) against availability of budget in a particular category. Printed bank advices against student's account were generated and used for money transfer instead of distribution by institutions. Critical drawbacks of the old systems were

- Delay in distribution, sometime more than a complete session.
- Fraudulent claims because there was no mechanism for verification of student at state level.
- It was not possible to check Income, caste domicile certificates of students.
- Verification of bank account details was also not possible.
- No procedure of reduplication over state which leads fraudulent claim.
- Non tracking of the course for which the student availed the scholarship and fee for last year, can't be traced.
- No procedure to check the uniqueness, if a student is claiming scholarship for multiple courses.
- Little monitoring & control due to the involvement of thousands of institutions and various departments.
- Huge undistributed amount lying in sundry accounts of bank due to wrong accounts.
- None availability of the data regarding recognized institutions of the state along with their courses and fee structure which cause misappropriation of funds and frauds.
- No procedure to fix the responsibility of institutions regarding their parts in the scheme.

Rollout "SAKSHAM"

A task force of administrative and technical people was deployed for planning, monitoring and evaluating result based development and management of the online system for tracking the overall performance of the scheme. Virtual comparison of new process with existing system was done, performed observation and monitoring of factors that may influence the proposed process. Critical drawbacks, bottle necks,

deficiencies and catches were clearly traced with a decision that rule book of scholarship 2013 will be amended accordingly so that new proposed system must not face any hurdle. Since a common portal base solution was proposed for social welfare, backward class welfare and minority welfare departments, workshops and brain storming sessions with all stakeholders were organized to eliminate or minimize the diversities of the process among these departments. During academic session 2014-15 the "Book of Rules" (Niyamawali) for the scheme was revised as per the need of new portal based integrated online solution "SAKSHAM". It was projected that approximately 20 to 50Lakh students studying in 25000 institutions would use the proposed solution for the benefit of the scheme. First of all it was the prime necessity of the scheme that an authenticated master data for all the recognized institutions must be prepared along with courses, number of approved seats and fee structure.

The database should be verified and validated by the competent authorities and heads of the institutions so that any student of unrecognized or fake institution would not be able to participate in the scheme. Social welfare, backward welfare and minority welfare departments were expected to restructure their financial administration and management in such a manner that for district level distribution of money, whole financial process and events must be modified to be executed from a single point at state level for each of three concerned departments, so that drawing, disbursing, financial management and accounting can be done at state level in a transparent manner. It was also conceived that the system should enforce role base functionality and provide a common platform to students, all stakeholders and concerned departments (Social Welfare, Backward class Welfare, Minority Welfare, Educations department, Treasuries & Institutions etc). It was decided that online applications for scholarship and fee reimbursement would be received through portal only so that scrutiny can be performed over the database of electronically received applications at state level through various integrations and authentications techniques. Authentication of the Identity and validity of the institutions and students will be done by the digital signatures of the concerned authorities. In case of mismatch between availability of budget and demand generated for a category, the selection of students for the benefit should be done in order of uniform state level criteria and benefit must be transferred directly into the accounts of beneficiary. Model of "SAKSHAM" can easily be under stood because conceptually it includes only seven steps for completion of the process

Step 1- Master Database Preparation
Step 2- Inviting Online Applications from Students
Step 3- Verification of Student's ID & Documents by the Institution
Step 4- Automated Scrutiny of Applications received
Step 5- Verification of suspect data, Approval & Digital Locking
Step 6- Data Processing & Demand Generation
Step 7- Fund Transfer through treasuries (PFMS, e-Payment)

RESULT INDICATORS

The impact on the beneficiaries as well as on the Government has been tremendous. Since "SAKSHAM" is an online portal which provides ease of availability with user-friendly interface, students are able to apply from any geographical location

having computer with internet facility along with a complete transparency in scholarship transaction throughout the state. For citizens lesser effort is required to get the information which is universally accessible on the web- portal (http://scholarship.up.nic.in). For the Government there has been savings both in terms of finance and manpower with less strenuous work, higher productivity, transparent process and few errors in computation.

Key Performance
Services
Mainly "SAKSHAM" provides "Government to Citizen/Students" service. The portal based on line solution receives application for the scholarship and fee reimbursement from the students belongs to any category. After processing at state level it simply electronically transfers the scholarship and fee reimbursement amount directly into the accounts of valid applicants. "SAKSHAM" uses the concept of direct benefit transfer (DBT) using PFMS and works as a comprehensive online end to end service delivery oriented solution.

Benefits obtained from these services by each category of stakeholders.
"Benefits obtained by organizations"

- The "SAKSHAM" provided a common platform to all stake holders (Social Welfare, Minority Welfare, Backward class Welfare, Institutions, Treasury, Banks& Planning departments) involved in the scholarship management process.
- The provision of Digital Signature DSC at various stages has enabled the organizations/institutions to be more authentic and responsible in view of IT Act.
- State Level single Drawing and Disbursing officer for every department in spite of many officers at every district provided smooth and transparent financial management and control.
- The centralized database and online availability of information helped in monitoring of enrolment and drop-out rates. MIS made it easy to analyze the overall impact and outcomes of scholarships being provided to the students.
- There are no cases of funds lying unutilized and the system has provided savings both in terms of finance and manpower with higher productivity.
- Enabled State Government to save huge amount of funds by preventing frauds and bogus scholarship claims achieved by the scrutiny by "SAKSHAM".

Table: Removal of fraudulent cases (Figures in Lakh)

Physical summary after stepwise scrutiny & verification		Academic session	
Sl. No	Action Points	2014-15	2015-16
1	Online Registration	81.36	73.91
2	Applications forwarded by educational institutions	55.33	39.73
3	Applications verified by DIOS / Regional Higher Edu. Officer	54.72	39.66

Physical summary after stepwise scrutiny & verification		Academic session	
4	No. of suspect applications in State level scrutiny (on 23 parameters)	23.84	13.04
5	Verified by Dist. Level officers	28.20	30.41
6	Total No. of students covered under scheme	26.83	23.55

Benefits obtained by Students/Citizens
- As inherent strength of internet "SAKSHAM" Portal ensures 24x7 availability. So the students can register, apply and track application status from any internet enabled location.
- They need not approach various offices involved in the scholarship approval/ disbursement process.
- Rigorous scrutiny filter out fraudulent and bogus claims at state level, so deserving and righteous students got the scholarship instead of crooks.
- If sufficient budget is not available against demand genuine applicants get the benefit as per the priority established in order to their educational merit in a transparent manner.
- Timely payment of scholarship and fee reimbursement directly into the account of beneficiary.
- Need not to submit documents and necessary certificates physically again and again.

Table: Transaction volumes for various services

Session 2015-16 (all figures in Lakh)					
	Application Submitted	Application Forwarded by Institutions	Found correct after scrutiny	Students got the benefit through e-Payment	Number of Financial Transactions done by PFMS to transfer the benefit
Post-Matric	50.25	39.72	26.87	23.55	36.08
Pre-Matric	6.81	4.63	3.52	1.96	1.96
Total	57.07	44.37	30.38	25.52	38.04

Implementation coverage

"SAKSHAM" covers all the students studying in any of the Government recognized institution, spread over the geographical area of the U.P state. Following table shows the educational setup of the state for post-matric education, head of institution is a stakeholder of the project and work as per assigned responsibility by using digital signature authentication.

Table: Educational Scenario of the State UP

Universities Involved	67
Intermediate Colleges: Rural	10444
Intermediate Colleges: Urban	4468
Institutes & Colleges	8812

The district level departments of social welfare, backward class welfare, minority welfare and Government treasury are the main stakeholders which exist at each district. Aadhaar number has been made mandatory for applying the scholarship from academic year 2016-17, it will add another mile stone in the way of SAKSHAM. Aadhaar authenticated data will further minimize fraudulent claims of scholarship and fee reimbursement. Students applied for new course without completing previous course will be made ineligible for scholarship by matching the data of previous years with current applications.

Outcomes in terms of Efficiency, Improvements and integration
"SAKSHAM" use various integrations for scrutiny which has been proved as a land mark achievement in the way of preventing the spirit of scheme from the frauds, because of the integration and scrutiny more than 1 Million erroneous/suspected records were eliminated, as a result more than 500 Crore Rupees of Government funds were saved during academic session 2014-15.

Time and cost efficiency improvements
- Amended Book of Rules with the approval of Hon'ble Chief Minister was prepared & released to clearly define methodology, process flow and responsibilities of all stake holders.
- Single portal based management and disbursement of scholarship & fee reimbursement for Social welfare, backward welfare and minority welfare departments.
- Use of digital signatures on each pivotal stage of application for e.g. Application verification by stakeholders.
- One DDO at State level was designated for each department (Social Welfare, Backward Welfare & Minority Welfare) for disbursement of scholarship & fee reimbursement instead of multiple DDOs at district level.
- Certified Master data of all institutions of State was prepared with courses & fee structure.
- Provided smooth and transparent support to financial management.
- Displaying status of application at every stage of process.

Specific innovative ideas implemented
- Uniqueness ensured by reduplication with help of high school roll number and passing year.
- Results of universities included so that marks can be verified & student's priority for the benefit can be fixed in a transparent manner.
- Removal of failed students.
- Removal of student applied in different courses while renewal is pending for previous one.
- Provided comprehensive monitoring tool in form of a Dashboard with MIS.

The extent of integration
- Integration with e-district data for verification of Caste, Income & Domicile Certificates.

- Integration with Board of Secondary Education results to authenticate identity of candidate.
- Integrated with Public Finance Management System (PFMS) to verify Bank account & payment.
- Integration with counseling data of APJ Kalam Technical University, Lucknow
- Integration with Aadhaar has to be done from current session 2015-16.
- Integration with annual results of all state universities and central universities in the state.

Table: Major Performance indicators of "SAKSHAM"

Performance Indicators	Before "SAKSHAM"	After "SAKSHAM"
Online application form for students	Not Available	Available
Authenticated & verified Master data of all institutions of state	District level master data available.	Digitally authenticated Master data for the State is available.
Minimize drawing & disbursing officers to ensure smooth financial management for state	One Drawing & disbursing officer for each of three departments at district level. (Total 225 DDOs)	One Drawing & disbursing officer at State level was designated against each department (Only 3 DDOs)
Reduce use of paper	Attach multiple certificates with the scholarship application form every year	Required only once at the time of commencement of the course.
Keep applicant away from Government Offices	Stroll around different offices for scholarship disbursement	Details of scholarship is available online with SMS facility
Reduce unutilized money.	Huge undistributed amount in sundry accounts of bank due to wrong/malicious Bank accounts.	Direct e-payment in to the account of beneficiary after authentication of bank account using integration with PFMS.
Tracking mechanism for a particular student	No tracking mechanism of students and their academic progress	Proper tracking is done till higher education.
Find out and filter out Fraudulent, bogus and duplicate claims	Fraudulent, bogus claims and Institutions can not be identified.	Checks imposed for frauds and crooks, over 1 million such claims were filtered out.

ENABLER INDICATORS

Process reengineering

SAKSHAM has shifted the scholarship process from offline district base system to completely online process from scholarship claim application to sanction and disbursement level. One DDO at State level was designated against each department for disbursement of scholarship and fee reimbursement instead of multiple DDOs at each of 75 District. Duly verified and digitally authenticated common database of all Institutions for the State prepared with courses, Fee Structure, number of seats etc. Most of the verifications are done through integration; digital signatures were used for the authentication of data.

Challenges faced in implementing Process changes

Any new initiative of "SAKSHAM" kind, involving three major wings of the social welfare, faces a number of technical and Administrative challenges arising out the different objectives being pursued by every wing. Some of the challenges, faced and addressed in the implementation of "SAKSHAM" are as following:

- Departmental officials were afraid because of common portal and shared data.
- The number of employees to be trained on the SW was large, which were achieved by involving NIC District Centers.
- In most of the cases the head of institutions were not aware of Digital signatures; this problem was over come through multiple decentralized trainings and district level support by NIC.
- System exploiter fraudulent institutions were identified and punished which established an image that portal has fraud detection mechanism and being monitored at highest level.

The Lessons learnt from the Process re-engineering exercise

- Coordination among stakeholders was the greatest challenge as different stakeholders had varying perception about their work. Involvement of the top leadership was required to achieve synergy. The Niyamawali has been framed by the Cabinet for defining each process for effective system. The Government Orders (G.O.) are issued and updated time to time for successful implementation of project. Roles and responsibilities of each stakeholder are clearly and strictly defined in various G.O.s.
- Capacity Building of the officers & concerned employees of universities/institutions of the state regarding work flow, operating, digital signature and their responsibilities to develop a feeling of ownership amongst employees.

Best practices adopted from the industry/ other State implementations

- The SAKSHAM web portal is hosted at SDC after security audit. The same can be used by other states after some customization since component based approach has been used for developing the portal.
- Multiple governments, educational, social, organizational entities are working together for a common interest of disbursing scholarship & fee-reimbursement and information exchange.
- There is no constraint of operating system or browser at the user end.

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
Book of Rules with the approval of Hon'ble Chief Minister was prepared & released to clearly define methodology, process flow and responsibilities of all stake holders. All the stakeholders are also supposed to complete their responsibilities/work well in time as per Government imposed time table.

Change management and Capacity building strategy
- The Portal is very user friendly the User need not require much expertise of computer.
- Department of social welfare also organized various workshops, training programmes.
- Help desk established for technical support of stakeholders.
- Seminar & workshop organized at Hon'ble Governor office.

Project management & Monitoring **adopted**
State, district, institute level committees have been formed to constantly monitor/ review the entire process.

Financial model adopted
- It is developed by NIC at zero cost.
- Student can seek help of any CSC.

Special efforts to ensure sustainability of the e-Governance initiative(s)
- Latest software and hardware have been incorporated for "SAKSHAM" which makes it fairly sustainable.
- The department of social welfare in association with NIC organizes various workshops/training programs at state and district level for educating the schools/institutes.
- Administrative setup appreciated huge saving of Government funds because of "SAKSHAM".

Challenges faced in transition
Changing of mindsets of the stakeholders was a difficult task, because they were well tuned with traditional manual operations.

The Lessons learnt from Change Management and Capacity building
- Master trainers should be identified from every group of stake holders, as they can make better understand their own officials.
- Teacher and staff awareness campaigns under leadership of District Magistrate are important at District level and thereafter; Teachers and academicians imparting awareness and knowledge to their students is the key learning for improvement of system.

Technology
"SAKSHAM" web portal has been developed by using the Microsoft technologies (SQL Server 2008 R2 & .Net 4.0, Web 2.0, JQuery)

- NET framework 4.0, IIS 7.0 at front and SQL SERVER 2008 R2 at back end for software.
- Client – Windows 8, Windows 7
- Browser - IE 8 &higher, Chrome, Mozilla Firefox

Compliance of the Technology adopted with e-Governance standards
The "SAKSHAM" web portal is already functional and hosted at State Data Centre after security audit. Web Application has been security audited by Third Party 'CyberQ Consulting Private Limited' and Cyber Security Division of NIC.SAKSHAM has been developed using following proper website security mechanisms.

Technology related challenges faced
Load balancing for website and database was difficult during last few days of time span fixed for filling application form.

VALUE INDICATORS
Digital Inclusion
- As "SAKSHAM" is a web based solution used by the students studying in 25000 institutions approximately, most of these institutions are Hindi medium so all the forms and help modules are available with Hindi labels.
- Head of institutions arranged their digital signature for the verification and authentication of the students which also established IT culture in the state of Uttar Pradesh.

Green e-Governance
Approximately 300 Lakh pages used as copies of application form and photo copies of documents were saved because of online end-to-end solutions and approximately 4 Lakh computer prints necessary for keeping the record at district level offices were also saved per year.

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End-to-End Election Management System
State e-Governance Mission Team (SeMT), Government of Kerala

Muraleedharan Manningal and Krishnan B. Nair

PROJECT OVERVIEW

The election scenario in India, as we all know, encompasses different strata of the society, viz., the common man (Voter), political parties, officials of Revenue, Police & other Government Departments, business community, civil police officials etc. Until now, the state-of-affairs were clearly dominated by factors like "urgency of situation with extremely tight time-limits", bound by very traditional & laborious manual processes, that often created many operational issues for the Government and its functionaries, as well increased expenses.

The "End-to-End Election Management System" for use in the election to the Kerala Legislative Assembly May 2016 was envisaged to mitigate the aforementioned inherent complexity of the election process by infusing ICT, thereby making the entire election process much faster & user friendly to all stakeholders. As such, the Web & Mobile based IT Solutions were developed & implemented in less than two months' time by Kerala State IT Mission for deployment in the 2016 Assembly Elections; the entire election process was streamlined that helped political parties, candidates and voters to great extent. The end-to-end needs of officials, Departments, political parties and citizens were covered by these applications: e-Anumathi, e-Pariharam, e-Vahanam, e-Voter(Mobile App), GPS based tracking of election vehicles. Apart from this, Web casting was also carried out successfully by Kerala State IT Mission to closely monitor the actual polling process on poll day.

IT-based solutions were being tried out as a path-breaking effort, and that too in a sensitive subject as General Election to the State Legislative Assembly.
The main objectives of the project were
- To save time and effort of the citizens and political parties by accessing the information and permissions from authorities online by eliminating the need for physical visits to Government offices
- Easier and smooth complaint handling so as to ensure transparency in the election process
- Provide webcasting facilities for close surveillance of sensitive polling booths
- Search facilitation in electoral rolls, polling booth and filing of complaints and implementation GPS based vehicle tracking via mobile
- Management of transport vehicles hired during polls

Key Challenges
- Time Constraints – Study, Development & implementation of all the IT Applications was successfully completed in 45 days time
- Integration with third party applications like National Electoral search database, achieved in short span of time

- Multiple Systems and procedures for issuance of permissions – SOP developed and implemented
- Training to Stake holders – Limited time, large volume of users

RESULT INDICATORS
Key Performance

Table: Key Performance

Name of application	Application Type	Service type
e-Anumathi	Web application	G2C, G2B
e-Pariharam	Web application	G2C, G2B
e-Vahanam	Web application	G2C, G2B
GPS based tracking of election vehicles	Web application	G2G
e-Voter	Mobile App	G2C, G2B, G2G

Table: Some statistics

No. of voters in the state	2,60,19,284
Usage of EPIC	100%
Total no. of Assembly constituencies	140
Total no. of Polling Stations	21,498
Polling Stations with Live webcasting	3137
No of users on e-Voter app	55,499
Electoral roll searches	Over 10 Lakhs
No. of re-polling	**0 (ZERO)**

Implementation coverage

All the applications & services were rolled-out over internet to cover the entire population of the state, wherever they were.

Benefits of the end-to-end applications
- Accurate, reliable and faster information
- All the information required for the voter at their finger tips
- Reduction in cost towards election monitoring and reporting
- Improved efficiency and collaboration across various departments
- Execution of free and fair poll with excellent transparency and connect with people

Outcomes in terms of Efficiency, Improvements and integration

These e-Governance initiatives were intended to replace the earlier manual operations and are integrated with the National Electoral Search database to provide a single window service.

ENABLER INDICATORS
Process reengineering

Multiple process improvement and reengineering led to the successful implementation of this technologically innovative application to support the

General election to enhance the transparency and conduct of free and fair poll with improved connect with People. Key process re-engineering activities considered as part of this programme are:

- Simplified processes and prepared standard operating procedures (SOP) which has been circulated with various departments involved in the election process such as Police and Revenue etc to bring standardisation and uniformity.
- Mandated online payment eliminating physical visits using online challans
- Leveraged technology to automate processes and real-time tracking and monitoring with automatic escalation based on set service levels.
- Implemented online complaint management system to enhance transparency
- Integration with National voter service portal to provide single window of services

Leadership, Change Management, Capacity Building during transition
Effective utilization of the State ecosystem with leadership support from Chief Election Officer and IT Nodal officer was pivotal in the implementation of this end-to-end election system. Following were the key considerations to ensure right capacity and capability with smooth management of the overall programme:

- Focused approach to establish District level master trainers leveraging Virtual IT Cadre in the initial stages of the programme.
- Leveraged technology such as Video conferencing for effective connect with various stakeholders
- Prepared and updated FAQs to enable various stakeholder with minimal hand-holding
- Strong governance : Regular review of the progress using trackers and dashboards at the level of KSITM Director , who is the Nodal officer for IT support during Elections and the Chief Election Officer

Technology
Considering the tight schedules, following technologies were used for the oveall election management programme:

- Web Applications: Leveraged Microsoft technologies (.NET and MS SQL Server)for developing the web based applications
- Mobile application: Developed using MySQL on Android and iOS platform. Mobile application is available from Android Play store.
- Leveraged Video conferencing with 2 control rooms in Trivandrum to monitor Election Day monitoring of selective booths.
- Effective use of SMS / bulk SMS for communication with various Polling officials in the state
- Tracking of official vehicles using GPS
- Use of SMS to monitor the polling progress during Election Day.
- Security Audit by CERT-K

VALUE INDICATORS
Some of the key achievements are:

- Execution of free and fair poll with excellent transparency and connect with people with no re-polling.

- KMA-NASSCOM "Best IT Innovation award 2016" for eVoter
- National Award from Skoch for General Election 2016 leveraging the ICT

Digital Inclusion

To provide all the envisaged services across all the voters, the applications were deployed over Internet. Language of all the web applications & the mobile app is English

Green e-Governance

Effective e-Adoption (Enhanced use of online and mobile application, use of Video-conferencing, mandatory online payments, standardized process etc) for end-to-end election has resulted in improving the carbon foot print and optimizing the cost.

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IT initiatives in Madhya Pradesh State Election Commission – A Paradigm Shift

MP State Election Commission, Government of Madhya Pradesh

Sunita Tripathi and Girish Sharma

PROJECT OVERVIEW

The journey started on 12th April 2014, prior to which there was absolutely non-existent IT infrastructure. Local elections are known as foundation pillars of democracy. The humongous task cut out for SEC involves returning the candidates for 401254 Constituencies in 23553 bodies. IT became one of the enabling tools for the change management process which mainly involved promoting measures which strengthened the environment for free and fair elections. The huge challenge before the Commission was to establish IT infrastructure along with the human resources, to train all the stakeholders concerned including large number of functionaries at the field level.

Commission took upon itself the challenge and the IT program was envisaged with an objective to develop the IT infrastructure, various applications and data entry forms (web forms) to manage various phases of elections and maintain an information flow between various levels and to train manpower and equip them with required IT skills. The strategic objectives of the initiatives were-

IT Infrastructure: Provide infrastructure that is secure, robust, reliable, and responsive to changing needs

Human Capital: Recruit, develop, and retain a highly capable workforce with competencies to support Commission's goals and objectives

Information: Improve information access to perform tasks timely, efficiently and effectively

IT Applications: Achieve and sustain effective, easy to use and integrated IT applications that support smooth election management

IT Security: Protect the Commission's knowledge and information systems to ensure integrity, confidentiality and availability

Services: Achieve and sustain a high level of satisfaction of stakeholders

Process Reengineering: Review the existing process and reengineer them to enhance efficiency and effectiveness.

For implementation of the project, 5293 field functionaries were trained for 371 hours, in house 13 core applications, 168 web forms were developed, deployed and successfully used. These applications were mainly in G2C, G2G category ultimately resulting in stakeholders being more informed to exercise their choices and with a considerable ease in work flow and transactions. "Transparency" became hallmark by providing the information of 186789 candidates to the 4 crore voters of MP, out of which approximate 80% of voters voted in the general elections. Our overall approach was to ensure participation of various stakeholders at different levels, to follow a process driven software development lifecycle to make sure quality and adherence to various industry and government standards and to follow a strong change management strategy to train various functionaries and

users on IT skills and applications. Our software development approach was to m form a dedicated in-house IT development team to develop and maintain applications. With IT department of Govt. of MP awarding top ranking award for innovations in SDLC (software development life cycle) category this year, Commission has planned many more such initiatives for the future, for implementing the core message of our logo i.e. "efficient and effective poll arrangements to facilitate the largest number of voters exercise their franchise for a vibrant democracy".

Following are few of our key learning from the various IT initiatives-

- Effective change management strategy and stakeholder engagement during various phases, are key factors for successful implementation of the IT initiative.
- Evolving and maintaining a structured process driven management strategy for both IT application development, their deployment and governance initiatives, is essential to ensure equality in deliverables and ensuring effective implementation. A structured approach and a well-defined software development process was followed and evolved in the Commission as part of the initiative.

RESULT INDICATORS

The primary task of the Commission is to conduct smooth and hassle free elections. The IT initiative was envisaged with an objective to use information and communication technologies to facilitate this. Our intended results indicators were defined in terms of achieving our objectives for voter list preparation, voter slip distribution, election planning, election conduct, candidate nomination process, poll day activities and result declaration etc.

Key Performance

Following are our key result indicators and their respective performance against plan-

Voter list preparation

Commission prepare voter list every year after revising it by following a due process. In the process, it provides opportunity to the voters to add their name, delete their names from the wards where they no longer reside etc. Commission also identifies duplicate voters and removes them from the voter list after following due process. Commission has developed an IT application Electoral Roll Management System to perform this task which provides various functionalities to cater the above mentioned needs. An electronic voter list database was built and revised every year. Various services provided under the application are both G2G and G2C in nature. Commission also imitated online voter registration service to the citizens and has already done a successful pilot at district Harda. Voter list search service was also provided to the citizens to search for their names in the voter list. Commission has already prepared and published the voter list for approximate 4.5 crore of the citizens of the state using this application and revising it every year.

Voters slip distribution

Commission decided to distribute voter slips to the voters before elections to inform them about voting day, their polling booth and provide them a document for identification during the Election Day. Voter slips were generated using the IT applications mentioned in above section.Commission was able to achieve almost universal distribution of voter slip. Voter slips was distributed to approximate 94% of voters in the general elections of 2014-15.

Candidate nomination

Candidate nomination information was planned to be captured for all urban bodies, Panchayats (except Panch). For general elections of 2014-15, Nomination details were captured online of 90225 numbers of candidates for various urban bodies, Zilla Panchayats, Janpad Panchayats. Numerical data for Sarpanch's and Panch's too were captured.Nomination information which includes details like name, address, education etc. was captured online for all candidates fighting elections for urban bodies and Panchayats. Beside nomination information, affidavits submitted by candidates were also uploaded into the database and made available on the website.

Election conduct

Various IT tools and applications were developed and used for efficient conduct of elections for all constituencies for both rural and urban bodies and to facilitate monitoring of various activities related to election planning and conduct. These applications were used by the election officials at various levels for smooth conduct of elections.13 applications developed and deployed for various processes related to conduct of elections. 168 MIS web forms were developed and deployed to capture the information at various stages to facilitate quick decision making and response time. Applications were successfully used to conduct elections for 23553 bodies, 401254 constituencies; to manage 160000 number of EVMs; 598 Returning Officer's (RO's) and District Election Officer's (DEO's) diaries, 494 Observer reports submitted online.

Information dissemination

One of the primary objectives of the Commission is to maintain transparency in conduct of elections. Information availability about various aspects of the elections and candidates in public domain play an important role in achieving this objective. With this in mind Commission decided to make all necessary information to the voters available on the website.72758 candidate affidavits are made available on website; 471 instructions, handbooks, reports etc. made available online on website. All Commission's instructions, circulars, orders etc. are available on website. Results of all elections held after 2014-15 are available on the website.

Voter awareness

Commission launched a voter awareness campaign SENSE (Systematic Education, Nurturing & Sensitization of Electorate). Various IT tools were used extensively for effective and timely monitoring of various activities performed under it. Information was captured about various activities performed under this program like- in various colleges 693 campus ambassador were selected and trained,

734 EVM demonstrations to voters, 446 training sessions for media, 181 meetings with PSUs, public institutions, scheduled banks, 85 meetings with district and block representative of political parties, 165 meetings with civil society organizations and other private sector organizations etc.;

Implementation coverage

Implementation of the various IT initiatives covered all districts of the State, all elections for both urban bodies and panchayats (except for elections of Panch). Followings are some statistical figures showing the coverage of the various activities conducted by the Commission-

- Software applications were used across the districts and blocks. All district election officers (DEOs), deputy district election officers (DyDEOs) and district e-Governance managers (DeGMs) were trained.
- Total 13 applications and 168 MIS web forms were developed and deployed in just one year.
- Nomination detailed of 90225 candidates was captured for urban bodies and Panchayats for general election 2014-15.
- Affidavits/Sarpatrak of all candidates (except Panch) captured online.
- Real time information flow was established between district offices and Commission. Various reports like DEO/RO diaries, observer reports, poll day information were captured online.
- Election results were declared online and made available to the public on website.

Various new features added subsequent to 2014-15 elections like content management system based website, single sign on for various applications, application to manage election materials etc.To take the initiatives forward, we have added and in process of adding many news services and features like-

- Material management system to capture election related material demands from the districts, fulfilment of demands from Commission and maintain inventory stocks. It is already live.
- Budget management system to capture budget demands of districts, verification of demands, budget allotment and reporting system. It is already live.
- Mobile app to enable voters to search their names in voter list, locate their polling booths and generate voter slip etc.
- GIS tool to facilitate district officials in election planning, polling station rationalization etc.

Outcomes in terms of Efficiency, Improvements and integration

Following outcomes are achieved through our IT initiatives-

- High satisfaction level of electors, candidates, election officials, observers and all stakeholders through efficient and easy to use IT applications.
- The previous system was manual, tremendous amount of effort to gather any information which was very expensive and time consuming. Transformation to IT has saved costs and effort in terms of travel, follow-ups, coordination, usage of manpower and other administrative resources.

- Real time availability of information at various levels.With the new initiative which involve extensive use of IT, the Commission was able to maintain a real time flow of information between various offices of the Commission. Availability of information acted as a key tool in conducting hassle free elections.
- Qualitative improvements in information transmission.
- Hassle free management of election process.
- Interactive communication between Commission and districts, observers, political parties, candidates, media etc.
- Online centralized database - retrieval for election records covering all election related attributes available in user friendly form for future analysis and comparisons.
- Electronically maintained voter listresulted in cost and time saving in comparison to previous manual methods of maintaining and revising it.
- Well trained human capital.

Specific innovative ideas implemented in e-Gov area and their impact on services

- Randomizing EVM machines, Polling parties and counting parties was a herculean task before deployment of the project given volume and extents of the elections. Various applications developed under the project for this purpose enable performing these tasks in a transparent and cost effective manner. These applications were used for randomization for all elections subsequent to 2014-15/
- The various Governance innovations done under this initiative like reduction in number of envelope used and multi post EVMs resulted in a major cost saving for the Commission.

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems

- All of our IT applications were designed by keeping design principals like interoperability and integration in mind. Various applications maintaining candidate nomination, election conduct, poll and counting day activities, election results etc. are integrated.
- An application platform called myMPSEC has been initiated to provide access to various applications from a single place. Single sign on is also being implemented as part of this initiative. Aadhaar seeding has also been initiated in the voter list to enable integration with external systems.

ENABLER INDICATORS
Process reengineering
As part of the IT initiatives many front end and back end process changes took place.

- The electoral roll preparation process was reengineered from manually driven to IT driven. Service level agency was appointed to perform the task and vendors were appointed at the district level to prepare voter lists

and take claims and objections from the voters. A successful pilot was done in district Harda to make the voter registration process online.

- The processes to get the information about candidates, their affidavits were transformed by capturing all this information in a electronic centralized database and make them available on website.

- Election results were maintained in silos individually for each election before commencement of IT initiatives. It was transformed and now the election results are maintained in single five year cycle and accessible from a single place/link.

- The processes which were used to collect information from various levels were also transformed and made IT driven. It is commission's responsibility to conduct hassle free elections and to maintain law and order. To achieve it, it is required to maintain a continuous and on time information flow between various offices of the Commission to get the information on time so that a quick response can be provided.

- Many other back end process reengineering efforts were taken place in last one year like development and implementation of budget and material management systems to capture district demand online. Before these initiatives, districts used to send their demands manually using letters which often lost or seldom reached Commission office on time. Also there was no transparency thus the delays in allotment and distribution.

- Non ICT process changes and innovations like multi post EVMs, photo electoral rolls and reduction in number of envelopes also implemented. Number of envelops used were reduced which resulted in a major cost saving for Commission. First time multi post EVMs were used to simultaneously conduct elections of various posts in a single polling station. First time photo electoral rolls were used in the State. An electronic voter database was built and used.

Challenges faced in implementing Process changes

Following are various challenges we faced during implementation-

- Since the initiatives were largely IT driven so the biggest challenge faced was very little familiarity with the IT in the functionaries at various levels. Conducting elections require involvement of functionaries from the Commission level to the grassroots levels. Thousands of officials are involved. To train them on new processes, tools and applications was a herculean task which was successfully done as part of our change management activities.

- Complexity of election process and resource management. The Commission is constitutionally responsible for conducting elections for 401254 Constituencies in 23553 bodies including both rural (Gram panchayats, Janpadpanchayats, and Zillapanchayats) and urban bodies (Nagarpalikanigams, Nagarpalikaparishads and Nagarparishads). Geographical spreads of the commission's activities include the whole State. At the time of elections, polling stations are established in far flung areas. It was a huge challenge to implement even a small process change for such large setup.

- Another major challenge was to deliver and implement planned changes in a very short time due to strict timelines imposed during general elections. Bringing the various functionaries on board and getting them trained was a big challenge which was successfully overcome by various change management initiatives like extensive trainings, continuous communication, detailed user manuals, feedbacks, tests etc.
- Information collection from all levels especially from the polling stations level was a huge challenge given their large numbers and other technical issues like unavailability of network etc.

The Lessons learnt from the Process re-engineering exercise
- Change management is the key factor for any successful implementation of any process change. Trainings, awareness sessions, help documents, technical support play an important role in ensuring successful implementation of process changes.
- Stakeholder engagement at all levels and during various phases of implementation of process change is another key factor without which no significant process change can be successfully done.
- Leadership support through the various phases of process change is crucial for successful implementation.
- Another key lesson learnt was to conduct a pilot first before rolling out the whole project. Pilot provides an opportunity to test the process change in a live environment.

Best practices adopted
- Preparing a change management strategy for successful implementation of the process change.
- Software development should be driven by well-defined software development life cycle process.
- Ensuring stakeholder involvement and engagement throughout the implementation.

Leadership, Change Management, Capacity Building
Leadership support for the initiative
Our IT initiatives got a strong leadership support from the very top and various other levels. Strong emphasis was given on using IT in various phases of conduct of elections by the top leadership. Continuous support was provided at various levels from Commission to districts. Leadership support from various sections was ensured by effective stakeholder engagement.

Change management and Capacity building
- Our change management strategy was formed by giving emphasis on rigorous and continuous trainings and capacity building. Trainings were conducted at various levels on basic IT skills and various IT tools and applications developed. Dedicated video conferencing facility was developed and used extensively for these trainings.

- Detailed user manuals were prepared for all applications and continuous handholding IT support was provided by the IT team.
- Trainings were conducted for 5293 field functionaries were trained for 371 hours. Various primers, handbooks, videos were prepared and made available on website.

Project Management & Monitoring

- Continuous project monitoring was performed to ensure timely execution of various IT initiatives. IT team was led by an IT consultant who provided project management support. Weekly review meetings were conducted with the Commission officials to track the progress
- Project plans were prepared and an Open source project management tool Project Libre was used for project management. Weekly status reports were prepared and shared with the leadership. Frequent demonstrations were given to the Commission officials to identify deviations in functionalities and change requests if any.
- Continuous communication and monitoring was maintained with district officials using video conferencing facility.

Financial model adopted

The whole IT initiative was self-financed. In-house development team was formed for software development and maintenance. State infrastructure like State data center, SWAN connectivity was utilized for hosting and network connectivity.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Sustainability of the IT initiatives was ensured by the-

- Continuous leadership support from various levels.
- Efficiency benefits coming out in result of the initiatives. These efficiency gains played an important role in garnering support from various levels of functionaries involved.
- Continuous emphasis on the capacity building and steps taken to enhance IT related skills of the various functionaries.

Challenges faced in transition

- Resistance to change which is a very common challenge faced in any transition phase. It was overcome by effective stakeholder engagement and involvement, emphasis on capacity building and etc.
- Applying the change management strategy and organizing trainings at such large scale and given the very limited availability of time was a major challenge. Dedicated video conferencing facility which was used extensively to conduct trainings and review meetings helped in overcoming this challenge.

The Lessons learnt from Change Management and Capacity building

- The change management strategy has to be planned and executed from the very start of the project. It should not just start from the very end but incorporated from the very start,

- Continuous and highly accessible IT support at the time of execution is essential to provide handholding support and to resolve various problems faced by officials and operators during application usage. On time resolution of the queries is crucial in winning trust and ensuring usage of applications.
- Emphasis has to be given on first developing basic IT skills of the functionaries.
- Continuous leadership support and regular monitoring is essential.

Technology

Technological solution adopted

Various IT applications were developed on Microsoft dot net framework using SQL Server as database. Steps taken to use open source technologies like AJAX, Google Charts etc. Applications were primarily developed for language Hindi. However steps were taken to provide bilingual support in Hindi and English in applications. Website was designed to be bilingual in both Hindi and English. Efforts were taken to follow 3 tier architecture during designing and development as much as possible. Third party libraries for SMS gateways, email service were also used. State infrastructure like State data center and SWAN connectivity was used for hosting and network connectivity.

In house IT team provided software application maintenance. Annual maintenance contract (AMC) was done for hardware and network maintenance. In house capacities were also developed to provide first level of hardware and network maintenance support. Efforts were taken to train section officers and operators to provide first level functional support for various applications.

Compliance of the Technology adopted with e-Government standards

Steps were taken to follow GIGW guidelines and design principals like scalability, interoperability etc., were kept in mind while designing the various applications. To maintain security, encrypted passwords were used and role based access management system was developed to provide access over application interfaces.

Strategy for Disaster Recovery

Regular backup for application databases and code are taken. Disaster back up support is provided by SDC (State Data Centre).

Impact and value-addition thru adaption of Social media

Social media tools like Facebook and Youtube were used. Facebook was used to enhance the outreach of the commission and engage citizens, candidates, officials etc. The Youtube channel was used to share and store training videos etc. Links to both are made available in website for easy access.

Technology related challenges

- A major technology challenge was to ensure availability of various applications on the poll day and during elections when thousands of officials, candidates, voters would be accessing them concurrently. To

make sure it, a third party load performance testing was conducted and certificate was obtained.

- It was challenging to collect information on poll day because of volume of information, number of polling stations and connectivity problems in polling stations due to their location (geographical spread). Many polling stations were established in far flung interior villages for Panch/ Sarpanch elections. Collecting information from these polling stations, situated in dark zones, and maintaining a quick response time was a huge challenge.

The Lessons learnt from Technology choices and implementation strategy
- Emphasis has to be given on software testing for various different test cases and perform load testing is crucial.
- Continuous IT technical support is essential for successful usage of IT applications.
- Maintenance strategy should be formed in the start of the project itself.

VALUE INDICATORS
Digital Inclusion
It is primary responsibility of the Commission to organize elections for all eligible voters of the state irrespective of language, cultural or demographic differences. Efforts were taken to develop all applications for language Hindi as Hindi is the local language in the State. Website was developed in both Hindi and English and various information, circulars, books etc. were made available in Hindi. Website was kept light so that it remain accessible even where slow networks are available. District e-Gov managers were utilized effectively to ensure information feeding from areas where the network connectivity is not available.

Green e-Governance
- Innovation to reduce number of envelopes used in election process reduces the numbers significantly thus resulted in saving of papers.
- Before our IT initiative information was sent from district and ground level to the Commission in papers. With the use of IT tools like e-Mails and MIS online data entry forms, the flow of paper between various offices of the Commission was reduced significantly.
- Multi post EVMs resulted in conduct of elections of multiple posts like Zillapanchayat member, Janpadpanchayat member, Sarpanch and Panch in the same polling station at the same time. Thus resulted in reduction in resource requirements and saved paper, power and all infrastructure resources in result.

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Smart Energy Infrastructure and Revenue Administration System (SEITRA)
Bihar State Power Transmission Company Limited, Bihar

R. Lakshmanan and Shailesh Kumar Shrivastava

PROJECT OVERVIEW

Smart Energy Infrastructure and Revenue Administration System is an integrated framework of web, mobile and GIS technology to manage electricity infrastructure and produce energy bills for the consumers. It provides not only the answers for macro-level planning but also state-of-the-art models to the government in the context of decentralized planning for sustainable development in rural areas. The billing software is easily configurable, allowing for maximum flexibility as business processes may change over a time, as well as being able to easily integrate itself with external solutions such as accounting, ATP, IVR, GIS and work management. Development of this projects involved creation of Single Line Diagram (SLD), scalable maps, digitization of distribution network (Sub-Stations, Feeders) and creation of spatial data and its integration with attributes and development of integrated energy infrastructure framework. The energy billing software facilitates preparation electricity bills, various modes of payments, allow customers better access to their billing and accounting information, and enhance user end security by configuring access rules for individual users. A mobile app has been developed for spot billing which generates electricity bills using Bluetooth printer. The mobile app has been integrated with e-Wallet system of bank for spot payment collection from consumer premises. SMS alert is being sent to stakeholders on every event and acknowledgement. Under Mukhya Mantri Vidhyut Sambandh Nischay Yojana a massive survey of 2.8 Crore families is being done using a mobile App to identify households where electricity connectivity has not reached yet. Online electricity bill enquiry, online payment through internet banking, credit/debit card, e-wallet of various providers etc. have been enabled for benefit of consumers in urban areas.

Geomatics–based Application Model for Planning Distribution of Electricity to Rural Entities is enterprise internet-based G2C/G2G decision-support system based on Service Oriented Architecture, which has access via intranet/ internet for authorized users. Spatial data includes distribution network comprising of substations, feeders, village locations & basic amenities associated with the Households. The project provides an efficient & effective tool for planning Rural Electric Distribution Network. It enables a faster response to the changing ground realities in the development planning, owing to its in-built scientific approach and open-ended design. The growth depends on making available adequate energy at reasonable cost. This rural electrification programme has been undertaken under seven Nischay programme initiated by Chief Minister, Bihar. Under RGGVY, electricity distribution infrastructure is envisaged to establish Rural Electricity Distribution Backbone (REDB) with at least a 33/11KV sub-station, Village Electrification Infrastructure (VEI) with at least a Distribution Transformer in a village or tola, and standalone grids with generation where grid supply is not feasible.

Mobile App has also been developed which helps to manage & monitor Scheme implementation and Construction projects across Bihar.

Features of the software include:
- Mobile and GIS based model for electrical infrastructure mapping and planning.
- Mobile based survey of connected and unconnected households so that electricity infrastructure can be planned accordingly.
- Mobile based application for project monitoring, handling grievances and monitoring execution of projects.
- Tracking the habituated defaulters in bill payment thus enhancing the revenue collection.
- Spot Electricity Billing through Mobile App.
- Building up appropriate Management Information System (MIS) for monitoring revenue collection in its totality, thus helping decision making.
- Establishing modern web-based interface for greater transparency between the Board and its consumers.
- Total interconnectivity for single-point monitoring of revenue collection.
- Generation of individual's energy bills and batch wise bill generation.
- To facilitate receiving of bill payment at counters.
- Provision of Offline bill payment.
- Display of energy bills to consumers on Internet information through SMS.
- Timely and effective data management and MIS.

RESULT INDICATORS

Key Performance
G2C Services:
- Spot Billing through Mobile App has reduced large of grievances.
- Integration of payment gateway with mobile app using Mobile Money service providers such as PAYTM like Wallet system is likely to provide ease of payment to consumers.
- Online Reporting for various formations for the organization.
- Improved grievance redressal system and maintenance of electrical equipments electricity networks.
- Generation of monthly energy bills for the consumers at the Division level
- Identification of Unconnected Households helps to plan required electrical infrastructure.
- Online billing and payment System facilitates efficient service to all consumers in urban areas.
- Spot Billing system helps to deliver governance services as door step through Mobile App.
- Transparent processes and effective data management has improved quality of services.
- Payment collection from premises of consumers
- Integration of SMS service for communication [Both PUSH and PULL Service]
- SMS alert and e-mail at every stages of process as mode of communication to stakeholders.

- Help Desk and Enquiry Facilities through Website.
- An effective grievance redressal system is in place to handle various grievance arising from consumers and it is also covered under RTPS act(Right to Public Service) which guarantee service within specified time limit. State has also enacted another act for grievance redressal which has a separate administrative structure to handle all kinds of grievances.

G2G Services:
- Reduction in data management effort
- Scientific planning of resources and electricity infrastructure using GIS technology.
- Real-time on-site monitoring of activities at various project sites.
- Spot Billing through Mobile App has reduced large of grievances.
- Online Reporting for various formations for the organization.
- Better revenue administration of the organisation as up-to-date collections is available through MIS reports.
- Integrated planning of activities related to power administration.
- Enhanced inventory management of equipments available at GSS, PSS and poles.
- Improved grievance redressal system and maintenance of electrical equipments electricity networks.
- Generation of monthly energy bills for the consumers at the Division level
- Identification of Unconnected Households helps to plan required electrical infrastructure.
- Online billing and payment System facilitates efficient service to all consumers in urban areas.
- Spot Billing system helps to deliver governance services as door step through Mobile App.
- Maintaining ledgers of each consumer at the division level and Calculating arrears and dues and incorporating the same in the bill
- Generating notices to the consumers as and when required and Generation of various statutory forms
- Reconciliation of dishonoured cheques
- Online and Offline mode of operation suitable for remote areas where connectivity is still issue to be resolved.
- GIS technology to plan electricity infrastructure and new facilities.
- Onsite monitoring of projects regarding progress of schemes and quality parameters.
- Aadhaar Integration for identification of Consumers and reduce duplicates.
- Mobile based system for inventory management of equipments on 33KV/11KV Poles
- Tracking the habituated defaulters in bill payment thus enhancing the revenue collection.
- Total interconnectivity for single-point monitoring of revenue collection.
- GIS based electricity network to be used for planning overhead optical fibre connectivity under Digital India programme for connectivity up-to panchayat level for delivery of digital services to remotest villages.

G2B Services:
- Integration of payment gateway with mobile app using Mobile Money service providers such as PAYTM like Wallet system is likely to provide ease of payment to consumers.
- Revenue sharing model for bill payment

Year-wise transaction volumes for various services

Table: Services from last years

Sl. No.	Services	2015-16 (Till Date)	2014-15	2013-14
1	Energy Bills to the Consumer	58,40,000	70,45,000	7,30,000
2	Electricity Connectivity Details	1,02,00,000	46,00,000	---
3	Project Details	6,00,000	5,00,000	1,00,000
4	Electrical Asset Details	8,00,000	7,00,000	2,00,000
5	SMS Support	1,56,30,000	1,46,30,000	18,40,000
6	Helpdesh/Grievances	20,34,000	11,43,000	6,34,000

Implementation coverage
Comprehensiveness of reach of delivery centres
- 38 Districts of Bihar
- 534 Blocks of Bihar
- The North Bihar power Distribution company (NBPDCL) has spreads in 21 districts, 7 Circles, 28 Divisions, 87 subdivision and 334 sections.
- South Bihar power Distribution company (SBPDCL) has spreads in 17 Districts, 9 Circles, 37 Divisions, 109 subdivision and 271 sections.
- Citizens of Bihar State through Web Site   https://nbpdcl.co.in/and https://sbpdcl.co.in/

Implementation Strategy
- Roll-out of project has been done on PPP model.
- NIC has been entrusted to develop software solution and create hosting infrastructure for the applications.
- Field Engineers have been trained in batches to operate the system and ensure project completion as per specified time-line.
- Private companies and Service providers at field level have been trained to operate the software
- Field engineers have been trained for using mobile App for data collection and inspections.
- Other staff of district administration such as IAY Supervisors, Panchayat Rozgar Sevak has been trained to operate mobile app for data collection.
- Officers at the Rank of AE/EE have been trained to monitor progress of the project.
- A policy making body has been created under chairmanship Principal Secretary. Energy Department to formulate high level policy decisions.
- Required Hosting infrastructure has been created at State data centre as well as NIC data centre.

- Meter Readers as well as RRF has been recruited for spot billing and payment collection.
- Agreement has been signed with banks for e-Wallet Service so that payment can be collected from consumers.
- Massive recruitment of Engineers has been carried out to fill the gaps.
- Training for the stakeholders has been initiated.
- Regular Electricity Grievances Shivir has been notified where consumer grievances can be addressed.
- A toll free number and Project management Unit has been established for grievance redressal.
- Integration with PAYTM, CSC portal for Bill generation and Bill Payment

Outcomes in terms of Efficiency, Improvements and integration

- Reduction in data management effort with standardized practices in place.
- Scientific planning of resources and electricity infrastructure using GIS technology has resulted in reduction of biasness.
- Real-time on-site monitoring of activities at various project sites has improved quality of inspections.
- Spot Billing through Mobile App has reduced large of grievances.
- Integration of payment gateway with mobile app using Mobile Money service providers such as PAYTM like Wallet system is likely to provide ease of payment to consumers.
- Online Reporting for various formations for the organization helps to take efficient decisions
- Better revenue administration of the organisation as up-to-date collections are available through MIS
- Integrated planning of activities related to power administration.
- Enhanced inventory management of equipments available at GSS, PSS and poles.
- Improved grievance redressal system and maintenance of electrical equipments electricity networks.
- Identification of Unconnected Households helps to plan required electrical infrastructure
- Various analytics reports can be generated through the system regarding consumer behaviour.

The extent of integration

- The software has been hosted at State Data Centre/NIC Data Centre
- The software uses mobile Seva Platform MSDG for delivery of PUSH and PULL SMS service
- The software is accessible on SWAN/NICNET
- Integration with Bank has been completed for collection of Payment from Consumers.
- The grievances system is integrated with RTPS under right to public service act and Right to Pubic Grievances Redressal Act in the state.
- The common Service centres have been entrusted to collect payment of electricity bill from rural citizen.

ENABLER INDICATORS
Process reengineering

Table: New and Earlier system at different parameter of reengineering

Sl. No.	Parameter	Earlier System	New System
1	Quality of Reporting	Incomplete and Biased	Near Accurate
2	Reporting Lag	2 to 3 months	Up-to-date
3	Frequency of Visit/Inspection	4 Months or more	As per time schedule specified
4	Quality Enforcement / Monitoring	Poor Quality Data	Best quality data with supporting evidence
5	Energy Bill Submission	4 to 6 Months Lag	Up-to-date
6	Transaction Volume	Very less	Now in Crores
7	Online Data Updation	2 to 3 months behind	Up-to-date
8	Validation of Schemes	Limited Validation	Online Validation Procedure
9	Automatic Preservation of Inspection Details	Not Available	Good Quality Records being maintained
10	Transparency	Less Transparent	Transparent
11	SMS Alert	Not Available	Transaction based SMS Alert

Challenges faced in implementing Process changes
- De-regulated and delayed bill cycle resulted in loss to the organization.
- Previous meter reading data on the sheet prompted many Meter Readers for intentional manipulation.
- There was no verification of the full ledger prepared by the Agency at the Division level.
- Consumer ties up directly with the Agency to manipulate their arrear figures.
- The consumer may have to visit two or three times to the Division for correction in the bill.
- Handling consumer grievances and issue of duplicate bills, if required, was at the mercy of the Bill Clerks.
- Consolidation and collation of collection figure at Counter, Division and Board headquarters was very cumbersome.
- There was no control or ownership of consumer database on power consumption and payments.
- Whenever top management required any report, the Division used to pass it on to the respective Agencies. As different agencies were involved for different

- Report hardly got prepared on time due to involvement of multiple agencies at division level.
- Consumer grievances with respect to their bills could not be addressed properly.
- Need for adoption of scientific method using GIS for planning and execution of power projects.
- Need for enabling services through multi-channel delivery system like SMS, Mobile App, IVRS etc.
- There was hardly any system of inspection of projects being carried at remote site.
- Enforcing field visit for field engineer was tough to implement.
- Handling consumers at the counter was a slow process due to manual activities.
- There were long queues at the counters and the long delay to complete the payment formalities for a consumer.

The Lessons learnt from the Process re-engineering
- SMS alert is being sent to consumer for payment details.
- Infrastructure planning is being done scientifically rather than just of recommendations.
- Payment Collection from premises of Consumer is being now facilitated.
- Spot Billing through Mobile App has reduced large of grievances.
- Improved grievance redressal system and maintenance of electrical equipments electricity networks.
- Identification of Unconnected Households helps to plan required electrical infrastructure.
- Online billing and payment System facilitates efficient service to all consumers in urban areas.
- Spot Billing system helps to deliver governance services as door step through Mobile App.
- Transparent processes and effective data management has improved quality of services.
- Integration of SMS service for communication [Both PUSH and PULL Service]
- SMS alert and e-mail at every stages of process as mode of communication to stakeholders.
- Help Desk and Enquiry Facilities through Website.

Best practices adopted
- Use of Open Source Technology
- Mobile based Governance for service delivery
- Online as well offline version of Mobile app so that they can use as per availability of connectivity.
- Open APIs for inter-operability
- Aadhaar integration for consumer identification
- Banking integration for up-to-date fund position.
- Integration of GIS technology for location specific decision making.

Leadership, Change Management, Capacity Building during transition
- Sanction of project funds and establishment of objective of the project.
- Sharing of domain knowledge and management objective.
- Keeping citizen at centre all the policies has been created.
- Efficient grievances redressal mechanism has been adopted.
- Use of new and emerging technology to take technical edge.
- Adoption of best practices prevailing the field.
- Re-orientation of policies and re-notification as needed.
- Team motivator and clear cut conviction for the project.
- Conviction that ICT can bring about improvement in various kind of losses.

Change management and Capacity building strategy
State Project Core Team: NIC, Bihar and BSPHCL, Government of Bihar has notified officers as Project Members of project team. This also have members from administrative officers, executive engineers, Database Administrators etc who advices and assist during project implementation. This team is supported by a team of hired programmers well versed in adopting online web applications, GIS, mobile applications and provides technology implementation of the Project. This team work under overall supervision of Chairman, BSPHCL cum Principal Secretary, Energy Department, Government of Bihar, MD BSPTCL, MD NBPDCL, MD SBPDCL and State Informatics Officer, Bihar. The project team consists of officers nominated by NIC along with hired programmers well versed in application development using technologies such as web applications, GIS applications, Mobile Applications, other multi-channel delivery Systems.

Project Steering Committee: In order to support project it is necessary to create and train a group of resource persons who can work at HQ level and oversee progress of project and ensure smooth operations at field level. An ICT cell has been created with hired manpower and domain experts i.e electrical engineers. These people have been trained on using application by Central Core Bihar team. These people not only co-ordinate with stakeholders but also interact with field formation for collecting data. In addition the cell motivate decision makers to use ICT in decision making process and create a ICT enabled environment for planning and monitoring. The Project steering committee is headed by MD, BSPTCL and co-chaired by MD NBPDCL and MD SBPDCL. This has Project Coordinator, NIC, Chief DBA, Chief Engineers of company, DGM (IT) etc. as members.

Resource Persons at District/Division level: In order to support project at district/division and Block level large chunk of data has to be uploaded regular basis various kinds of resource persons have been hired or recruited. Project is being executed in PPP mode both field engineers and resource persons of service organization work together to achieve the objective of the project. Kind of Parameters required at decision making is being identified by the field formations but it is being aligned with organization objective at HQ level. Field officials dealing with data have been trained and equipped both for uploading data, data standardization and also they can use ICT as a tool for decision making. Proper h/w and software infrastructure has been created at field formations for updating data.

District Informatics Officer/IT Manager has been trained to use the application and provide technical support to the Project.

Workshops on adoption of latest technologies: Workshops have been conducted for various stakeholders of the project to make them understand about available technologies and best practices   In order to support project at division/district and Block level large chunk of data has to be uploaded Servers at regular basis numerous training programme has been conducted by Master trainers. Currently there is emphasis is on using Mobile technology to deliver services and gather data from field formations. In addition regular training programme has been conducted through video conferencing.

Project management & Monitoring

Following committees have been created by Energy Department, Government of Bihar for monitoring long term objective and progress of the project.

- **State Level Apex Body:** This has been constituted under chairmanship of Chief Secretary, Bihar with Development Commissioner, Principal Secretary, Energy Department cum Chairman BSPHCL, Secretary, INFORMATION TECHNOLOGY, MD BSPTCL, MD NBPDCL, MD SBPDBL, State informatics officer, MD, BELTRON as members.
- **State Level Steering Committee:** This has been constituted under chairmanship of Chairman BSPHCL with MD BSPTCL, MD NBPDCL, MD SBPDBL, Chief Engineers of power utility companies, Two Representatives from divisions and Project Coordinator, NIC, Bihar as members.
- **District Level Executive Committee:** This has been constituted under chairmanship of District Magistrate of respective district of Govt. of Bihar with Executive Engineers, IT Manager, Two Representatives of Blocks and DIOs/ADIOs of NIC as members.

Financial model adopted

The project has been implemented in collaboration with NIC, Bihar State through NICSI (National Informatics Centre Services Incorporated), a section 25 company under NIC, Department of Information Technology, and Ministry of Communications & IT. This is to facilitate appropriate provisioning of outsourced services required for the project. However, NIC is single point coordination for project development & execution for the State Govt. In order to facilitate data entry operations data entry agencies have been hired at division level. BSPHCL has also hired a set of programmers and Operation Assistant to support day-to-day operations. As implementation task is huge of its kind and time bound it is difficult for single agency to manage entire activities across Bihar. Entire funding for the project is done through BSPHCL. Project funding has been done at regular interval in terms of Manpower, H/W resource, Software support etc. Various agencies have been hired for performing spot billing and RRF have been hired for collecting payments from residential complexes. MOU has also been signed with banks such as ICICI and PAYTM for making on-line payments or using e-Wallet System. Most of the contracts are done on per transaction basis levied to the consumer. A sum of Rs. 3.56 Crore has been sanctioned for executing the project for three years.

Special efforts to ensure sustainability of the e-Governance initiative
- Software has been security audited through DeiTY empanelment agency.
- The cost of the project is automatically recouped with transactional cost.
- The third party agency is being recruited however performance audit performed by CAG and their recommendations have been adopted in the software.
- Infrastructure has been created at levels for running the software and all levels of employees have been trained to operate the system.

Challenges faced in transition
The selection of ICT systems and tools should be based on long term strategic and business continuity perspective. The following factors were critical in ICT implementation:
- Adoption of open architecture and adaptive communication network based on proven standards and specifications
- Consistent infrastructure for data collaboration, communication and interoperability
- Authentication and role-based access to the network
- Robust and scalable architecture to support large volume of transactions
- 3-tier architecture for easy modifications of business logic and SW deployment
- Availability of internet connectivity in rural areas
- Platform-independent application components for easy migration to new platforms
- Disaster Recovery and Continuity Planning

Globally ICT is being used to enable operations at a transaction level thus providing advantages like inbuilt process controls, workflow enabled transactions, single point of data capture and support for timely strategic decision making. On the other hand, the core operations are still manual and therefore face issues like ad-hoc decision making, poor data quality, long decision making cycles and under utilization of IT investments. Therefore, ICT has to be selectively adopted as a business strategy to improve commercial and operational performance. The need is to develop a synergy between ICT and the Power Sector; and emerging technologies can play a defining the role in profitability and quality of services.

The Lessons learnt from Change Management and Capacity building
- There is need to automate the processes and the processes should be notified at regular basis.
- There should be continuous monitoring of events and activities from top level management.
- The choice of technology should be well tested as it may take much longer period to shift from one platform to another.
- Open platform should be promoted with proper inter-operability framework.
- Permanent cadre of IT professionals is needed for time critical applications.

- Hybrid model of outsourcing and in-house management is necessary for large projects.

Technology
Technological solution adopted

Table: Technological solution Hardware and Software

Sl. No.	H/W and Software Specification	Name of H/W and S/W
1.	Servers & Desktop	High End Blade Servers, Local servers, Desktops
2.	OS	Windows 2008, Windows 7 & XP
3.	DBMS	SQLSERVER 2008, Oracle 10G
4.	Web Server	IIS 7.0 , Apache-Tomcat Server
5.	Framework	.net Framework 4.0, Java
6.	IDE Software	Visual Studio 2010, NetBeans, Java Script
7.	Reports	Crystal Reports
8.	SMS	Mobile Seva of DEITY and NIC SMS Gateway
9.	Mobile App	Android based Java Application
10.	GIS/GPS Mapping (Spatial Data)	Silver Light, ARC GIS Server
11.	Unicode Support	Indic IME, Google API
12.	Video Player	Adobe Flash Player

Compliance of the Technology adopted
Most of the reports and data are available in Unicode so that people are able to access the services in local language. Software is most effective in providing complete details about various processes, monitoring day-to-day operations, reporting from each district/block through SMS. This increases faith of stakeholders and enforces guidelines of department. A high-end database configured to support large number of concurrent users has been established. Mobile Seva SMS gateway has been integrated to deliver sms services.

Strategy for Disaster
The site has DR site at Gaya connected through 34 MBPS leased line and it is also planned to create near DR centre at Patna itself.

Technology related challenges
The following factors were critical in ICT implementation:
- Adoption of open architecture and adaptive communication network based on proven standards and specifications
- Consistent infrastructure for data collaboration, communication and interoperability
- Internet connectivity at remote locations
- Battery backup of devices
- Authentication and role-based access to the network
- Robust and scalable architecture to support large volume of transactions

- 3-tier architecture for easy modifications of business logic and SW deployment
- Platform-independent application components for easy migration to new platforms
- Disaster Recovery and Continuity Planning

The Lessons learnt from Technology choices and implementation strategy

Adoption of open architecture and adaptive communication network based on proven standards and specifications. Geomatics–based Application Model for Planning Distribution of Electricity to Rural Entities is enterprise internet-based G2C/G2G decision-support system based on Service Oriented Architecture, which has access via intranet/ internet for authorized users. Spatial data includes distribution network comprising of substations, feeders, village locations & basic amenities associated with the Households. The project provides an efficient & effective tool for planning Rural Electric Distribution Network. It enables a faster response to the changing ground realities in the development planning, owing to its in-built scientific approach and open-ended design. The growth depends on making available adequate energy at reasonable cost. This rural electrification programme has been undertaken under seven Nischay programme initiated by Chief Minister, Bihar.   Under RGGVY, electricity distribution infrastructure is envisaged to establish Rural Electricity Distribution Backbone (REDB) with at least a 33/11KV sub-station, Village Electrification Infrastructure (VEI) with at least a Distribution Transformer in a village or tola, and standalone grids with generation where grid supply is not feasible.

The project is being roll out across the State through BSPHCL and its power utilities. Rs. 3.56 Crores for next three years. The project is being implemented through NICSI and other out sourced companies. For capturing of family survey of 1.8 Crore families various staff working in rural development department have been used/. Departments have already sanctioned for its officers/staff to procure Mobile devices as per specification to run the application. The hosting infrastructure is being created through NICSI by NIC. State data centre/NIC data centre is being used for hosting applications. The software has been developed by NIC/NICSI with domain knowledge sharing by BSPHCL and its power utilities.

VALUE INDICATORS
Digital Inclusion
In order to make application reach to masses local language interface in Unicode has been added so that information so provided can be used by large set of people. Applications are accessible both for citizen and for government functionaries as per needs. Application has been hosted on internet to facilitate large number of public to access the services. Easy navigation facilities, help files make it accessible to larger audience.

Green e-Governance
Following measures have been taken for green e-Governance:
- The project has tried to popularize its motto of **"THINK BEFORE PRINT - save trees"** among stake holders and citizen.

- Mobile app has been provided for most of the enquiries and grievance redressal.
- Special care has been taken to reduce number of maps which can be printed.
- Special training sessions are conducted for participants on Green ICT and its impact.
- Adjust settings of IT systems to save power when not in use for short periods.
- SMS alert and Online enquiry is being promoted rather than printing paper outputs.
- Use virtualization on servers, when available, to allow multiple operating systems to run on each machine.
- Web GIS application can reduce printing requirements as most of the dynamic map requirements are serviced through Application itself.

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UE Mission

Rural Electrification Corporation Limited, Government of India

Dinesh Arora and R. K. Gupta

PROJECT OVERVIEW

The UE Mission also known as Grameen Vidyutikaran mission focusses on electrification of the remaining 18,452 un-electrified villages in the country in 1000 days as promulgated by Hon'ble PM Shri Narendra Modi on 15th Aug 2015 during his Independence Day speech from the Red Fort. These villages are located in remote and far-flung corners of the country which require strenuous efforts to electrify these 18452 villages. To accomplish the work within specified time the task was assigned to REC on mission mode. REC has a past prosperous record of effectively finishing the 'Swachh Vidyalaya Abhiyan' through milestones-based online monitoring and extensive field visits by the local staff. To viably finish the mission on time with requisite quality of work, 12 standard milestones were defined for completion of electrification work in a UE village.

Though the electrification mission appeared un-agreeable with conventional approach, therefore based on earlier experience a strategy to micro manage things with utilization of innovative technology was evolved. This took the shape of a complete project monitoring mechanism in the form of GARV App. The GARV App was launched by Hon'ble Minister of Power on 14th October, 2015 with a purpose to bring in execution speed, transparency &accountability in village electrification works. It was designed to track minute-to-minute progress of village electrification, better coordination and resolution of implementation issues, enhanced transparency and to help disseminate information to all stakeholders, including the general public at large.

The App is driven by GVAs (Gram Vidyut Abhiyantas) who are the bare foot soldiers of the Grameen Vidyutikaran mission, they visit the villages where the electrification works are under progress or are to be carried out and monitor the progress in terms of 12 predefined milestones. The GARV App provides GVAs with the interface to capture the progress of works based on milestones achieved along with supporting photographs. This information is compiled based on different monitoring parameters and is made available on the GARV dashboard after necessary approvals.

Planned coverage & current status:

- As on date, 10694 villages have been successfully electrified in respect of 18452 total un-electrified villages and 136595 i.e. 60% milestones have been achieved.
- The benefits of post deployment can be seen from the progress

Figure: Village Development

achieved in electrification of villages which is **7108** electrified villages during 2015-16 and additional **3586** villages electrified till date in the current financial year as compared to 1405 electrified villages during year 2014-15.

Key Learning's from the project:
- Milestone-based monitoring of any work is a more effective means to achieve the goal
- Technologies like mobile app facilitate convenient capturing of real-time data and also provide greater transparency.
- The mobile app has also provided for paper-less working which reduced the efforts and time taken for capturing data and for effective monitoring

The project monitoring methodology adopted for UE mission in the form of GARV App is unique example of E-Governance as it enables, participation of general public in monitoring a government program and makes the administration transparent and accountable to accomplish the target in given timeframe.
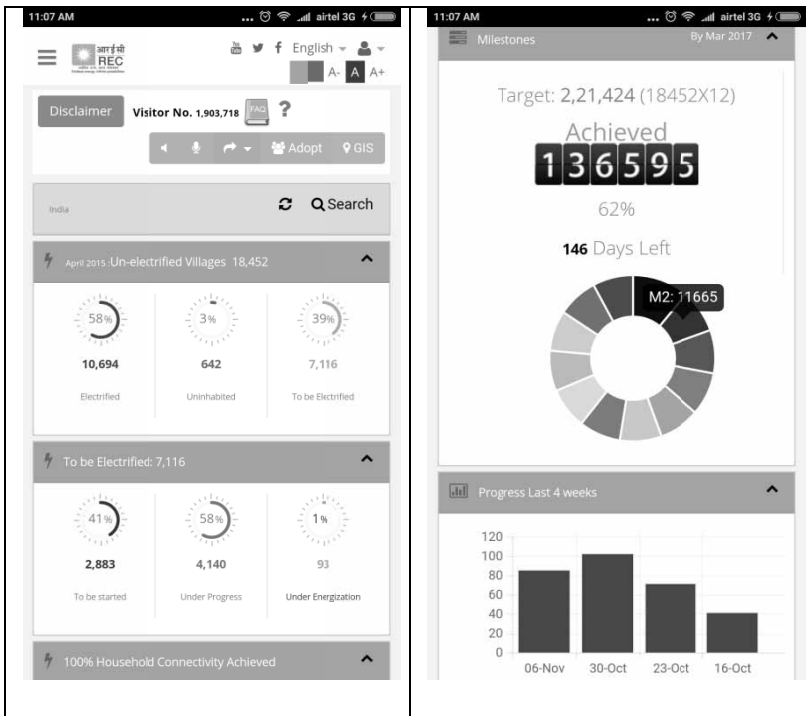
Figure: REC App

RESULT INDICATORS
- The launch of the GARV application has taken into consideration seeing the status of electrification at national, state, area and town levels on a solitary stage. This has decreased time and effort in gathering and confirming

information from different sources for monitoring purposes, as was done before deployment.

- The available accessibility of milestone-based information alongside contributions from the GVAs on the genuine ground-level conditions has prompted better distinguishing proof of bottlenecks and defers, accordingly inciting speedier activity by monitoring agencies such as REC project offices and state DISCOMs.

- Milestones designed for both Grid and Off-grid projects are unmistakably characterized and give a superior approach to track advancement of electrification. Taking pictures of milestones guarantees more prompt work by contractors and more prominent to quality of requisite works

- The collection of village-level visit information by Gram Vidyut Abhiyantas (GVAs) has prompted close monitoring at a phenomenal level, rather than depending on information given by state utilities alone.

Key Performance

The GARV App provides services in the form of information through its various components**:**

- *The Dashboard***:** The dashboard shows the entire information of all 18452 villages covered under the mission, showcasing the status of electrified villages, to be electrified villages etc. on real time basis at State, District and Village level. The information is represented on dashboard in different categories, viz. Milestone based progress, Weekly progress, Progress in grid & off-grid villages and under different plans. The dashboard also has GVA information available publicly to make the reporting process transparent and making them accountable for their visit reports.

- *GVA Login***:** GVAs upload all the information of a village captured during their visit to the villages. This comprises of details of existing and new infrastructure, milestone based progress, photographs of the landmarks and work in progress.

- *GIS/Asset Mapping***:** It provides the ground level view of location of every village/district and its assets (viz. the DT (Distribution Transformer), LT Line, and HT line, etc.), which facilitates realistic analysis and decision making.

- *Village Adoption***:** This interesting feature empowers the user to choose one or more than one State/District or Villages of their choice and get regular updates regarding progress of works in chosen villages.

- *Multilingual***:** GARV App is multilingual to make the app understandable and easy to use by the general public.

- *Social Media integration***:** Social media tools like Facebook, Twitter, YouTube and Instagram have been integrated to create awareness among people increase the transparency.

- *Feedback Mechanism***:** To ensure a two way flow of communication we have feedback and suggestion feature to ensure our stakeholders including general public can provide valuable feedback. The emails thus received are responded to in timely manner and necessary action is also ensured.

- *Accessibility Features*: The GARV app also provides the accessibility features viz. text to speech and voice based search for people with special abilities.

Implementation coverage
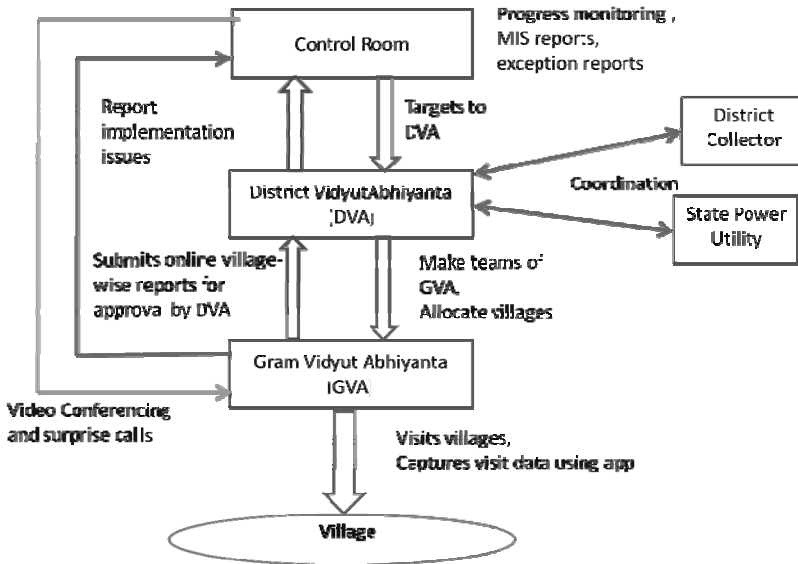
Figure: Implementation Framework

The Control Room
- Plans state-wise or region-wise targets for village inspections
- It reviews the progress of inspection and gives final approval to the online reports submitted by the GVA.
- It generates MIS reports, exception reports and tackles reasons for delays
- Conducts periodic video conferencing with Gram Vidyut Abhiyanta/ Regional Vidyut Abhiyanta/District Collector to monitor the progress
- Gives surprise calls to RVA/GVA for monitoring

The Regional head/RVA
- Allocate teams of GVAs to conduct village inspections in order to achieve the target given by the Control Room using the online portal/mobile app
- Online checking and approval of village inspection reports submitted by the GVA
- Take regular reports from utilities and update village electrification status

The GVAs
- Visit at least 10 villages per week
- Monitor the milestone-based progress including photographs of works depicting stage of execution of works and quality of executed works
- Ensure quality surveillance of completed works

- Submit online village inspection reports for approval
- Coordinate between DISCOMs, District Administration and REC and alerting RVA/ Control Room on slippages in schedule of award, implementation and completion of projects

The approximately 375 GVAs already deployed have been trained to use the GARV app to capture data.

Outcomes in terms of efficiency, Improvements and integration:
Village Adoption: Through this feature, anyone can adopt one or more villages, districts or states to track the progress of electrification in them. Using this feature anyone can receive notifications whenever any village(s) out of the adopted villages is/are electrified. Anyonecan view their customized 'Adopted Village(s) Dashboard' to specially track those village(s)/District(s) or State(s) they have chosen to monitor by viewing the milestones achieved in them. Multiple stakeholders monitoring the electrification progress in these villages will enhance the transparency and speed of work and ensure that the quality of work is maintained.

*GIS/Asset Mapping:*In collaboration with Bhaskaracharya Institute of Space Applications & Geo informatics (BISAG) under the Digital India initiative of Govt. of India developed the "GARV-GIS": A GIS mapping module for mapping power distribution infrastructure in these villages. GARV-GIS has the following features:

- Mapping of all 18452 UE villages (Latitude- Longitude) on India map depicting real time status of electrification with overview of electrified & yet to be electrified UE villages.
- Access to village data sheet in Garv App from India map.
- Tools to plot Distribution Transformers, HT Lines, LT Lines and landmarks in the village on India map.
- Additional information such as:
  - Associated Census data (population etc.)
  - Main Rivers and water bodies
  - Main Railways and Roads links
  - Infrastructure view
  - Landmarks
  - Legend
  - Functionality to measure distances and calculates area of a selected region in the map.
  - 3-D view (for estimation of Hilly Terrains)

ENABLER INDICATORS
Process Reengineering
The earlier system involved providing electrification progress data in terms of number of villages electrified during the month by State Distribution Companies, which had high possibility of errors and the pace of work was also very slow. This can be seen from earlier year data as only 1405 villages were electrified in year 2014-15.

The level of transparency provided by GARV app makes it unique and generates interest of general public to track status of works being executed by government agencies in the remotest and inaccessible villages of the country. It is the only App which provides such objective monitoring of works on the dashboard with clear indication of status of electrification works in individual villages. Earlier manual methods were used to track progress of electrification works only in terms of no. of villages but GARV App tracks every single village with its unique census code, status and landmark photographs. This entire monitoring framework has sensitized every level of governance from Top to bottom in terms of accountability and transparency which has led to speedy execution of works and early resolution of issues. This transparent approach to provide true picture to people through individual village wise status along with photographs has strengthened faith of people in government programs.

Change Management & Capacity Building Perspective

The implementation of new Project Monitoring System in the form of GARV App was done to overcome all the weaknesses of the earlier system in terms of use of technology, milestone based reporting, deploying trained manpower, transparency, teamwork and involvement of all stakeholders to achieve the ultimate goal well ahead of given timeline.

- *Gram Vidyut Abhiyantas(GVAs):* More than 350 young electrical engineers have been trained and deployed in these 18452 villages for regular visits to these villages to independently capture the progress of electrification works in the GARV App along with reason for delay if any.
- *Technology:* The latest mobile technologies have been used to develop project monitoring system in the form of GARV App. The GVAs have been provided with Android based Tablets to capture the status of electrification work along with photographs.
- *Milestone based reporting:* The entire process of village electrification has been divided into 12 milestones to objectively monitor the progress of works.
- *Training:* The GVAs have been trained regarding the use of GARV app to capture the progress of works. Routine workshops are also conducted to motivate the GVAs and to equip them with the latest developments and acquaint them with quality aspects of the electrification.
- *Teamwork:* The entire work is being done as Team India comprising of all stakeholders viz. Central & State Governments, Ministry of Power, REC& executing agencies. For coordination with GVAs regional level and head office level teams have been formed to effectively monitor the project. The GVAs regularly interact with district administration and executing agencies to apprise them regarding the progress of works and resolution of issues if any.

Social Media Platforms for Project

GARV App is available on all major platforms viz. Android, Apple iOS and Windows. A web interface is also available for the App and it can be accessed at "garv.gov.in". GARV App has 1903644 visitors till date. The App is freely downloadable and has registered more than 62,756 downloads on Android platform

and approximately 7494 downloads on Apple iOS platform. Apart from GARV app, we also have a dedicated grievance redressal cell to handle general public grievances regarding electrification of their village on daily basis. TheGrameen Vidyutikaran mission is active on Twitter as well as Facebook to reach out to general public and increase public participation. The mission has 150000+ likes on Facebook (www.facebook.com/grameenvidyutikaran) and 4700+ followers on Twitter (www.twitter.com/grameenvidyut).To increase the public engagement and for valuable feedback from general public, our Executive Director Dr. Dinesh Arora, IAS recently conducted two question answers sessions on Facebook which were very encouraging and motivating.

Table: Transaction Volume

Name of Service	Volume of Transactions (Nos) during last one year
No. of villages visited	17,292 villages
No. of visits to villages	54,039 visits
No. of photographs captured & available to ensure Transparency	1,62,100 photographs (approximately)

VALUE INDICATORS

UE mission especially the GARV App has applauded by Hon'ble Prime Minister on different platforms in India & abroad. During his address at HT Leadership Summit 2015 in Delhi he talked about GARV as a monitoring mechanism to achieve the electrification of 18452 villages in 1000 days, he even motivated audience to install the App to track progress of works. At Brussels, Belgium he appreciated the App to successfully incorporate maximum transparency & accountability in govt. working. At Nairobi, Kenya he again applauded the app for providing minute to minute status of electrification works in remote corners of India. He expressed his satisfaction on the role of GARV in sensitizing the government institutions to timely achieve electrification targets.

The most valuable indicator is that the villages being covered have always remained in dark & even after 69 years of independence, people in these villages were forced to lead life of misery. Now after electrification in these villages, the impact of basic amenity "Electricity" on all the developmental aspects of life viz. standard of living, education, healthcare, agriculture, small scale industries &employment opportunities is becoming visible.

Dr. Dinesh Arora, *IAS, Executive Director, Rural Electrification Corporation Limited, email: arora.dinesh@ias.nic.in*

Mr. R. K. Gupta, *Additional General Manager, Rural Electrification Corporation Limited, email:rkgupta@recl.nic.in*

Manipur Public Service Commission (MPSC) Online
Department of Information Technology, Government of Manipur

P K Singh, Nambam Deben and Bankimchandra M.

PROJECT OVERVIEW

The implementation of Online System for State Civil Service Examination in Manipur has brought about a considerable change in the overall process in the conduct and process flow in conducting the large scale examinations, which happens to be one of the most competitive examinations in the state of Manipur. We are indeed proud to be one amongst the FIRST in the COUNTRY to implement the One Time Registration for Civil Service Job application. We also believe that we are the FIRST in the country to provide a Document and certificate repository for the aspiring candidates.

The changes has been dramatic and it is purely visible physically too. Long queues in hot sun or rain are not to be seen anymore; aspiring candidates from far off places like Tamenglong need not stay overnight in the hotel readying to stand in the queue the next day just to collect the application form from the office of the Manipur Public Service Commission. He/ she needs not come again and again to submit the application form and again to collect the admit card/ hall ticket. Also, at the back end i.e. the office of the MPSC, considerable changes have been brought about. No need of huge data entry jobs, thereby eliminating the mistakes in the data, no need to manage the cash, no need to worry about assigning roll number and exam centers manually. The changes has been quite dramatic in the overall process management of the MPSC office improving transparency and efficiency. Following are few of the achievements of MPSC Online:

- One amongst the FIRST in the country to implement OTR (One Time Registration)
- First in the state to implement online system in job application processing.
- Incorporation of all forms of technology
  - eligibility engine
  - e-mail and SMS authentication
  - QR Codes
  - Online payment and reconciliations
  - Online Help and Support system
  - Automated processing
- Record one time user registration of 26K plus on MPSC ONLINE
- A record web hits of 5.7 million in a span of three months.
- MPSC Online being accessed from 30 countries.
- Approximately Rupees 40 Lakhs online transactions in 4 month time through MPSC Online.
- SAVED paper by around 1.17 lakhs sheets of A4 sized paper thereby saving environment indirectly.

Difficulties and challenges faced:

- The scope of the Project changed four times after the application went LIVE. This was equivalent to doing four different projects/ software with different requirements.

- Extension of last date for submission of forms on a frequent basis: The last date of submission was extended to such an extent that it closed just two days prior to the exam date. This was a real challenge in terms of applicants making payments online and transactions were hard to be reconciled and also online generation of admit cards, attendance sheet and giving time to the candidates to download their admit cards.
- Payment gateway integration – As payment gateway was not available at the time of integration, PayU was used for the application.
- Hosting Servers – The application was hosted on three different servers and considerable amount was spent to get the infrastructure on lease. The same applies to mail server too. As simultaneous connection rose to around 90+, the requirement for a separate mail server resulted.

Even though MPSC Online is less than two years old, constant improvements have been rolled-out. Few of the improvement implemented in the last 12 months are as follows:

- To update the application so as to enable the main exams where more than one exams on different papers on different days for different candidates with facilities of online payments and automated admit cards and hall tickets.
- Examination Processing and in terms of online availability of marks for all the candidates.
- Toll free number / support and dedicated HELP system to provide technical as well as nontechnical support to the candidates with at least 2 Voice support, 3 mail and online support and two technical support.
- An integrated information exchange system that can be used on exam days though the development of COMMAND and CONTROL center.
- Integration of Learning Management System among various others.

RESULT INDICATORS

Key Performance
Services that are currently being delivered using ICT
MPSC Online provides both G2C and G2G services. Citizens can fill up examination forms online and get admit cards / hall tickets online, making it a G2C initiative. At the backend, the entire examination is handled online which improves the quality of the entire process, making it a G2G service as well.

Benefits obtained from these services by each category of stakeholders

Table: Benefits of ICT from a candidate's perspective:

Sl. No.	Before	Now
1	Travel from far and near, even spending overnight in the Hotel to stand in long queues to collect the Paper based Application form from the office of the MPSC	ZERO travel requirements. Application available from the cosy Home or from anywhere

Sl. No.	Before	Now
2	Go to bank to create Draft/ bankers Cheque, Wasting the whole day. And for those candidates in remote locations where there are no banking facility, they travel down	All payments are ONLINE. Pay it via Debit card, Credit Card, net banking etc. anytime anywhere
3	Made a mistake while filling up the form – no corrections allowed, so travel down again to collect a new form	Edit your details anytime
4	Get the photocopies of all the document, each candidate would submit a minimum of 10 pages	Upload soft copies resulting in saving paper
5	Travel down to the office of the MPSC again to submit the application form, standing in long queues	Submit anytime on one click. Not only that, the processing engine checks your eligibility whether you can apply or not
6	Wait for notifications and keep track in newspaper about the status of the examination and when the hall tickets are to be issued	Notifications are online. The system tells you the status of your application, from submitted to under process to eligible to download your admit card. This is fully automated and is intimated by SMS, by mail and through his own portal
7	Travel down to MPSC again and stand in queues to collect the Admit card/ hall ticket	Admit cards are available online

Table: Benefits of ICT from MPSC's perspective:

Sl. No.	Before	Now
1	Print application forms and assign dedicate staffs for issue of application forms	No printing of application form thereby reducing paper use and staff are available for other important jobs
2	Data entry of the applicants. Possibility of many mistakes in names, address and other details of the candidates	Mistakes are minimized as candidates themselves types it online and no more data entry operation on the part of the MPSC
3	Physical verification of the applicant information	It is minimized as the eligibility engine checks the candidates of their eligibility during the time of applying

Sl. No.	Before	Now
4	Randomize the application forms and assign the roll numbers and exam centers	This is fully automated. Roll numbers are randomized and assigned. Centers are assigned from the exam center Pool from the database and its assigned to the candidates according to the capacity of the exam centers
5	Manage cash and deposit in the bank	Payments are automatically collected in the MPSC account. Reports are also made available anytime
6	Prepare admit cards/ hall tickets for individual candidates by writing into it the Centre names, center codes and the exam centers	All process are automated and admit card are generated with the click of a Button
7	Prepare candidates attendance sheet for each room for every exam centers	This is automated and the attendance sheet are generated with details of the candidates along with the photograph and the signature of the candidate for each of the exam rooms for all the exam centers
8	Report generation was difficult	Reports are available as an when required based on various conditions such as district wise distribution, gender wise breakup, caste and category wise breakup, center wise allocation etc.

Year-wise wise transaction volumes for various services
The following data is for the year 2016:
- Number of Hits: 5.7 Million hits (5,784,959)
- Total amount transacted though online: 39.95 Lakhs (INR 39, 95,250/-)
- Total number of online user registered: 26,964
- Total number of candidates applied for MCSCCE: 11,779
- Total number of online queries answered: 42862
- Countries from which the site was accessed: 30

Implementation coverage
- MPSC Online is an online portal for the Manipur State Civil Services Examination. This application can be accessed by anyone who has an internet connection and a laptop/desktop/mobile phone. This application covers all eligible graduates (and above) of the State who are aspiring to appear for Manipur State Civil Services Examination. Since this is an online application, its spread would cover all the hills and valley region where internet is available. Online payment of fees was integrated into the application in the last few months.

- The integration of online fee payment into the application has been a key landmark. This feature has resulted in the application saving approximately INR 40 Lakhs in the year 2016. This has resulted in ease of making payment of the fees without the hassle of making bank drafts or visiting a bank. Accounting overhead for MPSC has been drastically reduced since the online payments gets deposited into the department's account.

Outcomes in terms of Efficiency, Improvements and integration
Time and cost efficiency improvements
The time and cost improvements are classified into two perspectives.
Benefits for MPSC:
- No need to print and assign staff for issuing applications as the application forms are available online
- No need for data entry as candidate information would be available through the application
- Physical verification of documents would be minimized as the application check for candidate eligibility via its eligibility engine
- Payments are automatically updated to MPSC's account thereby reducing overhead to manage cash/bank draft transactions
- Automated admit card generation remove the manual process required to create admit cards for each candidate
- Reports are much easier to generate since all the data is available online

Benefits for candidates appearing for the exam:
- No need to travel from far-way locations to stand in queue to get the application forms for the examination as a candidate can access the online application from anywhere
- No need to go to the bank to pay registration/examination fees as candidates can pay the fees online
- No need to get photocopies of documents as candidates can upload scanned copies of documents
- No need for the candidates to wait for notifications regarding the examination as the status of his/her application and admit cards are provided online

Specific innovative ideas implemented in e-Gov area and their impact on services
- One amongst the FIRST in the country to implement OTR (One Time Registration)
- First in the state to implement online system in job application processing.
- Incorporation of all forms of technology
  - eligibility engine
  - e-mail and SMS authentication
  - QR Codes
  - Online payment and reconciliations
  - Online Help and Support system
  - Automated processing

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems

From Candidates perspective, the following services are completely done electronically:

- Get application forms
- Submit application forms
- Pay examination fees
- Get admit cards/hall tickets
- Get examination schedules and topics to be covered
- Get latest news on schedule changes or anything exam related

From MPSC's perspective, the following services are completely done electronically:

- Dispersal and collection of examination forms
- Managing applicants information
- Collection of examination fees
- Report generation
- Assigning roll numbers and assigning of examination centers
- Preparation of candidate attendance sheets

ENABLER INDICATORS
Process reengineering

From Candidates perspective, the following e-services were planned:

- Get application forms
- Submit application forms
- Pay examination fees
- Get admit cards/hall tickets
- Get examination schedules and topics to be covered
- Get latest news on schedule changes or anything exam related

From MPSC's perspective, the following e- services were planned:

- Dispersal and collection of examination forms
- Managing applicants information
- Collection of examination fees
- Report generation
- Assigning roll numbers and assigning of examination centers
- Preparation of candidate attendance sheets

Challenges faced in implementing Process changes

- The scope of the Project changed four times after the application went LIVE. This was equivalent to doing four different projects/ software with different requirements.
- Extension of last date for submission of forms on a frequent basis: The last date of submission was extended to such an extent that it closed just two days prior to the exam date. This was a real challenge in terms of applicants making payments online and transactions were hard to be reconciled and also online generation of admit cards, attendance sheet and giving time to the candidates to download their admit cards.

- Payment gateway integration – As payment gateway was not available at the time of integration, PayU was used for the application.
- Hosting Servers – The application was hosted on three different servers and considerable amount was spent to get the infrastructure on lease. The same applies to mail server too. As simultaneous connection rose to around 90+, the requirement for a separate mail server resulted.

The Lessons learnt from the Process re-engineering exercise
- Requirement gathering should be done in detail to avoid reworks
- Involvement of all stakeholders is important to achieve the desired outcome

Best practices adopted from the industry/ other State implementations
- One amongst the FIRST in the country to implement OTR (One Time Registration)
- Use of email and SMS based authentication
- Use of an eligibility engine to remove ineligible candidates
- Use of online payment module for payment of fees

Leadership, Change Management, Capacity Building during transition
Project management & Monitoring
Project was supported by all departments concerned and adequate communication channels were opened between the vendor and the stakeholders for smooth implementation of the project. The following ensured effective change management and capacity building strategy:
- Leadership Support
- Training to MPSC officials
- Program management by SeMT (State e-Governance Mission Team)
- Regular review meetings for monitoring the progress of the project

Financial model adopted
Project was funded entirely by Department of Administrative Reforms & Public Grievances, Government of India

Special efforts to ensure sustainability of the e-Governance initiative(s)
Studies were carried out with all stakeholders and their inputs were analyzed and implemented on merit. The application has been sent for Security audit to a CERT empanelled agency and results are awaited.

Challenges faced in transition
The changing of specifications by MPSC midway during the project resulted in quite a lot of challenges. Other challenges emerged during the transition such as training needs of the department as per the implementation of the new model but adequate arrangements were provided later on.

The Lessons learnt from Change Management and Capacity building
FRS (Functional Requirement Specification) should be done diligently and scope should be frozen early.

Technology
Scaling up and Security consideration
This application is developed in .NET 4.0 frame work using Visual Studio as IDE in C# and ASP.NET. Microsoft SQL Server is the database used for this

requirement. Bootstrap and Ajax are used for the user interface and Crystal Reports is used for generating reports from the application. This application is based on a Service Oriented Architecture based design. Services are un-associated, loosely coupled units of functionality that are self-contained. Each service implements one action, such as submitting an online application for an account. With a SOA, services are defined protocols that describe how services pass and parse messages using description metadata. Such an implementation promotes adaptability and scalability in the long run. The application has been sent for security certification from a CERT empanelled firm.

The Lessons learnt from Technology choices and implementation strategy

The usage of licensed software for the development of this application may result in additional overhead in the maintenance period.

VALUE INDICATORS

A study was performed before the implementation and the following points were noted as being pain points which should be addressed with the implementation of MPSC Online:

- A candidate appearing for an examination is required to come to the concerned department office certain number of times.
- Cumbersome process of document management
- Document and certification verification is inefficient
- Dissemination of knowledge and information
- Huge amount of data entry required as the applications are received on hard copies

Digital Inclusion

- Examination notifications are usually published on most of the popular newspapers by respective departments for which examination are conducted by MPSC. The information is also distributed via news channels and local bodies indicating that further information would be available at the MPSC website, resulting in people visiting the online portal.
- Any issues due to language, demographic and cultural differences were eliminated by MPSC Online. Following points could be noted to this effect:
  - Eligible candidates are digitally literate
  - Online system bridges the distance barrier
  - English is the offered language in the application which is understood by all applicants

Green e-Governance

The implementation of MPSC Online has resulted in paperless form submission process resulting in saving at least 1.17 lakh sheets in 2016 alone, accounting the amount of paper saved via making the form submission process online.

Shri P K Singh, *Commissioner (IT), Department of Information Technology*

Shri Nambam Deben, *Additional Director (IT), Department of Information technology*

Shri Bankimchandra M, *Sr. Consultant PM, State eGovernance Mission Team, Manipur, bankimchandra.m@semt.gov.in*

Service and Payroll Administrative Repository for Kerala (SPARK)
Department of Finance, Kerala

K. M. Abraham and Girish Parakkat

PROJECT OVERVIEW

SPARK (Service and Payroll Administrative Repository of Kerala) is an e-governance endeavour under Finance department, Government of Kerala which is operational since 2007. The project functions as an Integrated Personnel, Payroll and Accounts information management system, for state government employees, AIS officers, AICTE /UGC and Judicial staff and part time employees. SPARK manages the service, salary, accounts, income Tax, HR claims and other HR related matters of all the state government establishments covering 39 Government Departments, over 122 Field Departments and over 30000 offices spread across the State, about 5 lakhs employees are currently being benefitted from this facility. Service books of all employees in state service have been digitalized through this software. The concept of SPARK emerged as a part of data digitization move in Government offices. The need for a centralized system for managing and processing the service/salary related matters of government employees, prodded the state Government to commission a new venture, SPARK (Service and Payroll Administrative Repository of Kerala). The project is under the direct control of Finance Department, Government of Kerala. SPARK software is now integrated with treasury and Accountant General Office, so there is no need of re-entering of salary bills generated from SPARK in Treasury offices and the AG Slips from Account General Office also gets updated after Accountant General Office integration. This web based Personnel, Payroll and Accounts information system is the mainstay of states Financial Disbursement System. Every state Government Employee is allotted with a unique Permanent Employee Number (PEN) through the system, this enables the users to operate and handle their SPARK account and resolve their service needs. The enticing factor about SPARK is that this is the one and only HR related data sharing application for all the other e governance initiatives of Kerala.

Before SPARK implementation, salary processing of government employees was done manually by each employee. In that case the employees had to deal with various procedural delays and complications. Most of the employees may be unaware about new increment, arrears, allowances etc., this may end up with erroneous salary processing. The SPARK system was developed and implemented based on the needs of government employees. The digitization of data and integration of necessary details in SPARK enables easy handling of service and salary matters to government employees. This system is designed in such a way that a uniform payroll and personnel administration can be applied to all employees under Government of Kerala. This centralized integrated computerized personnel and payroll information system will help the government to get details of any employee immediately, achieve highest level of transparency in dealing with the employees, more consistent application of rules etc. On the payroll side, accurate and automatic payroll processing is facilitated. It also ensures that the rules and regulations are uniformly applied to all employees thereby avoiding complaints and

thereby achieving better employee relations. Employees getting information on-line and through alerts will result in transparency and smart administration.

The SPARK system has provision to generate all the reports in PDF format. Yearly data growth in the SPARK Database has estimated as 3-4 crores. It also ensures that the rules and regulations are uniformly applied to all employees thereby avoiding complaints and thereby achieving better employee relations. Employees getting information on-line and through alerts will lead to transparency and trust in the system and the administration. SPARK system has implemented to effectively manage the state financial disbursement system. In addition to G2E applications, the significance of the SPARK system has now been extended to G2G and G2C levels. Digitisation of employee data in SPARK enables the decision makers in formulating various policies relating to human resource management in government Sector. The prime example of utilising SPARK data for decision making was seen during finalisation and approval of 2014 Pay Revision Order. The financial implication of PR 2014 was calculated based on the SPARK data. SPARK data's G2G level relevance also extends to areas like deciding HR hierarchies RTI queries and department specific details provided to individual departments.

RESULT INDICATORS

- HR related details of all the employees in State government service can be extracted from SPARK system
- Service book of all employees has been digitalized.
- Salary processing of all state government employees is presently only processed through SPARK.
- Government employees increment sanctioning is now done through SPARK system.
- The SPARK system also ensures the rules and regulations are uniformly applied to all employees thereby avoiding complaints and achieving better employee -employer relations.
- Online Transfer Processing of SPARK hastens the transfer procedures of employees.
- HR claims of employees are now activated through SPARK
- SPARK provides provision for filing annual property returns of Government officials including AIS Officers
- SPARK has modules for Income tax calculations and modules for filing Income Tax.
- All arrear calculations both Salary and DA Arrear are getting calculated through SPARK.

The centralized database developed in the SPARK system is robust in quick decision making and pursuant in applying rules and regulations uniformly for all employees. The important features of the SPARK include salary processing of gazetted, non-gazetted and all India service personals serving as state government employees, Increment Sanctioning, Leave salary and arrear bills preparation, Management of recoveries, advances, loans etc. of employees, Online Transfer processing, LPC Generation, Transfer Management module, Income tax

computation and generation of statutory forms etc. The SPARK system has provision to generate all the reports in PDF format. SPARK provides interface for individual employees to view their salary, loan, leave, GPF, accounts and personnel details, Provision for filing Annual Property Returns for Government Employees and All India Service officers. Benefits of the system includes easy and speedy pay bill preparation, automatic generation of Employee Identity card, automatic alerts and notifications when payments are credited and ensures transparency and smart administration.

Key Performance
G2E services:
G2E services are provided to all Government Employees of the State, AIS officers, AICTE /UGC and Judicial staffs. SPARK system manages the service, salary, accounts, income Tax, HR claims and other HR related matters of all the state government establishments covering 39 Government Departments, over 122 Field Departments and over 30000 offices spread across the State, about 5 lakhs employees are currently being benefitted from this facility.

- Salary Processing
- Increment Sanctioning
- Transfer Management
- Online working arrangements and deputation processing
- Online leave processing
- Leave sanctioning
- Regularization of employees
- LPC Generation
- Pay Revision processing
- Online Promotion Processing
- Online retirement processing
- Post sanctioning
- Leave salary and arrear bills preparation
- Management of recoveries, advances, loans etc of employees
- Provision to generate Identity Cards
- Interface for individual employees to view their salary, loan, leave, GPF, accounts and personnel details
- Provision for filing Annual Property Returns for Government Employees and All India Service(AIS) officers
- Income tax computation and generation of statutory forms etc

As per August 2016 SPARK data, about 12,000 temporary employees have been benefitted by this project for their salary and claim processing

G2G services:
Digitisation of employee data in SPARK is enabling decision makers in sanctioning new posts and formulating various policies relating to human resource management in Govt Sector. The prime example of utilising SPARK data for decision making was seen during finalisation and approval of 2014 Pay Revision Order. The

financial implication of PR 2014 was calculated based on the SPARK data. SPARK data's G2G level relevance also extends to areas like deciding HR hierarchies RTI queries and department specific details provided to individual departments.

SPARK is the one and only HR related data sharing application for all the other e governance initiatives of Kerala. SPARK system shares data to Accounts general office, treasury office, and also to ICT systems like Viswas (Kerala State Insurance Department), MVD (Motor Vehicles Department, Kerala) AMS, attendance management system, e-office etc.

It was observed that the usage of SPARK is progressively increasing from year by year. The year wise data, from 2005-2016 regarding the number of employees processing their salary through SPARK is shown below. SPARK year wise data (from 2005 to 2016) of Salary Processed Employees

Year	Employee Count	Year	Employee Count
2005	1889	2011	320753
2006	3852	2012	500174
2007	7004	2013	508998
2008	30094	2014	509660
2009	113417	2015	514344
2010	283853	2016	500395

Year-wise wise transaction volumes for various services

Table: Services and no. of bills in different year

Description	Count		
	2013-14	**2014-15**	**2015-16**
DB growth transaction	14GB	18GB	23GB
Allotted PEN	19608	22116	11385
Online Salary Processed	999560 Bills 4912973 Individual Bills	1181410 Bills 5821687 Individual Bills	641239 bills 3852795 Individual Bills
Online salary Arrears and DA Arrear processed	291 Bills 910 Individual Bills	6178 Bills 21761 Individual Bills	400139 Bills 2126185 Individual Bills
Online Bill Processed	1000359 Bills 4915703 Individual Bills	1188047 Bills 5837141 Individual Bills	1009898 Bills 5342767 Individual Bills
Online claim Processed	176 Bills 176 Individual Bills	3629 Bills 6124 Individual Bills	95381 Bills 200496 Individual Bills

Name of Service	Number of service during last year
Allotting Permanent Employee Numbers (PEN)	676912
Online salary Processing	6293042
Online salary Arrears and DA Arrear processing	5276261
Leave salary processed	348244
Bills of Claims Processed	213629

Implementation coverage

SPARK system manages the service, salary, accounts, income Tax, HR claims and other HR related matters of all the state government establishments covering 39 Government Departments, over 122 Field Departments and over 30000 offices spread across the State, about 5 lakhs employees are currently being benefitted from this facility. Yearly data growth in the SPARK Database has estimated over 3-4 Crores. According to the last years SPARK data, online salary transaction of nearly Rs. 192000 crores and online financial claims of employees Rs. 1900 crores have been processed through SPARK system. The estimated number SPARK logins in the past year has raised to about 8250000. Now, a new option has been incorporated in SPARK Software which enables the stakeholders to view their AG slips, Reference number of the slips and can identify whether the slips are validated or not. Temporary employee module has been recently implemented in SPARK system, in order to process the salary and claims of temporary employees working in Government sector.

Outcomes in terms of Efficiency, Improvements and integration

Service book of all state government employees have been digitized through SPARK. All the government procedures are now being processed through this software, this saves time and cost of traditional government procedures which are laborious as well as time consuming. Automatic generation of Employee Identity card is facilitated in this system. E-submission of salary bills is another important facility incorporated in this software. After salary processing, the bills can be submitted to the treasury online. When the bill is passed from treasury, it will be updated automatically in SPARK also. Most of the salary, Income Tax and GPF related details are now online. This will reduce the distance between head office and remote offices to a mouse click. SPARK system facilitates easy and speedy pay bill preparation. States administration will also be benefited since all the HR related service and salary activities of state government employees are carried out through the system. As service books of all government employees have been digitized through this system now it is easy for administrators to identify the dearth of HR in government system and based on the needs the government can decide on new post creation or any alternate arrangements. SPARK system also acts as a data source for government and policy makers to formulate new government policies and rules. The system also ensures transparency and smart administration.

Being a well-integrated system, the changes made through one module reflect in all related areas of activity. In the payroll side, accurate and automatic payroll

processing is facilitated. Digitisation of employee data in SPARK enables the decision makers in formulating various policies relating to human resource management in Govt Sector. Relevance of the system also extends to areas like deciding HR hierarchies RTI queries and department specific details provided to individual departments. The system offers highest level of transparency in dealing with the employees, the system ensures uniform application of rules and regulations to all thereby avoiding complaints and achieving better employee -employer relations.

The extent of integration
SPARK software is integrated with treasury and Accountant General Office, so there is no need of re-entering of salary bills generated from SPARK in Treasury offices and the AG Slips from Account General Office also gets updated after Accountant General Office integration. SPARK shares data to other ICT systems like Viswas, AMS- attendance management system, e-office etc. SPARK is the one and only HR related data sharing application for all the other e governance initiatives of Kerala.

ENABLER INDICATORS
Process reengineering
Before SPARK implementation, salary processing of government employees was done manually by each employee. At that time, the employees had to deal with various procedural delays and complications. Most of the employees may unaware about new increment, arrears, allowances etc, this may end up with erroneous salary processing. The SPARK system was developed and implemented based on the needs of Govt employees. The digitization of data and integration of necessary details in SPARK enables easy handling of service and salary matters to government employees. Government rules were issued for making all the HR related procedures and financial transactions through spark. SPARK system enables the users to settle the financial transactions through bank account/ TSB account. One DDO system recently implemented in SPARK authorizes a DDO to handle service and salary matters of all employees in the concerned office/ sub offices. This will reduce the time and effort of government employees. The major implementations are as follows
- Digitalization of Service of books of all Government employees- Service data of about 5 lakh employees have been entered in the software so far.
- Execution of all service and salary related matters of Government employees through the Software - Presently all service and salary related matters are processed through SPARK including Temporary employees.
- Integration of Data in financial transactions: Now SPARK has been integrated with Treasury and Accountant General Office, which facilitates smooth financial transactions.
- SPARK Token system for taking appointments in SPARK PMU helpdesks
- Feedback form- This enables the SPARK stakeholders to suggest changes/ improvements to be made in the software, also to register their complaints.
- Annual property returns Module – This module enable the employees to file their annual property returns through SPARK.

- NPS service module- New Pension scheme module has been incorporated in SPARK for the employees enrolled in government service on or after 01.04.2013

Challenges faced in implementing

- Connectivity (All the Departments/Offices are E connected through KSWAN which will ensure the reach).To accommodate all departments and offices under SPARK, internet connectivity with proper bandwidth was required in all offices. Most of the offices are in remote villages where provision to provide connectivity was very less. Government of Kerala has initiated a network, KSWAN, covering all offices together in a network.
- Training (The key officials needed to be trained in using the application). It was very difficult to make the employees starts using the software, several levels of capacity building programmes were arranged for the officials to make them comfortable in using the software.
- Data to be handled was very huge (service data of about 5 lakh employees have been entered so far).

The Lessons learnt from the Process re-engineering

It was identified that the type of services, the manner in which we provide services to our stakeholders and methodologies we followed to implement the project is very apropos.

Best practices adopted

We have developed our own strategies to implement the project, considering the need of our stakeholders and the nature of the services we can offer to the Stakeholders. New modules are being incorporated into the softwarebased on new government policies and also on the demands of the stakeholders. So far the project is running very successfully.

Leadership, Change Management, Capacity Building during transition

The experts who have been playing the leadership roles in SPARK are the main pillars of the system. Their excellent leadership, proper directions and timely interventions enables the smooth functioning of SPARK. They make necessary policy changes and recommends emendations/sanction of government rules to resolve the intricate issues arising in SPARK Implementation and to ensure all the service and salary transactions only through SPARK system.

Change management and Capacity building strategy

The officials in charge of DDO's (Drawing and Disbursement Officers) and the Department Management Users managing SPARK may get replaced by other official due to transfer/promotion/death/leave/superannuation. In such cases new officials taken in charge as DDO/DMOs are given enough training to manage SPARK effectively. Diligent and Efficient Master Trainers have been recruited in SPARK PMU of Trivandrum and Kannur to assist the stakeholders.

Project management & Monitoring adopted

SPARK has a dedicated Project Management Unit under the control of Joint Secretary, Finance Department as Chief Project Manager, Under Secretary, Finance

Department as Manager (SPARK), two System Administrators and twenty three Master Trainers.

An in-house software 'QUEST' has been developed by SPARK PMU to monitor the calls and the type of queries received at the HelpDesk. With the help of 'Quest', SPARK PMU can identify the frequent queries from employees and the associated SPARK modules, so necessary changes can be made in that modules based on users requirements. It also helps to record and quantify the number of queries answered by mail, chat and phone at the HelpDesk by each person.

Financial model adopted
SPARK project is funded by Finance department, Government of Kerala. This project is purely government funded project and is owned by Finance Department, Government of Kerala.

Special efforts to ensure sustainability of the e-Governance initiative[s]
Sustaining of the system was ensured by administrating all service and salary related matters, including financial transactions of state Government employees, only through SPARK system.

Challenges faced in transition
- Extend of ICT awareness of officials handling SPARK : Proper trainings are given to officials by identifying the extend of ICT awareness of the officials
- New government policies, rules and orders: Project Management Unit conduct continuous training to SPARK PMU Staffs to make them acquainted with new government policies, rules and orders.

The Lessons learnt from Change Management and Capacity building
SPARK trainings are the most inevitable and expedient aspects in Change management and Capacity building exercises.

Technology
In SPARK, processing of huge data transactions is being done by a batch system incorporated in the software. Being a well-integrated system, the changes made through one module reflect in all related areas of activity. In the payroll side, accurate and automatic payroll processing is facilitated. It also ensures that the rules and regulations are uniformly applied to all employees thereby avoiding complaints and achieving better employee -employer relations.

Compliance of the Technology
- Implemented SSL security technology to ensure confidentiality, authentication and security in data transactions and this security technology protects the transmission of data between stakeholders and government, account information and private data from unauthorized users.
- While creating user accounts, the user passwords are authenticated by sending an OTP followed by selecting a username & password. This ensures protection from replay attacks

- The SPARK servers are placed behind firewall at the State Data centre and are highly secured.
- Digital signature authentication has now been implemented in SPARK to protect the system from unauthorized access.

Strategy for Disaster
Backup Policy already implemented. Near DR site (Data backup) under preparation.

Impact and value-addition through adaption of Social media
SPARK being a compulsory system for processing the service and salary matters of all government employees, the relevance of social media in managing the system is nearly zilch.

Technology related challenges
During the initial stages of SPARK implementation, considering the huge data, the digitization was done offline, now data digitization of all service and salary matters has completed successfully.

VALUE INDICATORS
Digital Inclusion
- SPARK conducts training programs across the state for all the stake holders belonging to all the categories.
- One DDO system: According to 'One DDO system', the service/salary related matters of all employees in an office are managed and processed by a DDO ((Drawing and Disbursing Officer), the person in charge of DDO, will be a top most officer in the respective office and the person is well trained to use SPARK software. This person will be managing the official matters all employees in that office.
- SPARK PMU helpdesks across the state: Help desk has been arranged across the state in order to help the stakeholders covering all the categories.
- SPARK DMU in all government departments: Government officials well versed in Government rules and ICT have been recruited as SPARK DMUs (Department Management Users) in each of the government departments in order to support and serve the stakeholders of all the categories in the respective departments.

Green e-Governance
Reduced paper consumption – Service and salary related matters of all state government employees are now being processed electronically through SPARK software. By replacing the traditional paper works with SPARK, the system could effectively reduce the environmental pollution caused due to increased paper usage.
- Server consolidation executed in SPARK ensures less power consumption and minimum usage of energy as the system uses only fewer servers.
- SPARK provides facilities like online chat, email and Tele communication options to the stakeholders to communicate with SPARK PMU, this reduces the carbon emission from travel, the stakeholders can work

- A unified IP messenger is used for in-house data exchanges in SPARK PMU, this reduces the paper usage and saves energy.
- The system ensures energy-efficient use of equipments in Data Centers and Helpdesk units.

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Skill Young India Portal for Skilling Sikkim & North East
Department of Skill Development and Entrepreneurship, Govt. of Sikkim

Jaya Kumar and Mrinalini Shrivastava

PROJECT OVERVIEW

Skill Young India can be characterized as a cloud based autonomous online transactional systems designed & deployed to enable convergence and collaboration across departments, state agencies, training partners, industry establishments and skill aspirants. Stakeholder centric online processes enable the involvement and participation of various collaborating partners and the skill mission teams in the States update, maintain and manage real time data relating to implementation of skill initiatives – view & update profiles of industry and training partners offering opportunities for skilling and placement, seek and update information on admissions and enrolment in courses, training progression, payment of scholarship, placement in industrial establishments, information on man-power demands, job profile in industries, counselling sessions with skill aspirants, with the purpose of enabling skill aspirants make wise choices on their career and life choices, maintain and update their resume' s, remain updated with information available in the events section, photo gallery, policy notifications, notices, blogs and online helpdesks.

The Portal serves as a System and Mechanism for the Skill Mission Teams to implement a convergent, coherent plan of action, with clarity in terms of ownership, outcomes and deliverables to accomplish results in terms of (a) creation of opportunities for self employment and industrial/community based employment, (b) tangible enhancement of skill levels and core competence, and (c) for nurturing a vibrant ecosystem for workforce development, grooming skill aspirants

with innovative approaches following progressive paradigms like project based learning, lifelong learning, online digital self-learning, assessment and certification, recognition of prior learning etc. These efforts are again to be visible transparently, on the skill young India portal employing a professional evidence based approach with dashboards and drill down views.
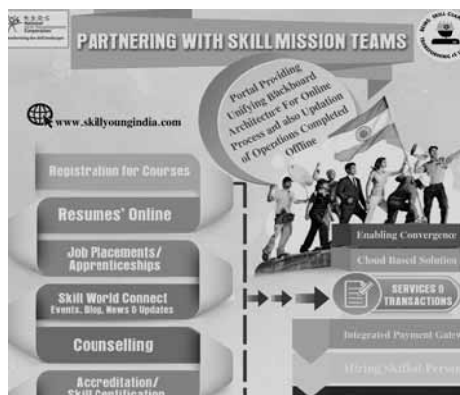
The application is Geo Information sensitive and detects locations of users to provide user centric data with a provision for manual override to specify other states or nationwide data. In the context of field operations for implementing skill initiatives, there are multiple modes of engagement, advocacy, skill training delivery, assessment and certification, recognition of prior learning, industry engagement and involvement of training partners. The portal system expands, adapts and embraces such complexities with iterative redesigns; as it evolves on the scalable Amazon Web Services Cloud infrastructure to provide reliable, manageable, secure services; expanding on compute resources, commensurate with the nature and intensity of engagement and the characterisation of operations that are carried out. Skill Mission

Teams have been constituted and notified including key nodal officers from various state departments/ agencies, as also the professionals who are trained to manage content and familiarize themselves with the operations of the skill young India portal, in keeping with the field operations, activities and outcomes.

Accreditation of Courses/ monitoring quality of training and assessment of skills and competences are rigorously pursued to ensure compliance with standards prescribed by the notified Skill Training Authority and State Council for Vocational Training of the State. Payment Gateway has been integrated to facilitate payment of fees/ charges for premium services as also for annual registration / renewal for different categories of users. All events, career-mela, workshops, training and workshops for engagement, capacity building, promotion and advocacy to encourage rigor in operations, updation of data real time in the portal for transparency and enforcing compliance and accountability though a combination of policies, practices, interactions and field operations are strategies which have been employed to promote use of the skill young India portal.

RESULT INDICATORS
Key Performance
The portal skill young India and associated India skill pedia has been observed to enhance convergence, integration across state agencies, training providers, skill aspirants, industries in operations to promote, engage, liaison and implement various skill development initiatives with active support from (a) Central Government Ministries, (b) State Departments, (c) Industry partners contributing through CSR, as also in availing technical assistance and Industrial work placements under various provisions of MOUs/agreements drawn up, (d) Leveraging bilateral and multilateral funding and technical assistance, (e) In implementing schemes like rural livelihood programme, DDU, State level programme, Pradhan Mantri Kaushal Vikas Yojna, Labour Cess for skill development, Rural/Urban employment & livelihood programmes, and (f) To source funds for implementation and establish Corpus for sustaining programmes and ensuring support in the form of stipends, scholarship and incentives for skill training, entrepreneurship and Industry work placement.

Facilitation and Service Delivery Centres have been set up where the portal services are facilitated by trained counsellors for engagement of youth, dissemination of information, creation of awareness and interest and enabling them to apply for training in various courses, internships and apprenticeships through online transactions or through offline updations using management of operations features/ links. The System – India skillpedia associated with skillyoungindia.com portal envisages training support by providing online wide-ranging learning resources – knowledge compendiums, references, practice guides, handbooks, etc., accessible under various topics and themes. The enriched contents serving as an online knowledge repository, promotes lifelong & flexible learning – on campus, off campus, in workplaces, distance learning, online learning etc. Flexible learning pathways keep the learner needs as central and extensive support to accelerate learning is being offered in the India skillpedia portal in partnership with content providers, authors, resource persons, institutions and government agencies. All

Skilled persons data base with their profiles- resume etc. are available in real time, online for use and access by the concerned person or industries/ establishments seeking to offer them opportunities for apprenticeships and placements. Aadhar number and Bank account of trainees or their guardians in case of minors are maintained in the data and are being used for transfer of scholarships and stipends through the payment gateway /direct bank transfer.

Implementation coverage

Extensive training and engagement is underway to popularize and enable various user groups use of features and capabilities which have been developed and deployed for online services – relating to applications, processing, decision, notifications, updations etc concerning (i) registration/ renewal, (ii) course admission, (iii) placement, (iv) counseling, (v) industry manpower demands, (vi) skill certification, (vii) scholarship (viii) learning resources (ix) mentors / resource persons database (x) profiles of training providers, industry sectors and jobs as also associated areas in the knowledge repository India skillpedia portal concerning (a) learning resources (b) skill merchandize (c) IP Advisory and consultancy (d) technology, tools and work-environment (e) design and manufacturing (f) entrepreneurship and startup guidance etc.

Workshops have been organized for skill mission teams which have designated/ nominated persons from State Departments/ Agencies implementing skill initiatives, to take ownership and responsibility for content updation. A three level simple validation and authentication process enables scrutiny and validation of content uploaded by industries, training providers and other content authors, prior to placement in the public domain. Field operations, counseling, advocacy, career fairs/job mela and skill festivals and workshops are now aggressively pursued to enhance use of portal. Letters have been written to all StateHeads of Departments.

In addition to online enabled transaction services, Offline upload of data relating to transactions completed (offline) has been provided under "Management of Operations" Panel to enable skill mission teams upload relevant data for enhanced visibility and transparency as also for reference by all stakeholders. User Manuals and Updates such as the one whose cover page is given below are shared with all categories of users to familiarize them with the processes, solution architecture, functionality and features of the portal. The portal features are already being extensively harnessed by the constituted skill mission team and state agencies/ institutions in Sikkim. Communications have already been sent to other NE States and workshops to train skill mission teams in other NE States are being planned in the near future.

Outcomes in terms of Efficiency, Improvements and integration

The Portal skill young India serves as a System and Mechanism for the Skill Mission Teams to implement a convergent, coherent plan of action, with clarity in terms of ownership, outcomes and deliverables to accomplish results that are evidence based, with cross referenced processes and corroborating facts, transparently presented in the portal. Drill down features, menu links are presented intuitively to ensure accountability in terms of:

- Creation of opportunities for self employment and industrial/community based employment.
- Tangible enhancement of skill levels and core competence, and
- Ushering in and nurturing a vibrant ecosystem for workforce development, grooming with innovative approaches following progressive paradigms like project based learning, lifelong learning, online digital self-learning, assessment and certification, recognition of prior learning etc.

These efforts and corresponding outcomes are again visible transparently, with the portal solution structured and designed on the basis of a professional evidence based approach. The portal will bring together stakeholders and experts from various fields to support Learner acquire knowledge and skills to meet Industrial Standards. It serves as a real time and online information and decision support with drill down views capturing the progression end to end -from the trainees making choices; to their successful placement in industries or establishing start-ups, business units or pursuing self-employment avenues. The portal implements automated processes and serves as a platform for collaboration to connect, to engage and involve stakeholders in the processes they require to participate in, to accomplish the envisaged outcomes. The portal links experts from various fields to support learners acquire competence and meet industrial standards. The portal brings together:

- *Government*- for offering scholarship programmes and incentives
- *Industries*- for vocational training support
- *Training Organizations* - to groom trainees
- *Facilitation Centres*- for training support and counseling
- *Aspirants*- availing opportunities for skill development, training &apprenticeship
- *Job Seekers*- pursuing and harnessingJob opportunities and self-employment

The enrolment of trainees under various courses – with the profile of courses, names of students registered under each course, and their profile is clearly visible in the portal home page, f*or example–*

- Training Sectors 23; Training Courses 85; Training Providers 29;Registered Trainees 1493; Scholarship Disbursement 320; Placements 614 with further drill down and corroborated information.
- Information is maintained online in real time and is available for evidence based reporting / record keeping. Candidates can maintain and update their profile, which can be viewed by industries to shortlist persons whose profile meet their requirements. Industries would be able to post their manpower requirements in advance to enable job seekers prepare themselves to harness such employment opportunities.

- Disbursement of Scholarships, incentives and stipends are made online with the integrated online payment gateway.

ENABLER INDICATORS
Process reengineering

Challenges faced in instituting a re-designed of system to usher in a performance based evidence driven system to support skill training and employment involves complexity in terms of the need to engage multiple stakeholders – ranging from training providers, industries, skill aspirants, mentors, resource persons/ trainers to state agencies, institutions and infrastructure/ resource providers. Duplication of efforts by State Departments may result in sub-optimal use of deployed resources and outcomes. Lack of information sharing, coordination, integration, coherence and inefficiency in the use of resources; often results on account of the lack of convergence of efforts in the planning and implementation of skill initiatives. Diffused focus for engagement of young persons and aspirants for skill training, *adhoc* approaches for counselling, mobilization of candidates for training, very limited sharing of information across state departments implementing skill training in their respective domains are other major issues. Efforts to engage and partner with industries for apprenticeship, creation of job opportunities with appropriate MOU or collaboration agreements are usually attempted by more than one State Department without effective coordination.

The approach to realize convergence through a cloud based decision support, information dissemination and collaboration platform in the form of the skillyoungindia.com and associated indiaskillpedia.com portal has brought about a transformative change - with the implementation of portal based operations for information sharing, collaboration, process automation, delivery of services and decision support. The underlying strategy and approachas detailed hereunder, has brought about several significant results:

- The design of a systems and cloud based solution served as a black board architecture, an evidence based decision support system and an automated service delivery mechanism with an additional option to post and update information relating to field operations and processes which were completed in an offline mode in rural locations.
- Implementation of online processes led to better information sharing, notification on status updations, events, decisions and outcomes with the relevant communications taking place real time through email/ sms.
- Improved collaboration, better transparency and accountability was realized, with the portal solution offering a platform to transact, update and perform roles adapted to align with the responsibilities entrusted to different categories of stakeholders likes industrial establishments, skill aspirants, training providers and state agencies.

The design of process automation involved user friendly forms with online help, need to know information, tool tips, customized menu with appropriate control features to facilitate date entry, validation, authentication, integrity and security of data. All data updations take place through the processes designed for updation of

relevant databases with inbuilt validation checks. User contexts were created with well defined use cases, process flows, alternative options, and drill down views with relevant cross-references for corroboration and enabled comprehensive understanding of context within which actions were performed and information entries relating to field operations updated.

Configuration features enabled roles to be customized for the designated persons/ agencies participating in processes to perform transactions, update information and take decisions relating to enrolment of aspiring skill trainees, training progression, placement, counselling, accreditation of training providers, events etc. The portal has functionality, features and provisions for:

- Submission of applications by trainees for various courses offered by training organisations and for apprentice training offered by Industries.
- Processing of such applications by concerned departmental Officers who will be given access rights (after coordinating offline with concerned training organisation, establishment or industry).
- Updation of progression in training and offering scholarship, incentives through payment gateways directly to trainee account.
- Notifying events for advocacy, awareness, career fares or recognition/awards.
- Notifying industry manpower requirements.
- Enabling establishments to shortlist profiles of trainees from database to offer them internship, apprenticeships or jobs as maybe appropriate.
- Knowledge repository (deployed separately and linked with URL)with learning resources for self Learning, Online courses, lesson plans, schedules, do it yourself tasks, learn by doing projects for practical application, skill practice.
- Functionality to upload, display, modify, add or delete details of Resume' of the Trainees. In short, the portal serves as a single web based platform for all online electronic processes to promote and implement skill training by the respective state Departments.

There are also other advanced features such as provision for seeking course accreditation, viewing industrial man power requirements, viewing the profile of trained man power in the State, events, policies and notification, as also links for registration of work and processing the assessment of prior learning on the basis of experience, certification of skill levels etc.

Leadership, Change Management, Capacity Building during transition
A separate autonomous society, has been set up and registered as DESCONTAG stands for a Group that – "Engages in Design of Systems, focusing on Convergence, Transactions for Service Delivery, Analytics and Technology Applications", to provide system support and assistance in the management of operations and activities relating to portal operations and to handhold with members of the skill mission teams who take ownership for the content updation, for performing various online operations or updating of information for field operations completed offline. DESCONTAG Comprises of members who are Officer & Staff of Government

departments providing voluntary services, members of skill mission teams, as also professionals and knowledge engineers.
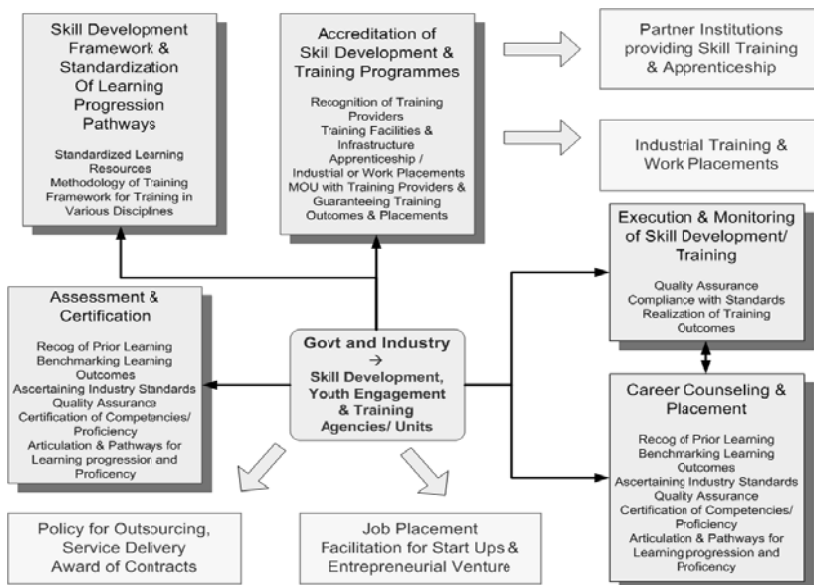
Figure: Capacity Building modal of State Institute

In Sikkim, a State Institute of Capacity Building, an institution functioning since 2009 which implements skill training programmes of the State has been actively involved in supporting the change to adopt evidence based approaches in managing and monitoring skill initiatives in the State. Other NE States are also being encouraged to institute appropriate mechanisms to handhold with DESCONTAG and the respective State Department overseeing Skill Development and Entrepreneurship.

Technology

The Portal has been deployed in Amazon Web Services Cloud infrastructure and is accessible on the internet on any smart phone or desktop systems. Open Source Code has been used with the applications designed and developed in Ubuntu environment using java and My SQL open source. The portal and its contents/databases are secured in Amazon Cloud Services. Backup servers with failsafe provisions, mirroring and disaster recovery have also been implemented with a backup control centre being maintained at Noida and at Gangtok Sikkim.Skillyoungindia.com is also being promoted through social media with facebook, twitter and linkedin accounts.

VALUE INDICATORS

Digital Inclusion

Technology is an equalizer and provides opportunities to inclusively deal with all categories of skill aspirants; - ranging across young persons, women, differently abled, tribal, disadvantaged, rural communities and vulnerable sections of the society. The site has bilingual contents both English and Hindi. In order to further enhance

inclusiveness, access is being provided through kiosks and facilitation centres, in areas where internet connectivity and WiFi cannot be deployed. Additionally, extensive provisions have been made to ensure SMS communications, in addition to email and web based status updates are provided, to enable skill aspirants track their admission to courses, progression in training, access and download learning references & resources and pursue employment opportunities for industrial wage employment or self employment.

Green e-Governance

Sikkim is an environment friendly state with green & clean processes having been adopted in all community initiatives. Fewer papers are used, plastics are banned, and the entire state is organic adopting vermin composing and recycling methods extensively. The State IT Dept. has introduced an e-Waste initiative to optimize use of electronic gadgets and implement measures for the safe disposal of waste after recovery of recyclable materials.

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SUGAM: An e-Governance Solution for Central Drugs Standards Control Organization
Ministry of Health and Family Welfare, Government of India

K. B. Agarwal, Ranga Chandrasekhar, V. K. Sharma and Paras Nath Barwal

PROJECT OVERVIEW

Pharmaceutical Industry is having tremendous growth in India. Central Drug Standard control organization is the National Drug Regulatory Authority under the Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India and is responsible for laying down the standards and ensuring safety, efficacy and quality for Drugs, Approval for Clinical Trials. Implementation of E-governance at CDSCO through SUGAM portal has brought simplicity, transparency, reliability, accountability, timeliness and ease of business. It is the project of national importance that directly affects the human life and is a major influence in bringing reforms in the Indian Pharma Industry. SUGAM enables online submission of applications requesting for permissions related to drugs, clinical trials, ethics committee, medical devices, vaccines and cosmetics. The system also builds up the database of approved drugs, manufacturers & formulations, retailers & wholesalers in India. The project also enables the complete digitization of the old CDSCO records having primarily application within the File, noting in Green sheet, and supporting documents uploaded. This has enabled the provision for full text & metadata search on the scanned documents retrieval of information across multiple files for a single entity or drug type. The portal also consolidates & publishes the data about the various licenses being issued by various states Food & Drug administration offices in the country. The prime objectives of the project are:

- To establish a single window for multiple stakeholders involved in the processes of CDSCO.
- To consolidate the Indian Drug Regulatory Framework by streamlining the CDSCO processes.
- To enable paperless grant of clearances by CDSCO.
- To enable higher level of transparency in Drug regulatory processes.
- To enable ease of business for Pharmaceutical Industry & regulatory agency.
- To enable the greater outreach of citizen centric & consumer centric information related to quality and standard of drugs in the country.

Benefits of the System

SUGAM portal provides the single window for all its stakeholders to access the services provided by the portal by implementing role based access control and actions. It has consolidated the entire Drug Regulatory framework at centre and provides a centralized dashboard for the monitoring the various regulatory clearances all over the country. SUGAM portal provides high level of transparency to its stakeholders as status of the submitted applications can be tracked from applicant dashboard. As well as, the portal is well integrated with the e-Nivesh that is the National portal to provide the project proponent/entrepreneur with all requisite information under one umbrella, which will reduce delays in various regulatory processes. SUGAM enables ease of business by providing the integrated

workflow right from making an application for grant of permission/ license, online payment, online review process, query management and grant of permission/license online. SUGAM portal internally builds the database of Drugs & manufacturers and their current regulatory status (approved/ banned) in India.

RESULT INDICATORS
Outcome and key achievements of the project:
- SUGAM was rolled out at PAN India level in Nov 2015.
- Today, the numbers of portal hits have reached 1.25Lakhs+.
- On an average, the number of users logged into the system during peak hours is 800+.
- Currently, all applications pertaining to following processes are submitted & processed online :
  - Import of Drugs for personal use
  - Import of Drugs for test & analysis
  - Import & registration of Drugs
  - Import of Medical Devices& Diagnostics
  - Registration of Cosmetics for Import.
- There is drastic drop(Approx. 65%) in timelines of processing of applications by regulatory authorities since the application is launched.
- Currently, data of approximately 1.25 Lakhs records, about the licenses granted by state FDAs records have been published on SUGAM portal.
- Recently, the online processes for export have been launched and shortly online process for Clinical Trials will be launched.
- Also, the Digitization of the old record & files are in brisk progress with approximately 9.5 Lakhs of pages scanned and recorded in SUGAM database.

Major Accomplishments of the project:
- SUGAM is the first government service to do integration with bharatkosh payment gateway with inbuilt RBI Integration for real time dollar-rupee conversion.
- Reduction in application processing time by 60-70%.
- Drastically reduced the query response time by 70-80% in most of the cases
- Building the comprehensive legacy data through applicants with subsequent verification process by CDSCO officials. As CDSCO was not having any data in soft copy that could be directly ported into the system, this exclusive activity need to be done.
- Status of Applications being monitored by National portal (e-Nivesh Monitor) by PMG, Cabinet Secretariat.

Key Performance
- **G2C (CDSCO to Citizens, Research Scholars):**
  a. Import of Drugs for personal use: These services are being used by Citizens of India for importing the lifesaving drugs that are unavailable in the country. These permissions are mostly issued to patients within no time(on the same day)

    b. Import of Drugs for test &analysis: These services are being used by R&D labs to conduct tests on Drugs that are imported.

- **G2G(Among various departments of CDSCO-ports, zones, labs):** SUGAM portal facilitates the e-communication among the various offices of CDSCO. The permissions that are issued are headquarters or zonal offices are immediately available to the port offices for receiving and verifying the consignments.

- **G2B(CDSCO to Pharmaceutical & Cosmetics Industry):** These services are provided to the Pharmaceutical Industry across the country wherein the applicant requests for grant of permission for import of Drug raw material that is used for manufacturing of drugs in the country or finished products that are marketed for usage in the country. This has enabled ease of business vision of Digital India for the industry.

- **G2E (CDSCO to its employees):** SUGAM also brings the complete e-Governance in the general administrative processes of CDSCO by implementing personal information system, budget information system, file tracking system, library management system at various locations of CDSCO.

Table: Year-wise wise transaction volumes for various services

Sl. No	Service	Period	Transactions
1.	Personal License	Nov2015-Sept2016	664
2.	Test License	May2016-Sept2016	3906
3.	RC of Drugs	Nov2015-Sept2016	470
4.	Import License of Drugs	Nov2015-Sept2016	1324
5.	RC for Medical Devices & Diagnostics	Mar2016-Sept2016	376
6.	Import License of Medical Devices	Mar2016-Sept2016	571
7.	RC for Cosmetics	June2015-Sept2016	74

Implementation coverage

SUGAM portal has been developed to enable complete e-governance for Indian Drug Regulator Central Drugs Standards Control Organization (CDSCO). CDSCO is the Central Drug Authority for discharging functions assigned to the Central Government under the Drugs and Cosmetics Act. SUGAM is used by multiple stakeholders across the country including the following delivery centers of CDSCO - 6 zonal offices covering all states of India, four sub-zonal offices within a zone, 13 port offices including all airports & seaports of India and 7 laboratories under its control. SUGAM portal enables online processes with respect to application and grant of permissions/licenses/NOC by any of the CDSCO locations across the country. It also enables the internal administrative processes of CDSCO like personal information system, budget information system, stores management system, library management system & file tracking system that in under

implementation on all the CDSCO locations. Details of Delivery Centers: SUGAM services have total 34 CDSCO delivery centers that cover all states of India (01 CDSCO Headquarters, 07 ZONAL offices, 06 SUB ZONAL, 13 Port offices 07 Laboratories). Following services of SUGAM have been implemented across the Country:

- Implementation of the citizen centric processes pertaining to the need of Life saving drugs to be imported from other countries
- Implementation of processes at Headquarters including Imports of Drugs, Devices, Cosmetics for all purposes.
- Implementation of the processes import of drugs for Research & Development in India.
- Publishing the data pertaining to the approvals granted by CDSCO on the portal
- Digitization of the old files and documents and make it searchable
- Interfacing with State food & Drug administration department to publish data pertaining the permissions issued by them on Central licensing authority dashboards.

SUGAM Services in the pipeline

- SUGAM Online services for grant of NOC Clinical Trials and monitoring of CT: SUGAM services for grant of NOC for conduction of clinical trials in India will enable online submission of various information on clinical trials to streamline the process of approval, maintaining comprehensive database and monitoring of clinical trials for ensuring the protection of rights, safety and well beings of trial subjects and authenticity of the data generated each clinical trial conducted in India will be identified by a Unique Identification Number (UIN) that would help CDSCO to keep track of all information in the system using this UIN. This will also build up the complete data about the patients enrolled in a clinical trial, the Investigator or the site, details of Serious Adverse Events (SAEs), if any, observed while the subject is on the trial and the outcome of the SAEs. In case clinical trial related SAEs, the details of the compensation paid/ claimed will also be captured.
- SUGAM Online services for NOC to manufacture/import New Drugs and fixed dose combinations: This will not only streamline the process of grant of NOC but also will build the comprehensive database for New Drugs approved in the country by a particular manufacturer.

Outcomes in terms of Efficiency, Improvements and integration

- Reduced Timelines for Application Processing: SUGAM workflow has been designed in such a way that it streamlines the process of application review. Below figure depicts the time efficiency improvements in delivering of services by CDSCO with reduced timelines by use of the system.
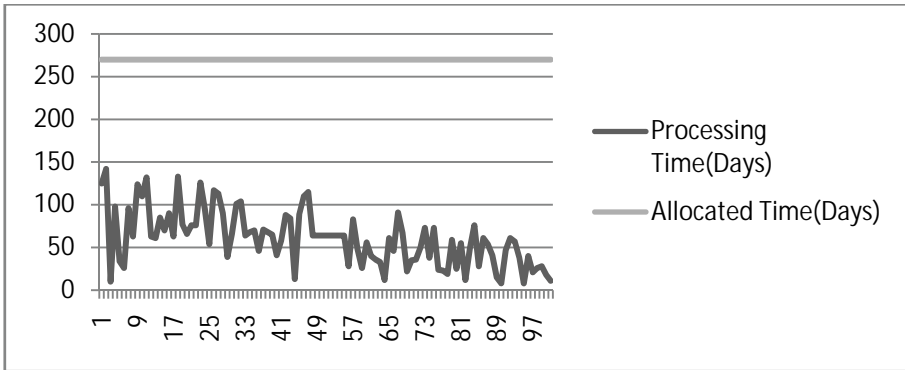
Figure: Delivering of services by CDSCO

- Use of e-Communications technologies for communication between various stakeholders through emails, SMS, online notifications has drastically reduced the effort of preparing letters/permissions and also reduced the costs of paper and manpower.

Specific innovative ideas implemented in e-Gov area and their impact on services.

- *Use of Data Analytics*: SUGAM portal has built comprehensive database containing the detailed information about the various drugs imported or manufactured in India with the details of the manufacturers within and outside India. Analytics on such data enables SUGAM to depicting the Dependency of India on other countries for supporting the health system. E.g.: The below chart depicts number of import permissions issued to applicants for importing drugs from other countries and it shows the high dependency of India on China.
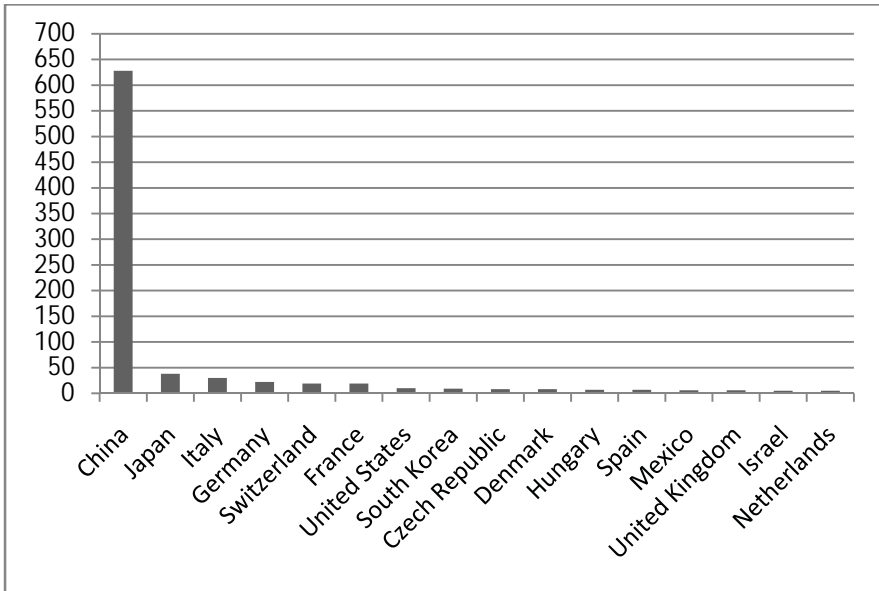
Figure: Dependency of India for importing drugs

Integration of SUGAM with other internal and/or external ICT systems:
SUGAM portal has been seamlessly integrated with other external government services by implementing **Web services** using extensible markup language (XML).Through its Service-Oriented Architecture it is able to communicate with following external services:

- *Bharatkosh:* Bharatkosh is the initiative of O/o Controller General of Accounts, Ministry of Finance, Government of India to provide one stop services to deposit any fees/fine/other money into the Government Account. SUGAM uses Bharatkosh for making online payments to Government of India wherein it contacts RBI services for getting Current USD rate. This communication with Bharatkosh is enabled through SUGAM's web services securely, in form of digitally signed XML documents.

- *National Mobile Seva:* Mobile Seva is an innovative initiative aimed at mainstreaming mobile governance in the country. It provides an integrated whole-of-government platform for all Government departments and agencies in the country for delivery of public services to citizens and businesses over mobile devices. SUGAM is using the web services of mobileseva to send SMS to the end users.

- *e-Nivesh*: e-Nivesh Monitor(maintained by Project Management Group, Cabinate Secretariat) is a single window system for monitoring clearances required for setting up business/projects in India for enabling fast and efficient Government-to-Business (G2B) services. The interfacing of SUGAM with e-Nivesh has been done using SOAP based web services that publish the required data from SUGAM to e-Nivesh national portal.

- *XLNIndia:* XLN India is software for online disposal of various Licensing applications in various state food & drug administration departments. SUGAM interfaces with xln india by taking its data and publishing it to the concerned officials of CDSCO for monitoring purpose.

ENABLER INDICATORS
Stakeholder's inclusiveness and participation
Right from the beginning of the project various stakeholders were involved during requirement gathering, design approvals, testing and final user acceptance. There have been regressive interactions with the CDSCO officials while developing the online process. Also, multiple demonstrations were given to stakeholders where in there feedback was collected.

Business Process Re-engineering: Some of the processes have been re-engineered for streamlining the processes at CDSCO

- Removal of manual prescreening of applications by building a system with inbuilt prescreening while application submission.
- In few cases of amendments to any permission, an applicant need to apply to individual division of CDSCO for the same thing, however with the business process engineering such cases now will be handled by the centralized authority and subsequently will be informed to all divisions about the approved amendment.

- Easy auto generation of Legal application form, note sheet at each level of official and legal permissions &licenses.

Change Management

A streamlined approach for managing the change request is followed that has enabled enhancement of the portal in timely manner and fulfillment of the requirements of the stakeholders. Any change that is reported is first analyzed to be as major or minor. Any minor change that is approved by CDSCO is completed within 1-2days and any major change depending upon its complexity is completed accordingly in10-15 days.

Technology

Following Technologies are used for the implementation of SUGAM Portal

- Architecture: 3-tier
- Platform: CentOS 6.2
- Application Server: Tomcat 7
- Database: Postgresql Enterprise DB 9.2
- IDE: Eclipse Indigo
- Technologies: JDK 1.7/ J2EE/JSP/AJAX/ JAXB 2.2.4, JqueryV(1.10), JSON , AJAX
- Frameworks: Spring 3.1.2, Hibernate 4.2.0, Bootstrap CSS framework V3.3.1, Angular JS Framework V1.4.4
- Software: swftools, flexpaper

Compliance of the Technology adopted with e-Government standards

Following are the Security measures that have been considered for enabling User Privacy & Security:

- *Secure channel transmission with https:* Transmission through SUGAM portal is done through secure channel using HTTPS.
- *Password Encryption:* The passwords of all the users in SUGAM are encrypted.
- *Role based Access:* Role based access for the authenticated users of SUGAM has been implemented to take care user privacy & access control. The access to user dashboards, menu options, actions and most important Data are available to the user only based on his role in the SUGM portal.
- *Digitally signed:* XML document is being used for sending data to third party services for the purpose of online payments.
- *Digitally Signed legal permissions/licenses:* that are uploaded in the system are digitally signed so that there is no possibility of tampering the same. The system checks if an authorized signatory digitally signs the uploaded document.

Following Security points have been addressed for Application Security:

- *Authentication Bypass / Forceful Browsing*: User will be redirected to very first home page of site, if no authentication found.
- *SQL injection (Blind SQL & Time Based) / Database Server Error* Message: This will safeguard SUGAM database.

- *Stored Cross Site Scripting / Reflective Cross Site Scripting / HTML* Injection: This will enable authentication of all web pages.
- *Cross-Site Request Forgery*: This will safeguard User from being redirected to any hackers site/pages.
- *Session Fixation*: This will allow one session per user.
- *Unrestricted File Upload*: This will allow only authenticated document is communicated with the server.
- *Sensitive Information Leakage*: To secure the application, encoded/decode information are always being passed on the site. This will ensure Personal Data Safety
- *Session ID Name Fingerprinting*: SUGAM portal has addressed by hiding the session details from Hackers/attackers
- *Server side Validation*: This will stop un-necessary or malicious data being carried to server

Strategy for Disaster Recovery and service continuity
SUGAM portal is being hosted at CDAC Noida data center. The Backup & disaster policy for SUGAM portal is in place at CDAC Noida datacenter. Daily incremental backup and weekly complete backup of the complete data & database is being taken from file server as well as database server. The data is kept synchronised with the CDAC Hyderabad data center to handle emergency in case of disaster.

Use of Social Media
Video tutorials about the usage of the system have been placed in YouTube for better understanding of the system & guideline to use the system.

Technology related challenges
Use of flash player used for opening multiple PDF files in browser caused capturing of entire server resource that led to slowness of the application. On identification of this problem, the usage of flash files was stopped & PDF files were directly being opened in PDF reader.

The Lessons learnt from Technology choices and implementation strategy
The documents that are uploaded through SUGAM portal are currently stored in a file server and will be moved to the archival system after the defined period of time. However, in the long run there is a need to implement the technology for Digital preservation of these documents so that they are preserved forever and will become a precious asset for the country

VALUE INDICATORS
Digital Inclusion
SUGAM portal has been developed based on Digital Inclusion approach in various directions. The portal has informative homepage providing information about various drugs/devices approved in India with information about the indications & prescribing information. It also has informative dashboards for various stakeholders indicating their recent activity, applications filled by them, files processed by them. It also displays the alerts & notifications. The portal enables e-communication with email & SMS support. SUGAM portal also have a centralized monitoring dashboard for Ministry of health & Family welfare (MoHFW) for viewing the progress in drug regulatory clearances throughout the country. It has also enables

the senior officials in ministry to have in hand data analytics at their dashboards about the information pertaining to the clearance process of Drug regulatory.

Green e-Governance
SUGAM portal is an e-governance initiative by government of India whose aim is to make Indian Drug Regulatory office a paperless office along with enablement of ease of business. It has enabled the complete online process of application submission, application review, query issue, query response, application approval and issue of digitally signed license. In the entire workflow, there is no need to have any paper/hardcopy of file. Also the complete detail of the file is maintained in the inbuilt file tracking system with complete details of the file proceedings.

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GIS-Based Planning and Monitoring System for the Gram Panchayats
Panchayats & Rural Development Department, Government of West Bengal

Soumya Purkait and Koustuv Basu

PROJECT OVERVIEW

The Gram Panchayat (GP) is the local government in rural areas and is primarily responsible for delivery of various local services to their citizens. The functional responsibilities of GPs, expectations from their residents as well as their revenues have been increasing over the years making it necessary for augmenting capacity of the GP in areas such as administration, planning, project execution and interface with the citizens. In addition to strengthening the supply-side, there is need to put in place a strong system of state oversight including receiving feedback from the citizens about quality of services and fulfillment of their needs. This requires well-focused capacity-enhancement of the GPs and a robust system of monitoring in the service delivery mechanism.

In pursuit of the above goal, the "Institutional Strengthening of Gram Panchayats Project (ISGPP)" in West Bengal was launched to institutionally strengthened Gram Panchayats. The ISGPP aimed at strengthening the institutional processes related to functioning of the GP and planning for development of the area through a bottom-up participatory planning process and its implementation with transparency and accountability. It specifically focuses on building capacity at all levels through systemic improvement, continuous mentoring of the GP functionaries and better oversight in functioning of the GP.

Monitoring of various institutional processes and activities related to implementation of different schemes has been considered an important task under ISGPP. This required knowledge on how the process for planning is being followed, in which physical locations of the activities to be carried out and the progress made in implementation were important components. The information on progress of execution of schemes as per plans should be on real-time basis for more effectiveness. That will involve capturing information on processes as well as location and other attributes of all the field level activities related to planned implementation, processing all this information and making the same available in the website for viewing by all the stakeholders. Also, all progresses of planned activities are to be captured on areal-time basis. Capturing spatial information, analyzing the same for various purposes and making those visible in the website require developing a Geographic Information System (GIS) and appropriate application of Information and Communication Technology (ICT). The GIS based Planning and Monitoring System broadly aimed at the following:

- Promoting use of ICT tools to enhance transparency and accountability of service delivery activities for tracking the process of inclusion, participation and transparency during planning, implementation and operation and maintenance stage, monitoring and reporting of the activities implemented by the GPs in West Bengal.
- Providing "real time" monitoring of project activities along with implementation status after preparation of asset depository and gap analysis.

- Improving monitoring related to utilization of plan funds by tracking progress of activities on real time basis.
- Concurrent monitoring of project's mentoring support to GPs and its quality.
- Building capacity of decision makers in respective GPs to use ICT tools for focused, responsive and timely actions.
- Streamline regular sharing of information around location, funding, intended results by satellite based geo-referencing to effectively inform all stakeholders about planned and active projects in each GP.
- Track participation of citizens and stakeholders in Upa-Samiti (standing committee), Gram Sansad (ward level) and Gram Sabha and general (both GP level) meetings.

The GIS Process Flow:
- Tracking the "process" followed within the "given time frame" and by the "designated" personnel through the planning, implementation and Operation & Maintenance (O&M) stage for each investment.
- Preparing an asset directory for proper needs analysis in facilitation of a perceived need based integrated plan.
- Tracking physical progress of activities through which the assets are being created by GPs.
- Uploading the details of each step of the "process" at each stage i.e. planning, implementation, and O&M including Upa-Samiti/Gram Sansad/Gram Sabha/ General Meetings (with photograph) through web based forms and mobile device. Provisions for automatically capturing the Geo-coordinate and actual time of shooting the photographs.
- Data from each stage of every activity to be uploaded and synchronized with the monitoring system.
- Linking monitoring data to the base maps to showcase the results, funding, and the physical progress with scope of customization etc. Geo-tagging / geo-referencing the location from where data is being collected thereby enhancing the reliability of data when plotted on the base map to enable a "granular" analysis at the disaggregated level.
- Developing a common dashboard on the base map to monitor the physical and financial progress of activities, validate data through geo-positioning technology for decision makers to view and facilitate decision making for course correction and planning linked with perceived needs.
- Designing and develop a state of the art web based dashboard to automatically analyse the captured data and graphically represent the data on pre-defined analytical formulae on real time scenario and generate alerts.
- The Geo-Positioning System (GPS) enabled mobile phones have built in facility of storing data offline (where there is no connectivity) and to synchronize with web based online application immediately upon availability of connectivity.
- Developing a proto type and a user friendly manual for training for the end users, on field extension officials, super users and administrators.

- Providing training to end users, on field extension officers, super users and administrator on GIS based web application.
- Developing interface with existing Web based MIS of ISGP project to get the physical/financial information into ICT application for each activity executed by the respective GPs.
- At the GP level, a monthly report of the activities undertaken and completed under each program/scheme by the GPs is being generated by the system. This report contains details of the activities under the program, pictorial status before, during and after implementation and fund status.
- The consolidated monthly reports of the GPs are hierarchically summarized at the district level / Block level based on performance of the GPs against each program.
- At the State department level, a consolidated programme based progress report of all districts being generated with detailed data and graphical performance analysis of each program, district wise.
- Initially, activities/schemes taken under untied funds [13th FC grants, SFC grant, block (ISGP Project) grant and own source revenue] has been included in this initiative.

With the objectives and process flow as narrate above, a comprehensive system of GIS based planning and monitoring system was introduced to the Gram Panchayats in West Bengal and integrated to the institutional systems for planning, project execution, monitoring and supervision. The system was fully operationalized in June 2013 across the 1000 Gram Panchayats in 9 districts in the state of West Bengal. The system was introduced to the Gram Panchayats through a process of rigorous training, capacity building and handholding support to the employees and elected representatives. The government took a series of action to assign specific responsibilities to specific designations to institutionalize the GIS system within the overall scope of monitoring to promote good governance with greater transparency and accountability. As soon as the system became effective, every single planned activity with implementation details through pictorial evidence were put on public domain freely accessible to the citizens and administrators as a means of public disclosure. The key learning from the deployed GIS system is that the GPs have been empowered to use it as a spatial tool to have a digital asset repository and understand the gap between people's aspiration and availability of public goods for service delivery. In addition, the GIS system has been instrumental to introduce highly sophisticated satellite technology for planning and monitoring by the GPs has been absorbed by the institution as a technological solution to do more things with less effort and resources.

RESULT INDICATORS
Key Performance
Presently the web based monitoring system is reaching 1000 Gram Panchayats in 9 Districts in the state of West Bengal. On average, in West Bengal, one GP is comprised of a population of 22,000. Therefore, the application is covering approximately 2,20,00,000 rural people which is a quarter of the state's population. At the GP level, about 7,000 GP employees and 12,000 elected representatives are benefitted from this system not only for day to day monitoring but also their burden

of reporting has gone down significantly. The system also benefits the administrators at Block, Sub-Division, District and state level with availability of GP-wise disaggregated data and various reports at their desktop, as each level of administrative heads (from BDO to District Magistrate) have been provided with individual user id. In addition to this, the system functions on real-time satellite coordinates for tracking of institutional performance and project execution based on annual integrated plan of the Gram Panchayats (GPs) which is a first of its kind in Panchayati Raj Institutions (PRIs) in the country, enabling participatory, accountable and transparent local self-governance. GP-wise geo-referenced map has been created for 1000 GPs in West Bengal. Customized mobile application has been developed to capture field data on project execution with latitude and longitude, image, video with time stamp wherever relevant. Each GP has been given a GPS enabled mobile phone for this purpose. The map is used as a repository for public amenities that is useful for need based planning. Key decision making process like Gram Sansad, Gram Sabha, General Body Meeting and Sub-Committee Meetings are being captured with the help of this phone for factual evidence. The GIS feature is linked with the existing online monitoring facility of the Panchayats and Rural Development Department to plot the physical and financial progress on the geo-referenced map. Both the MIS and GIS modules of the software are accessible to all citizens in order to promote inclusive governance and increase transparency and accountability in Gram Panchayat functioning and service delivery.

The end users have been trained through District and Block level workshops held state-wide. 03 rounds of training have been completed for the end users already to get them familiarise with the system. On-field trainers have gone through training of trainers (ToT) programme for providing regular support on operation and maintenance to the end users at GP level. Server has been procured and deployed at the State Data Centre for hosting the system. Summary of core Gram Panchayat level Assets Geo tagged through GIS based system:

Table: Asset description

Sl. No.	Description of the Asset	Number/ Length
1	Educational Institutions (Primary, Upper Primary, High School, SSK, MSK, Adult Education Centre, College, Library, Madrassa, Vocation Training Centres etc.)	21974
2	Health Institutions (Ayurvedic Dispensary, Homeopathic Dispensary, Allopathic Dispensary, Block Primary Health Centre, Pathological Laboratory, Nursing Home, Rural Hospital, Primary Health Centre etc.)	5133
3	ICDS(Mother and Child Care Centre)	18318
4	Drinking Water Sources(Tube well, Mini Deep Tube well)	173725
5	Market(Haat, Kisaan Mandi, Market Complex, Village Market)	1417
6	Waste Management Unit(Solid Waste Management unit, Liquid Waste Management Unit and Solid and Liquid Waste Management Unit)	44
7	Water Bodies(Reservoir, Check Dam)	1643

Sl. No.	Description of the Asset	Number/ Length
8	Animal Resource (Animal Husbandry, Artificial Insemination Centre, Milk Collection Centre)	2643
9	Utility (Bank, Cold Storage, Ration Shop, Post Office and Graveyard etc.)	8496
10	Drain (Pucca and Kuchcha Drain)	180 Km.
11	Road (Black Top, Concrete, Morum, Earthen etc.)	57376 Km.
12	Government Offices (Block Development offices, Police Station, GP Office etc.)	2512
13	Others (Cycle/Motorbike Stand, Rail Station, SHG Cluster Building, Factory Area etc.)	12019

Implementation coverage

The GIS based planning and monitoring system took off with the 1000 project GPs in 9 project districts. It took about two years to get the entire system stabilized after a series of value addition to the application time to time. From January 2016, the GIS based planning and monitoring system has been expanded to the 682 non-project GPs in the project district. After initial rounds of capacity building, the GPs have started preparing the electronic map which is the base of the entire initiative. Therefore, the present coverage of the GIS initiative is all the 1682 GPs in 9 project district. The district wise total numbers of GP using this application are given in the following Table:

Table: Description wise number of GPs

District	No. of GPs	District	No. of GPs
Bankura	190	Howrah	157
Birbhum	167	Nadia	185
Burdwan	277	PaschimMedinipur	290
Cooch Behar	128	PurbaMedinipur	223
DakshinDinajpur	64	**Total**	**1681**

The GIS Application has been launched in 998 GPs initially in 2014. This number comprised the GPs that were identified to be under ISGP Project intervention among the nine districts. During the past year, the GIS Application implementation was extended to 683 more so as to cover all the GPs of the nine districts under ISGP Project. During the past year, The GIS Application has been enhanced to add the Drinking Water Sources Capturing Module in the application. This module is meant for capturing the drinking water sources (DWS) within the Gram Panchayat area as a major service to the citizens. This module caters to the process of planning in terms of assessing the requirement of new installation of drinking water sources proportionate to the population along with operation and maintenance of the existing drinking water sources. The Drinking Water Sources Capturing Module was added as it was very important to accommodate all tube-wells (GP owned/managed) in the GP asset repository and aid spatial planning. In addition, as

one of the core indicator to institutional functioning, it was imperative to capture General Body (including special meetings) and Upa-Samiti Meetings in the GIS system. Hence these features were also added in the Application.

Outcomes in terms of Efficiency, Improvements and integration

Introduction of GIS based technology to Gram Panchayat monitoring is a rich value addition to the state oversight run by a comprehensive web based application. The GIS protocol has been designed in a way that it validates the progress with regard to planning, institutional functioning, people centric governance with the help of GPS technology. The GIS protocol has been integrated with the database of existing web based MIS to produce a monitoring system in the Panchayati Raj Institution and the first of its kind in the country. The GIS based system functions on real-time satellite coordinates for tracking of project execution based on approved annual integrated plan of the Gram Panchayats. In addition, this system is also capable of capturing key decision making process of the Gram Panchayat through various meetings. The followings are the salient feature of the GIS based real time monitoring system:

- Gram Panchayat-wise geo-referenced base map has been created for 1000 Project Gram Panchayats.
- Customized Android mobile application has been designed and developed to capture field level data on project execution with latitude and longitude, image, date and time stamp. Each Gram Panchayat has been given a GPS enabled mobile handset for this purpose.
- Gram Sansad, Gram Sabha, General Body Meeting and Upa-Samiti Meetings are also being captured with the help of this android phone with latitude and longitude, image, date and time stamp, audio and video for factual evidence.
- The GIS based real time monitoring system has been linked with the existing MIS of the Panchayats and Rural Development Department to plot the physical and financial progress on the geo-referenced map.
- Comprehensive web-enabled software has been designed and developed with dedicated access of the Gram Panchayats, Blocks, District and State Administration to strengthen oversight.
- The system is also open to the citizens to promote inclusive governance and increase the degree of transparency and accountability in Gram Panchayat monitoring.
- This is the only GIS based monitoring system for the Gram Panchayats in the entire country.

Time and cost efficiency improvements
- *Capital Expenditure* -INR 18.5 Thousand per GP for 1000 GPs.
- *Cost of Mobile Phone, Software Development, Setting Up IT Infrastructure* -INR 17 Thousand per Gram Panchayat.
- *Cost of Foundation and Refreshers Training* (5 Sessions for GP functionaries of each Gram Panchayat) -INR 1.5 Thousand per Gram Panchayat.
- *Total Project Cost* -INR 1.85 Crore for 1000 Gram Panchayats.
- *Recurring Expenditure* -INR 130 per GP per Month(for mobile internet – borne by GPs).

- *Cost for Replication* -INR 1.50 Crore (for Rest of the state).
- *Cost of Mobile Phones* - INR 6 Thousand per GP for 2235 GPs.

Specific innovative ideas implemented

The web system has both MIS and GIS modules. With MIS module, user can generate different graphical and tabular reports. It is possible to extract information or make analysis on a wide range of themes for which the person concerned has been properly oriented. With GIS module, queries and analysis of the plan could be seen on thematic maps to show spatial features for easier visualization of the output and internalization of the same. This is especially useful in ensuring convergence of various activities and in knowing all the works that are being taken up in a certain geographic area within the GP. All information related to works planned, being implemented or completed in any GP can be seen on the web-map of the GP along with photographs and video clips using dashboard or queries, as mentioned before. Users will be able to identify the location of any work, see the photograph and compare all attributes of the physical facility shown in the web-map with what he/she can see on the ground. Simple viewing has been made easier as well. They are now in a position to report/question any discrepancy. Thus, transparency and reliability of the information will be of very high order with all the attributes are disclosed on the exact location on the map.

Extent of integration

The GIS system is integrated with the MIS system of the ISGP Project. The extent of functional integration with the ICT system is explained in the immediate previous clause. Technically, the integration is achieved through offline data exchange through XML files. The annual plan data of a Gram Panchayat is extracted through an XML file and loaded into the GIS system on daily basis. Thus update on any activity related to the plan in MIS system gets reflected in the GIS system the following day, enabling the GP functionaries to upload geo tagged data into the GIS system related to the annual plan item through the mobile apps. The ISGP Project has definite plan for online integration of the MIS and GIS systems in the near future, thereby enabling real time update of MIS system data in to the GIS system.

ENABLER INDICATORS
Process reengineering

- *Process* – Gram Panchayats used to prepare a plan document for a particular financial year that was generally not accessible by the citizens.
- *Change* - ICT tools are being used to enhance transparency and accountability of service delivery activities for tracking the process of inclusion, participation and transparency during planning, implementation and operation and maintenance stage, monitoring and reporting of the activities implemented by the Gram Panchayats in West Bengal.
- *Process* - Site visit was the only means to review the progress of implementation of schemes and reviewing actual bills, vouchers and cash book could provide information about financial progress of schemes implemented.

- *Change* - Streamline regular sharing of information around location, funding, intended results by satellite based geo-referencing to effectively inform all stakeholders about planned and active projects in each Gram Panchayat.
- *Process* - Tabular reports were the only source to track the attendance of Gram Sansad and Gram Sabha meetings. Locations were not tracked in the traditional monitoring system of Gram Sansad and Gram Sabha meetings.
- *Change* - Track participation of citizens and stakeholders in Gram Sansad and Gram Sabha meetings with locations through visuals (geo- tagged photographs and videos of the meeting).
- *Process* - Usually progress status reports for implementation are received on monthly basis.
- *Change*–The GIS based system provides "real time" monitoring of project activities along with visual implementation status.

Challenges faced in implementing Process change:

The Panchayati Raj Institution officials, especially the Gram Panchayat officials, were not aware of the use of ICT tools. As such, building the capacity of decision makers in respective Gram Panchayats to use the ICT tools for focused, responsive and timely actions was a major challenge.

The Lessons learnt from the Process re-engineering exercise:

Prior to the implementation of the system, the end users need to be trained through District and Block level workshops that are held state-wide. Multiple rounds of training are required for the end users in order to make them familiarize with the system. On-field trainers are required to be enabled through training of trainers (ToT) programme for providing regular hand holding support on operation and maintenance to the end users at Gram Panchayat level.

Best practices adopted from the industry/ other State implementations

- Linking monitoring data to the geo-referenced maps to showcase the results, funding, and the physical progress with scope of customization. Geo-tagging the location thereby enhancing the reliability of data on the base-map
- Developing a common dashboard on the base map to monitor the physical and financial progress of activities, validate data through geo-positioning technology for decision makers to facilitate decision making for course correction;
- The Geo-Positioning System (GPS) enabled mobile phone have built in facility of storing data offline (where there is no connectivity) and to synchronize with web based online application immediately upon availability of net connectivity

Leadership, Change Management, Capacity Building

- Leadership support for the initiative, visibility of actions with current status.

- Change management and capacity building strategy defined and status thereof.
- Project management & monitoring adopted.

Technology
- The entire technology stack based on open systems (except for mobile app platform) has been adopted for this system. The system is hosted on the West Bengal State Data Center. There are mobile apps associates with the project that are used for on-filled capturing of geo-tagged data pertaining to activities of the project such as – statutory meetings by citizens, execution of planned infrastructural work, and base map updation with the assets within the Gram Panchayat.
- S/W maintenance – It is done by an in-house team of developers. Proposed to be outsourced in future.
- H/W maintenance – It is done by the OEM through warranty and AMC contracts
- N/W maintenance – This is done by the State Data Centre (SDC) as the servers are hosted in their premises.
- The system is hosted on the West Bengal State Data Center. Prior to hosting, the application has been audited for security compliance by a Cert-in empanelled auditor as per GoI guidelines. The VA/PT tests on the servers have been conducted followed by hardening of the servers.
- There is a daily incremental back up policy with complete back up taken on weekly, monthly and yearly basis. The mechanism for taking back up is through tape drives and SDC Infrastructure team operates and preserves the back up. Disaster back up – There is a server facility provided at a private entity where a replica of the live environment maintained for development/enhancement purpose. This can be used as a DR site when required.
- The ISGP Project has used the social media platforms extensively – Youtube, Facebook, Twitter, Pinterest, Instagram and LinkedIn. Publicity videos on the Project have been aired as TV commercials and have been uploaded to Youtube. Communications, events related to the project are regularly updated in Facebook and twitter for dissemination.

Technology related challenges
- Internet connectivity in the rural (Gram Panchayat) areas has been an issue of major challenge. The entire system has been optimized to be operated on 2G network
- Mobile network availability: Intermittent to no network at times.
- Digital literacy of Gram Panchayat functionaries has been another major challenge. Rigorous training and intensive handholding support to GP elected representatives and employees have been undertaken

The Lessons learnt from Technology choices and implementation strategy
- To overcome the Internet connectivity issue, the entire system has been optimized to be operated on 2G network.

- The mobile applications have been designed in a way that in case of weak/poor mobile connectivity, the data will be saved in the phone's memory. The saved data can be synchronized with the web server on availability of internet connectivity later. Uploading the saved data from a different location on a different date-time will not affect the actual lat-long and date-time information of the saved data.
- Rigorous training and intensive handholding support to GP elected representatives and employees have been undertaken to enhance the digital literacy of the GP functionaries.

VALUE INDICATORS
Digital Inclusion

The objective of this GIS initiative is to enable the Gram Panchayat functionaries to upload the status of their annual plan execution with geo tagged photographs and videos through mobile phone apps. As the users of the mobile phone apps are in every Gram Panchayats across the state, the instruction audio-visuals have been provided on the GIS website in local language. Thus Gram Panchayat functionaries across all districts of the state can download these audio-visuals that contain instructions to use the application in simple steps having graphics with voice over in the local language and use the system effectively.

Green e-Governance

The servers for the GIS Application have been procured by the project and are hosted in the West Bengal State Data Centre (SDC). The SDC ensures that green computing practices are followed for operation and maintenance of the servers. At the client side, the GP functionaries and their mentors are provided with laptops and mobile phones for accessing and operating the systems. These laptops and mobile phones are procured by ensuring they are compliant with the industry benchmark for green computing. Once any laptop or mobile phone need to be upgraded, new devices is provided to the functionary and the old device

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e-Revenue
Office of Collector, North Goa

Nila Mohanan and Sangeeta Shirodkar

PROJECT OVERVIEW

e-Revenue is a platform that integrates e-governance and mobile governance so that the various services provided by Collectorate North Goa pertaining to the Revenue Department can be made more timely, accessible and citizen-centric. Through this platform, the services that are in high demand like issuing of certificates, partitioning of land and converting land use are streamlined and made online, so that citizens are able to access them through a single window and the functions of the concerned departments are integrated. Furthermore, it has made the functioning of Collectorate, North Goa and all sub-divisional offices more transparent, effective and time-bound. The Collector of North Goa district envisaged the whole project, formulated the core concept, associated communication plans, project plans and deadlines, and continuously monitors the project to ensure its continued success. The main objectives of the Initiative are:

- To make the services of issuing of certificates, partition and conversion of land readily accessible and responsive to the needs of the public by harnessing the potential of e-governance and m-governance.
- To set well-defined time lines for each and every step involved in processing the applications so that time over-runs are avoided and time-bound service delivery is ensured.
- To keep the applicant informed about the status of his/her application through system-generated SMS at each and every stage, so that the applicant need not visit the Collectorate/Sub-divisional offices repeatedly, to know the status.
- To avoid pendency and ensure transparency in service delivery.

The main beneficiaries of the project are the citizens of North Goa. This service covers all the 5 Talukas and 107 Village Panchayats of North Goa District, thus benefiting a total population of over 7 lakh.

RESULT INDICATORS
Key Performance
Services that are currently being delivered using ICT

- Services being delivered using ICT are of G2C, G2B nature. The list of services that are delivered to the citizen of North Goa are: a) Issuance of Residence Certificate, Caste Certificate, Divergence Certificate, Income Certificate b) Single Window for Partition of Land c) Single Window for Partition of Land d) SMS based Facilitation service for Mutation

Benefits obtained from these services

To organization

- Rejections are low as the documents are verified by Talathi during application. Hence less time is taken in processing.
- Talathis need not visit the taluka office for submitting the talathi report, thereby saving time in travelling. This enhances quick service delivery
- Data entry is online, thereby speeding up the entire process.
- The time required for coordination between Directorate of Survey and Land Records (DSLR), Town & Country Planning, Dy. Conservator of Forest and Collector/ Sub-divisional Officer is reduced.
- Online Memorandum/Reports submitted by the Collector, Dy. Collector, Mamlatdar, Dy. Conservator of Forests, TCP and DSLR reduces time and resources needed to send the memorandum to different departments and get reports.
- Joint Inspection facilitates the work of individual departments, who need not conduct site visits separately. This saves the travelling cost of vehicles since all the three departments will inspect the site on the same day.

To Citizens

- Village level Services are available at the nearest Talathi offices that are located in every Village Panchayat. Citizens need not travel all the way to the Taluka Office.
- Delivery of services to citizen through single window is achieved in a time-bound manner.
- Automated SMS alerts and status can be checked via Village level delivery portal.
- Transparency is ensured by sending SMS to applicant to inform about status at every step, so that applicant need not visit the Government office time
- Processing time for Conversion, Partition and mutation of Land is cut down from 6-8 months to 3-4 months. Certificates are issued within the same day or latest by the next day. This has brought down the pendency rates by about 50%.
- All steps of partition, conversion and mutation processes are integrated into the single window system, thus streamlining the workflow and making the service delivery timely, accessible and citizen-centric.
- The citizen does not have to visit TCP, Forest, Mamlatdar or DSLR offices to follow up. He/she visits only the Collector/Dy. Collector office only. Date / Time of joint inspection is fixed in advance and intimated by SMS to the applicant so that his/her repeated travelling costs to the inspection site is reduced.

Other Stakeholders

- The single window system which involves other departments has helped these offices to streamline their own processes linked with partition, conversion and mutation of land

Table: Year-wise transaction volumes for various services

Services offered	Transaction volume for Financial Year			
	2013-14	2014-15	2015-16	2016-17 till August
Village level Delivery of services North Goa	3698	9357	26609	21143
Single Window for Partition of Land	-	231	1502	776
Single Window for Conversion of Land	-	5	543	268
SMS based Facilitation service for Mutation of Land	-		81	1065

Implementation coverage

The village level service delivery module of e-Revenue was first tested in pilot phase in Bicholim Taluka across 19 Talathi offices and was subsequently replicated across the complete district to cover all 107 Panchayats, after the overwhelming response from the public. Additional modules of the single window for partition and conversion were then added in 2015 and introduced in a single taluka on pilot basis and then within a month, it was replicated for all the 5 talukas of the district. In July 2016, the SMS based mutation facilitation service has also been added on to the e-Revenue service platform.

Following services are offered by the Office of Collector North Goa through the platform of e-Revenue:

Village Level Delivery of Services to Citizens

The concept of Village Level Delivery of Services to Citizens involves delivery of services particularly issuance of certificates i.e. residence, income, divergence, Form I & XIV and caste certificates, to the citizens at the grass root level through the Talathi offices, rather than having the citizens travel all the way to the Taluka or Sub-divisional Headquarters. The applicant submits the application along with all the relevant documents to the Talathi concerned at Gram Panchayat office or feeds the details online. The Talathi enters the details of the application in the system along with the mobile number of the applicant and scans and uploads the documents. He/she also submits his/her report online and submits the application with the report to the Mamlatdar for approval through the online system. The Mamlatdar views the application and all the associated documents through the online system along with the report of the Talathi and approves or rejects the application with reason. The applicant then visits the Talathi office where Talathi prints the certificate authorised by Mamlatdar and issues with his certification to the applicant. At each of these steps, SMS alerts are sent to the applicant to keep him/her informed about the status of the application. The certificates are issued to the applicant on the same day or latest by the very next day, since the processing is entirely done online.

Single Window for Partition of Land

This is a totally work flow based system wherein every application from its inward point to the processing and its movement to the line department, the Directorate of

Survey Settlement and Land Records (DSLR) is tracked online. The applicant can apply and get the partition order through a single window at the Deputy Collector's office, instead of going to different departments and offices. The Applicant files the application along with the documents at Deputy Collector of the respective taluka an acknowledgement number is generated and the same is intimated to the applicant by SMS. Notifications through SMS are given to the public giving status of his/her application at every stage. Any deficiencies in the documents are also intimated through SMS. The various steps involved in processing the partition application are closely monitored online. The system is integrated with the DSLR to ensure that the applicant need not visit another Department for payment of fees or fixing of dates for survey of land, as was the case earlier. All this is now done through the single window at the Deputy Collector's office.

Single Window for Conversion of Land Use
The North Goa District is also implementing Single Window for conversion wherein the Public needs to visit only a single office to get the entire process of Conversion completed. The system integrates the functionalities of five concerned Departments namely:

- Collectorate/Dy.Collector North Goa
- Office of Mamlatdar- North Goa
- Town and Country Planning (TCP)
- Office of the Dy. Conservator of Forest
- Directorate of Survey Settlement and Land Records (DSLR)

The Applicant files the application along with the documents at Collector /Deputy Collector. An acknowledgement number is generated and the same is intimated to the applicant by SMS. Any deficiencies in the documents are also intimated through SMS. All the reports required from the line departments are submitted online by the respective departments and after they are verified, the case is forwarded online to the DSLR for preparation of the survey report. The conversion sanad (order) is prepared and then issued to the applicant. This is a huge improvement over the earlier system wherein, applications were processed manually and lots of correspondence with line departments was done through normal tapal, thus creating avoidable time lags. Further, the applicant earlier had to go to each department individually to follow up his/her application and get the reports sent to the Collector/Deputy Collector; but in the single window system, all this is done at the click of a button and the applicant is kept informed through SMS at each and every step. Well-defined time limits are set for each of the steps, thus enabling the complete process of issuing conversion sanad to be completed in a maximum period of 3 months, whereas earlier, the process used to take nothing less than 6-8 months on an average.

SMS based Facilitation service for Mutation
The system is totally integrated with Dharani Software of NIC. SMS intimation to the applicants is sent at every stage to keep them informed about the progress of their application and to ensure timely action from their end. The online monitoring of the process ensures that the service is delivered in a time bound manner. There is total transparency in processing of the application as each and every step is tracked

online. Efficient tracking mechanism is introduced through SMS & online system. The status of application can be checked on www.northgoa.gov.in.

Outcomes in terms of Efficiency, Improvements and integration

Table: Efficiency Improvement

Service	Before	After	
Time effectiveness		**Citizen**	**Department**
Village Level Delivery	Applicant had to visit Mamlatdar/Dy. Collector office at taluka for submitting application. The talathi on his visits would collect these applications once scrutinized by the respective Mamlatdars. The Talathi had to visit the taluka office again to submit the report. All this resulted in huge time over-runs, with the issuing of certificates getting delayed upto 15 days	Faster processing of application due to Movement of documents online and on real-time basis and the major time lag on account of submission of Talathi report is eliminated. Service time is one day	Rejections are low as the documents are verified by Talathi during application. Hence less time is taken in processing. Talathis need not visit the taluka office for submitting the talathi report, thereby saving time in travelling.
Single Window for Conversion Partition	The applicant had to visit the Collector/Dy. Collector office to submit the application. Further he/she had to make repeated visits to know the status. The site inspection report of Mamlatdar, TCP and Dy. Con Forest would take a lot of time. There was no time limit for survey to be conducted by Survey department. On an average, conversion and Partition was done only in 8-10 months.	With single window system implemented. Applicant visits the Collector/Dy. Collector's office only. Joint Inspection by all concerned departments is held on the same day. Sanad, Partition Orders are issued within a maximum period of 3- 4 months.	Data entry is online. Coordination time between Department of Settlement and Land Records is reduced. Online Memorandum/Reports submitted, reduces time and resources needed to send the memorandum to different departments and get reports.

Cost effectiveness			
Village Level Delivery	Applicant had to make number of visits to the Mamlatdar/Dy. Collector office at taluka level to know the status of his application. He had to travel from village to taluka level which involved lot of cost. Similarly the talathi frequent visits to collect the applications and submit the talathi report also involved cost factor which had to be borne by the department.	Service available at nearest Village Panchayat office No need for citizen to visit Taluka Office thereby reducing cost of travel	Talathis need not visit the taluka office for collecting The application or submitting the talathi report
Single Window for Conversion Partition and mutation	The applicant had to visit the Collector/Dy. Collector office to receive the acknowledgment, and had to carry the memorandum copies to the respective Mamlatdar, TCP and Dy. Con Forest. The cost factor involved in travel was very high. The applicant also had to make frequent visits to the site for inspection at his/her own cost. Similarly he/she had to travel to DSLR offices to enquire the status of survey report. The Department too had difficulty contacting applicants in time.	The citizen does not have to visit TCP, Forest, Mamlatdar or DSLR offices to follow up. He/she visits only the Collector/Dy. Collector office only. Date / Time of joint inspection is fixed in advance and intimated by SMS to the applicant so that his/her repeated travelling costs to the inspection site is reduced	Joint Inspection facilitates the work of individual departments, who need not conduct site visits separately. This saves the travelling cost of vehicles since all the three departments will inspect the site on the same day. Further, prior intimation to applicant by SMS ensures his/her presence, thus avoiding the need for repeated sitevisits by the department.

Specific innovative ideas implemented in e-Gov area and their impact on services:
- The initiative was first of its kind to link the line departments horizontally concerned with the processing of an application. A single window in the system meant a single window across departments and not just within the Collectorate. This is a major innovation

- The Village Level services connect applicant's data with their documents. Hence online reusability of documents is possible while applying for any other certificates.

ENABLER INDICATORS
Process reengineering

The e-Revenue platform ensures that the services provided by the Collectorate are easily accessible to the citizens' right up to the grass root. Village level service delivery is available at the level of the talathi in all 107 Panchayats of the district. Transparency is ensured in service delivery by keeping the applicants constantly informed about the status of their applications through SMS's generated at every stage. Further, since the entire processing of the application is computerized, all the details are instantly visible. This increases the accountability of the staff and officers involved in offering the service. Effective integration of the functions of the line departments that have a role in processing the applications with the single window system has been done, thus providing a single point of access to the citizen. This avoids the need to go to different departments repeatedly to follow up applications. Processing time for conversion and partition of land is cut down from 6-8 months to 3-4 months. Certificates are issued within the same day or latest by next day. This has brought down the pendency rates by 50 %.Prior to computerization the applicant had to make minimal 10 visits to the departments and processing time was unlimited. The current computerized time bound system reduced the visits to 2-4 times at a single window i.e. Dy. Collector office. Optimum utilization of m-Governance is achieved by using SMS's as the medium of communication to the citizens. Online tracking of the applications processed on e-Revenue has also been enabled.

Challenges faced in implementing Process changes

- Motivating citizens to use website to track and monitor application status: Wide publicity was given in form of advertisement and also through the office of Mamlatdars and Dy. Collector. Launch program of the above services was conducted through local representative so that the public is well aware with the online village level services.
- Reporting of ICT system failure: Maintenance engineers were placed and continuous coordination with GBBN Network provider was made. AMC was done with the hardware vendor and engineers were placed to resolve the ICT issues. Call Log system for calls was also put in place, so that resolving period is tapped and then appropriate action was initiated. Thus continuous monitoring and evaluation was done.
- Lack of effective knowledge management practice was key challenge for storage & retrieval of information for supporting continuous change management. Also the poor levels of ICT operation capacity by ground level staff was a major challenge faced in change management which had to be overcome through rigorous handholding.

The Lessons learnt from the Process re-engineering exercise:

- It was observed that regular follow up with the officers and staff at various levels of implementation was a pre-requisite to make the new workflow

successful and effective, as there were a number of operational issues that were raised especially by the staff, which could be ironed out without delay because of the constant interaction that was maintained with them.

Leadership, Change Management, Capacity Building

Leadership support for the initiative: The entire organization of Collectorate, North Goa right from the officers of the Collectorate North Goa, including the Collector, Additional Collectors, Deputy Collectors and Mamlatdars to the officials including the Talathis and the concerned staff have all played an integral role in ensuring the successful implementation of the project. As the main stakeholders, they have accepted the initiative, tried to improve its performance over time and strictly adhere to the key goals and objectives of the project. The Collector of North Goa district envisaged the whole project, formulated the core concept, associated communication plans, project plans and deadlines, and continuously monitors the project to ensure its continued success.

Project management & Monitoring adopted: The village level service delivery was first tested in pilot phase in one taluka across 19 Talathi offices and was subsequently replicated across the complete district to cover all 107 Panchayats, after the overwhelming response from the public. Similarly, the single window for partition and conversion were first introduced in a single taluka on pilot basis and then within a month, it was replicated for all the 5 talukas of the district. Maximum utilization of mobile governance is also achieved.

Change management and Capacity building strategy:
- There was a risk of failure of system due to change which was mitigated well by thorough capacity building and ensuring participative approach of the ground level staff, in designing of the system. The adaptability built into the system reduces the failure risk drastically.
- Continuous training accompanied with a planned ICT Infrastructure and maintenance contract ensured participative approach and success. ICT support Engineers are assigned at Mamlatdar and Dy. Collector offices to provide support and feedback for running the project smoothly

Financial model adopted

The application is developed and monitored through a State Corporation M/s. Goa Electronics Limited, which in association with the district administration studied the existing process as per the manual system in detailed and incorporated features that would make service delivery more effective and citizen centric. Feedback was also taken by the district administration from the citizens, Sarpanchs, Panchayat secretary etc to determine the structure of the e-Revenue platform. For sustainability of the project, continuous enhancement of the project is required based on talathi, Mamlatdar and Dy. Collector feedback which in turn will ensure that the system is in sync with the changes in the process. This is constantly ensured through regular review meetings with these functionaries.

Challenges faced in transition

- *Motivating citizens to use website to track and monitor application status:* Wide publicity was given in form of advertisement and also through the office of Mamlatdars and Dy Collector. Launch program of the above services was conducted through local representative so that the public is well aware with the online village level services.
- *Reporting of ICT system failure:* Maintenance engineers were placed and continuous coordination with GBBN Network provider was made. AMC was done with the hardware vendor and engineers were placed to resolve the ICT issues. Call Log system for calls was also put in place, so that resolving period is tapped and then appropriate action was initiated. Thus continuous monitoring and evaluation was done.
- Lack of effective knowledge management practice was key challenge for storage & retrieval of information for supporting continuous change management. Also the poor levels of ICT operation capacity by ground level staff was a major challenge faced in change management which had to be overcome through rigorous handholding.

The Lessons learnt from Change Management and Capacity building

The importance of involving the stakeholders within the government and from the public in change management was realized, because various positive suggestions were offered by them, which helped in fine-tuning the new processes. Similarly, it was understood that continuous capacity building is the backbone of any new e-governance project, since the changes in the processes were to be internalized by each and every person involved in executing them.

Technology

Technological solution adopted

It is a 3–tier centralized web based application developed using ASP.NET with C# (3.5 Framework) and SQL Server 2000. The application is hosted on and State Data Centre and uses a SWAN.

Compliance of the Technology adopted with e-Government standards

All the e-governance standards are followed in development and execution.

Strategy for Disaster Recovery and service continuity

- Daily backups are maintained at server and development end. DBA constantly does the load analysis to ensure that all schemes use a healthy pool of resources. Transaction logs are maintained for rollback and correction of all scheme related data.

The Lessons learnt from Technology choices and implementation strategy

Three types of training were conducted for all level of staff namely

- Sensitization programmes were conducted for Mamlatdars, Dy. Collectors and Talathi's.
- Introductory Session was introduced to make them know the complete work flow of application processing.
- Hand-ons' training for the Talathi level who are the delivery outlet of the services.

Getting the talathi's to operate the system, by providing thorough training sessions. Continuous monitoring of the issuance of certificate was done. If there was fall in number of certificates, requisite evaluation was done by seeking response in terms of why the number was reducing. Rejection lists were analysed to ensure no application is rejected without genuine reason. Maintenance support was tied up with Implementing Agency i.e. GEL to ensure smooth functioning of the system. Continuous training accompanied with a planned ICT Infrastructure and maintenance contract ensured participative approach and success. ICT support Engineers are assigned at Mamlatdar and Dy. Collector offices to provide support and feedback for running the project smoothly.

VALUE INDICATORS

The e-Revenue platform has been designed in a way that is easily replicable and scalable across districts and across the State. The concept of the single window as a system across department and not just within the Collectorate makes it very adaptable to modifications and ensures its replicability across different types of services. For instance, the single window system which was initially developed for simplifying partition was subsequently and in a very short span of time in only 4 months was adapted to include conversions as well. In fact the same system is used for simplifying Mutations in North Goa District. The system was designed using masters so that adding of new services and offices is made easier. The system is designed in a totally user friendly manner with minimal data entry and after taking inputs from the ground staff who are to use it. All hardware and server configurations were designed considering four-fold increase in the coming decade. Today the system is being totally operated by the staff of the department without the intervention of an external agency.

Digital Inclusion

The primary source of communication in Goa is English. All the Government correspondences use English as a medium. Therefore the e-Revenue platform is also based in English. However, the applicants are given assistance by the Talathis/ Dealing Hands to fill up their applications, if required. Further, all demographic groups are able to access this initiative through the presence of the Talathi at the village level and helpdesks at the sub-divisional and District Headquarter.

Green e-Governance

A lot of paper work was necessary to process the applications manually and to correspond with various departments. This SMS based system eliminates the use of paper for intimation of status of application to the public. Moreover inter departmental communication is done entirely online, thereby drastically cutting down the use of paper. Thus through the village level delivery e-governance and m-Governance has been decentralized by ensuring last mile connectivity right up-to the village level Panchayat.

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Village Profile and Taluka Planning Atlas
General Administration Department (Planning), Government of Gujarat

S. Aparna and S. K. Hudda

PROJECT OVERVIEW

All the line departments of the State Government are working for the development of villages creating facilities/services at village level.

To incorporate qualitative change in the planning process particularly in decentralized district planning, it is immensely necessary to have timely, reliable and credible socio-economic data as well as Information regarding existing infrastructure facilities/services available at grass root level and the missing facilities/services.

An integration of all the required information on a single portal integrated with GIS technology would be very helpful to the decision makers to a great extent in analyzing the gaps and taking decision about the allocation of resources and need based selection of works/ amenities/services to be provided for the balance regional development of the area.

Objectives of the project

- To develop and institutionalize spatial planning process in the state through an acceptable, adoptable, and affordable GIS based Decision Support System and visualization at various levels of hierarchies.
- To provide within the decentralized structure of the system; timely, reliable and credible socio-economic statistics.
- To assist grass root level planning and decision making; leading to balanced regional development of the State to meet an overall objective of improving the Human Development.

Description of the project

In view of the above objectives "Village Profile and Taluka Planning Atlas", a Geographical Information System (GIS) based Decision Support System with the technical support of 'Bhaskaracharya Institute for Space Applications and Geo-Informatics' (BISAG) has been developed.

The system is administered by General Administrative Department (Planning) Division and Directorate of Economics and Statistics. It is designed to grasp infrastructural amenities at sub district i.e., Taluka and village levels. In this Portal 300+data items relating to the services/amenities available at village level covering 11 sectors i.e. Demography, Education, Health, Electrification, Animal Husbandry, Irrigation, Land Use, Roads & Transportation, Communication, Water Supply & Sanitation and Community Development have been collected and entered into the centralized database and being updated regularly in this online portal.

The portal has been developed integrating the above mentioned data with spatial data (Taluka maps with village boundary).

This portal provides village level data with Taluka maps showing village boundary. Apart from maps depicting availability of amenities/services the system (portal) also provide various reports.

Schedule for data collection devised on the basis of
- Assessment of earlier Village amenity Survey
- Expert inputs from:
    - All concerned Departments and the Committee of Secretaries
    - Reputed institutes and Universities involved in preparation of DHDR
- Pilot survey conducted in two Talukas viz. Kaprada and Jambughoda.

Distinctive features of the project
- Truly less paper mechanism which saves time, man-hours and multilevel correspondence to get the information.
- Provides gap analysis for local level decision-making and effective planning.
- System enables correlation of indicators across sectors.
- Provides Key Indicators for the inclusive development of Talukas.
- Portal also enables integration across different data sets and across different sectors at the village and Taluka level.
- Base line data helps to monitor the progress made under different sectors and set benchmarks for performance budgeting.
- Helps to improve Human Development Index (HDI) as it identifies the focus areas for improvement.

Challenges faced before deployment of the project
- The availability of relevant and authentic data in an easily intelligible form is an important requirement for any kind of planning. Due to lack of integrated database of status of various amenities/services available at village level, decentralized development planning; used to be based on an approach that is essentially demand driven. Development works are taken up by the District Planning Board based on requirements articulated by the local representatives and functionaries.
- All stakeholders associated with planning process like Collectors, District Development Officers and also MLAs/MPs and elected representatives wants to develop their Taluka/District/Constituency in a balanced manner and to allocate resources in an equitable manner. For this they are in need of reliable information about the availability of facilities/services at village level and also in easily understandable format. Data was available, but at different sources/offices, so it was difficult to decide the allocation of resources and to select villages to provide specific facility/service in terms of balanced development.
- To facilitate planning machinery in their decision making as part of decentralized district planning and to avoid duplication of works undertaken by different line departments and also to facilitate them in equitable and need based allocation of resource for balanced regional development in the state this project was initiated.

RESULT INDICATORS
Key Performance

As mentioned earlier the portal is aimed at facilitating decision makers; more specifically at district level in gap analysis and taking decision about where and for what the resources need to be allocated for balanced regional development.

With the development of the portal all stakeholders are using the portal. The brief of how the stakeholders are being benefited is mentioned in following paragraphs.

To organization (The State and District planning machineries)
With the help of Taluka Planning Atlas and Gap Analysis done using the information available from the portal, planners particularly at District level (Collectors, DDOs and DPOs) benefitted to carryout need based planning. They select the villages where some specific services to be strengthened or amenities to be created for balanced regional development.

To Citizen (Rural community)
Villages and services & amenities to be provided are being selected need based selected using this portal information; hence, people of the villages where there is a real need be benefitted. This leads to inclusive development and overall human development across the state.

Other Stakeholders

Other stakeholder like public representative's wants to develop their area inclusively and wants to provide services and facilities to people of their entire constituencies are also benefitted as they can now decides where and for what the resources to be used based on the Taluka Planning Atlas and village profile information.

Even Hon. Ministers and Secretaries in-charge of developing Talukas uses the Taluka Planning Atlas and Village Profile information for GAP analysis and thereby need based planning.

Implementation coverage
- Demographic spread (percentage of population covered):- Entire rural population of the state. (57% of Total Population)
- Application is accessible at different levels through authentication and authorization. Access has been given to
  - All Taluka Development Officers (250)
  - All District Statistical Officer (33)
  - All District Planning Officer (33)
  - All District Development Officer (33)
  - All District Collectors (33)
  - All Secretaries and Ministers of the State.

Services Delivered (some examples)
- Planning department of the State has issued guidelines to all districts mentioning that in 2016-17 the selection of works to be carried out under

decentralized district planning should be selected by Gap Analysis based on this portal data.

- As per the latest information available from district planning offices from various districts more than 2400 works covering sectors like Water Supply, Education, Health, Animal Husbandry, Village Roads, Sanitation and Others has been identified and approved based on the gap Analysis done through this portal and this is an ongoing process.

District Bharuch

- There are 92 primary schools in 59 villages of developing taluka, Valiya, out of which 12 didn't had compound wall; Rs. 30 lakh has been allocated for construction of compound wall in these schools.
- 10 villages (consisting 144 households) among 59 villages of developing taluka, Valiya didn't had electricity for which Rs. 35 lakh are allocated for providing electricity connections.
- It was found that, only 444 farmers are using drip/sprinkler method for irrigation. In order to encourage such method among other farmers, Rs. 28.82 lakh allotted to Gujarat Green Revolution Company Ltd.

District Tapi

- It was found that villages of Valod, Vyara, Dolvan and of developing talukas like Sonagdh, Uchchal, Nizar and Kukarmunda not having Approach Road; works are undertaken on priority basis in 2015-16.
- Village Nindvada of Songadhtaluka and village Nizar-5 of Nizartaluka : didn't had own building for Anganwadi ; work is sanctioned under DDP grant
- A work of construction of compound wall of primary school of Village Musa and Nibhora of Vyarataluka under DDP grant.

District Bhavnagar

- Underground Drainage works were sanctioned in villages of developing taluka, Ghogha.
- Taluka Development Officer of all other talukas has undertaken works for Underground Drainage based on list of villages generated from this portal.
- Pre - Summer works related to providing drinking water facility throughout the year is undertaken by Taluka Development Offers of all talukas based on information generated from this portal.

ENABLER INDICATORS
Process reengineering
To support the planning process an attempt was made by Directorate of Economics and Statistics through Village Amenities Survey, covering 69 items which was conducted bi-annually and static reports were generated in hard copy, the same were distributed need base. Due to time lag in collection, compilation and report generation reference to village amenity survey, it was difficult to provide updated information to planners/administrators. Moreover, the information was available in static tabular report so it was not user friendly to use this data.

Key Factors in the transition from earlier system

- Coverage increased from 69 items to 300+ items considering present day requirement and with reference to human development aspect.
- Latest technology used in development of the application.
- An integration of MIS data with GIS technology.
- Facility for regular updation of data.
- Online generation of user required maps and reports through dynamic query.
- Training through SATCOM/Video conference to all Village/Taluka/ District level functionaries for data entry, updation, generating reports/maps and for use of this application in general.
- The data entry module is in Gujarati- local language which made implementation easyat Taluka/District level.

Top three enablers for achieving results are as under:

Technology adaptations/ Innovative deployment

GIS technology are there and is generally used for remote sensing mapping and for estimating area under forest, water bodies etc. and using satellites maps. But in this application a simple use of this technology by integrating GIS maps (Taluka maps) with the availability status of various services/amenities at village level, helped the preparation of this very much useful information in an easily intelligible format. This helped a lot in its rollout as the planner/decision maker at District and Taluka level now uses this application for gap analysis and deciding where and for what the resources is need to be allocated.

Role of leadership by way of policy support/ direction

- Principal Secretary (Planning) guided and given directions from the conceptualisation to the rollout and implementation of this application.
- She presented and briefed the utility of this application to Hon. Chief Minister of the State, Hon. Planning Minister and also to the cabinet of the State and they encouraged the team for the project and asked all concern to use this portal as one of the tool for gap analysis and use it in decision making process specifically in decentralised district planning.
- She wrote to all Collectors and District Development Officers to use this portal for gap analysis and use this in their decision making process in allocating resources and selection of work more specifically in decentralised and district planning

Stakeholder's inclusiveness and participation

- Participation of stakeholders also played and an important role in success of implementation of this project.
- At root level Gram Panchayat and Taluka Panchayat are key stakeholders as data provider and they took the task of data collection and data entry enthusiastically.
- At district level the DSOs and DPOs worked as data verifier.
- District Collector and District Development Officers are using this portal for gap analysis and in decision making, more specifically for

decentralised planning with reference to where and for what the resources is to be allocated for balances development of the region.

- MLAs and other elected representatives are also encouraging and supporting the need based decision making being carried out using this portal.

Technology
- Front end : ASP.NET with C#, AJAX
- Back end: SQL server 2008 R2
- Networking: As this portal has been hosted at 'State Data Center (SDC)' and available on 'Gujarat State Wide Area Network (GSWAN)', so this component is taken care by IT department in general for the whole State.
- Work of S/W maintenance has been outsourced to 'Bhaskaracharya Institute for Space Applications and Geo-Informatics (BISAG)', the developer.
- 'Disaster Recovery' (DR) site is there for GSDC.
- Application has been audited by CERT in empanelled agency (certified by GoI) for security aspects.
- SATCOM facility of the BISAG is used for training and rollout of this application.

VALUE INDICATORS
Digital Inclusion
- Throughout the development process of the application/portal, regular consultation with the end user, developer and appropriate authority of the department was done through meetings, discussions, mail etc.
- The data entry module has been develop in Gujarati – i.e. local language, which benefited in data entry work by Village/ Taluka level manpower and also in roll-out of the portal.
- The entire system is working on graphical (map based) base, it makes easy for the stakeholders to carry out effective gap analysis locating the villages on the maps and the like.
- Accessibility (Time Window):- Software is hosted on the State Data Center of Gujarat and has the 24X7 accessibility in terms of time window.
- Presentation about the portal was made at various platform like in the Cabinet meeting of Hon. Ministers of the Government, in the meeting of Committee of Secretaries, in the meeting of District Collectors and District Development etc. CDs containing atlas of taluka have been provided to all stakeholders involved in the planning process at state, district and taluka level.
- The application has been developed using latest technology, it is sustainable and can be upgraded easily with less financial component.

Green e-Governance
- The system aims at working on paper less mode fosters the green e-Governance.
- Earlier map used to be prepared manually, hence when data updates again it required the process of manually preparing maps – this application provides generation of dynamic thematic maps online, no need of printing.

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HydCop

Hyderabad Police Commissionerate, Police Department,
Government of Telangana

M. Mahendar Reddy and K. Srinath Reddy

PROJECT OVERVIEW

Hyderabad COP is a mobile based application for the internal use of Hyderabad City Police. All the IT applications and databases currently in use in Hyderabad City Police have been made available to the officers in the field through this HYDCOP application on smart phones of all officers and staff of Hyderabad City. The officers on the field operations/jobs can capture the data from the crime scene/place of work, update the same into the various applications, analyze and process the data and obtain analytical reports online on their mobile phones. The HYDCOP, a mobile technology application will revolutionize the way Hyderabad City Police works and will enable and empower every frontline police officers right up to the constables in terms of input the data for every activity performed, accessing and analysing the centralized information that enables the faster decision making process through the use of mobile and IoT technology enhance the smarter methods of policing.. The use of the technology is expected to enhance the efficiency and effectiveness of every police officer deployed on the field. This will be a game changer for Hyderabad City Police in transforming themselves into smart cops and smart organisation enhancing the citizen's living standard and Public Safety & Security in Hyderabad City on par with any Global City.

The key objectives of the HYDCOP Mobile App are multi-fold to:

- Effective utilization of Information and Communication technology(ICT) traversing from e-governance to m-governance.
- Empowering and Delegating the frontline Police Officers for demonstrating quick & smart decision making
- Deliver Services "Anytime & Anywhere" for faster responsiveness to the Citizens
- Foster Information sharing & Knowledge exchange services to empower front line Police Officers
- Seamless integration of different application functionalities through Single-Sign-on services.
- Faster identification and tracking of suspects, quicker resolution of cases, and increased rate of convictions to the offenders
- Proactively prevent crimes through real time intelligence inputs and analysis relating to crime and criminals.
- To encourage transparency and accountability in every police officer witnessing the change of transformation.

RESULT INDICATORS

Improved Visible Policing:

By geo-tagging of approximately 4000 point books (Beat Points) of Hyderabad city, improves the Beats and Patrol management process with minimal manual interventions, improved monitoring by senior officers. Now, its mandatory to the

patrol officers to visit the assigned point books and to update the visiting remarks through GPS enabled mobile phones/tabs. All our Patrol Cars and Blue-colts (2-wheeler) vehicles are equipped with GPS devices, senior officers can monitor the movement of patrol vehicles, patrol routing, status of vehicle such as idle, moving, stopped etc. through mobile App remotely. All police station jurisdictions are geo-fenced, when the deviation in patrol routing, minimum patrolling hours than planned etc., is observed, an automatic alert will be sent to respective officers for corrective measures.

Improved surveillance over Criminals, leads crime prevention:
An alerts and information are received by the front-line police officers through Jail Release Management System (JMS) as and when any convict is released from Jail after serving the punishment terms. This information & alerts will help the front-line offices for an appropriate actions in-place to increase surveillance on the repeat offenders as part of crime prevention measures. All the Hyderabad based repeat offenders (around 3500 offenders) resident locations have been geo-tagged for periodical visits by the front-line police officers as part of crime prevention activity. The attendance of these offenders has been recorded automatically with their status update through the system, helps in providing their geo location and presence in the city.

Faster Emergency Response
By integrating the Dial -100 system with HYDCOP mobile application, it enables to monitor the Dial-100 emergency calls, response time and action taken on the incidents reported from the field. The response time to attend emergencies has been improved significantly through this system.

Behavioural change during the citizen contact
One of the important Third Eye Services in HYDCOP provide the front line officers to verify the antecedents' details of any suspect / citizen instantly from the database thus avoiding the traditional method of verification by taking the suspect / citizens to the police station.

Cycle time reduction in Investigation Process
HYDCOP is able to reduce the cycle time in investigation process, where the investigation officer's wants to know what are the towers and CCTV cameras near the crime scene by using Towers & Cams service in HYDCOP application.

Crime and Criminal Analysis
The multiple Apps within HYDCOP provides the crime incidents and criminal information, it has the ability to analyze the past history and present status about the offenders and suspects for making timely decisions to have better control on them and avert any major future incidents. To name a few critical Apps that are critical as part of the investigation and prosecution point of view to generate evidences:

- *Crime Mapping* – The crime incident has occurred any time, it is geo-mapped with the coordinates about the date/time, place, type and modus operandi (MO) details on the map. This provides the past history of crime incidents area/MO/type wise information for analysis purpose.

- *Towers & Cams* – This App provides the ability to trace the mobile conversations by the offender / suspect and extend the connection points with others to establish the network links that helps in resolution. Any video surveillance cameras at the crime area or nearby places will help to establish the evidences
- *Look-out Notices* – This information will be helpful to understand any notices issued on the offender / suspect to ease out the investigation process.
- *CDAT* – This App provides the Offenders and their contacts with family, friends, or acquaintances through mobile phone numbers to establish the relationship tree. In combination with cell tower data, it provides to establish the transactions/events occurred during any event/incident.

Key Performance
Services that are currently being delivered

- Incident Management – to report an incident
- 3rd Eye– antecedent verification services
- Patrol Management – Beats & Patrol Management
- Crime Mapping – Area wise crime history
- Collaboration – Vehicle, People, SOS and stakeholders information
- Jail Release Management – Real time Jail releases information
- MO Offenders Checking – MO offenders listing and checking management
- Towers & Cams – Area wise cell phone towers & CCTV information
- Look-out Notices – Lookout notices on wanted, Missing and unknown dead bodies
- Process Standardization – Head wise SOPs and Checklists
- Community Policing – Community integration programs
- Dial-100 – Emergency Response System
- CDAT – Offenders Professional and family tree based on phone number
- Pay Slip – Individuals pay particulars
- Service Book – Individuals Service register
- DPR – Daily Progress Report (Time Sheets)
- Leave Management – Leave applications and approvals

Benefits obtained from these services
Front-line Police Officers: Single sign-on, Real time intelligence, service delivery on "Anytime & Anywhere" basis, Real time alerts on incidents and emergencies, faster identification and tracking of suspects, quicker resolving of cases and enhanced convictions to the offenders.
Senior Officers: Higher visibility with past history, improved monitoring on field team operations alerts on incidents and emergencies, escalations on poor performers and quicker decision making.
Citizens: Improved crime prevention, faster emergency responses, cycle time reduction in investigation process, behavioral change in field officer and safe & secure community.

Table: Year-wise wise transaction volumes for various services

Service Name	Transaction Count	Service Name	Transaction Count
Dail100	58028	Evidence	44
3rd Eye	126216	Incidence	235
CDAT	1019	JRMS	7317
CCTV	4656	MO Offenders	77987
Collaboration	17855	Patrol Management	134973
Community Policing	9	PaySlip	4114
Crime Mapping	4466	Towers	18680
Crime Scene Management	3128		
		Total Transactions	**458727**

Implementation coverage

Around 5000 users of different roles such as Patrol Car Officers, Blue-Colts Officers, Station House Officers, Investigation Officers and Senior Officer in Hyderabad Police Commisssionerate are using this application. Important services have been extended in IOS for senior officer's usage.

We are planning to cover all 15,000 staff of Hyderabad Police Commisssionerate and to replicate the same for entire Telangana State in the name of TSCOPS.

New Services/Scope Enhancementsand Integrations with existing Apps:

- CCTV- Live Stream
- Passport Verify App
- Hawkeye Emergencies
- Video Conferencing
- Investigation Support Centre
- CCTNS Enterprise Search
- Daily Situation Report
- Court Disposals
- Grave Crime Report
- FIR/Petition Status
- Case Progress Sheet
- Court Calendar
- Court Case Dairy
- Process Duty (Summons & warrants serving)

Outcomes in terms of Efficiency, Improvements and integration

- Effective utilization of Information technology (Journey from e-governance to m-governance)
- Empowering the frontline Police Officers
- Deliver Services "Anytime & Anywhere"
- Internal Information sharing & Knowledge exchange services to empower front line Police Officers
- Consolidation of different application functionalities in to Single-Sign-on service
- Faster identification and tracking of suspects, quicker resolving of cases and enhanced convictions to the offenders

- Proactively prevent crimes through real time intelligence inputs relating to crime and criminals.
- To bring in transparency and accountability in every police officer.

HYDCOP already integrated with RTA and UIDAI and NIC databases. Further planned to integrate with CCTNS (Crime and Criminal Tracking & Network Systems).

ENABLER INDICATORS
Process reengineering
- All the systems have brought under state-owned data center with DRS implemented to have a better control on the security aspects and protection of IP, and Data.
- As part of the Data Center operations, standard processes and procedures have been defined.
- Change management process has been established in the areas of user management; data management and source management
- ICT components have been acquired to support the testing and deploying of these applications on handheld and smart devices
- Handheld and smart devices provided to the field staff, senior staff and support staff to provide information at their door-steps

Challenges faced in implementing Process changes
- Adopting the smart devices based applications and technology by the field and senior staff through rigorous training.
- Transforming from paper based to device based information access
- Analytical approach for effective and efficient use of information provided by the multiple systems for optimal results
- Basic logical and analytical concepts to understand its simplicity in getting bigger results

The Lessons learnt from the Process re-engineering
- Change management was a challenge and time consuming, it should have been provisioned in the plan
- Awareness and training sessions to staff should have planned based on the level of understanding on the technology, aptitude and receptive capabilities
- Some sessions of user interfaces of applications/modules should be envisioned based on the end user aptitude for certain levels
- Needs the measurement metrics to measure the return on investment (ROI)
- Due to technology and visibility, there is a need to define roles and responsibilities in changed scenario

Best practices adopted
- Some of the Apps implemented in developed countries particularly by law enforcement agencies have been considered

- The App was developed based on basic fundamentals that "I know my job better and I know what I need"; "Convert what I am doing now into a smarter way of doing by using the technology as a tool"

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
Head of the institute is the project sponsor with commitment, determination and end-goal in mind.

Change management and Capacity building strategy
- Due to the leadership commitment and project sponsored, the capacity planning was smooth where identified the first lot of staff based on the job knowledge, technical and analytical abilities to make the initial launch as a success story to build use cases for cascading into the organization
- While implementing the application phase-wise, change management process is being evolved to address the challenges for corrective measures with the help of project sponsor.

Project management
The following are some of the key factors in successful implementation of the system as:
- Providing smart devices such as tablets, ipads, smart phones etc., with broadband connectivity to every field officer and senior officers for the access of Application online anywhere & anytime
- Training on usage of smart devices with basic technical features and HYDCOP mobile app features and role based processes covered for set of officers
- Foster change and reorientation to transition from manual system to online system.
- Table top exercises and on-job orientation for effective usage of the system
- Soft skills training for easy adoption of the technology based processes and its benefits while dealing with the citizens
- Quick responsive time to attend the incidents, faster communication with facts on-field, sharing of information etc., resulted in resolution
- Assimilation of technology based work culture has provided to be proactive and responsive to serve the citizens

Financial model adopted: Self-financed initiative

Special efforts to ensure sustainability of the e-Governance initiative(s)and Challenges faced in transition
The uniqueness of this application for sustainability is that the amount of information provided by the App to the field staff is enormous on their devices. As we progressed on the project, the adoptability has become relatively easy to expand for their own sustainability.

The Lessons learnt from Change Management and Capacity building

The Senior Management is needed pay attention to remove perceptions that the staff may not feel sufficiently valued or not fully engage and they are not responsible or accountable for success. There is a need for clarity in relation to such matters as:

- Roles and responsibilities each Stakeholder
- Key shared objectives;
- KPIs, reporting and monitoring; governance;
- Management (including dedicated project).
- Sharing experiences to build trust, cooperation and higher levels of communication.
- Expanding leadership competencies throughout the organization and identifying the characteristics that are most motivating to each individual

Technology

Technology Stack

- Development Platform: .Net framework
- Web Server: IIS
- Database: MSSQL
- Mobile App: Android and iOS

Technology related challenges faced

Integrations with third party application were an important challange.

The Lessons learnt from Technology choices and implementation strategy

Yet to visualize its limitations and constraints, it needs some gestation period other than what is defined above.

VALUE INDICATORS

Green e-Governance

Implementation of this App has provided the following:

- Significant reduction in paper usage: Moving towards paper-less state thereby eliminating the waste
- Significant reduction in carbon footprints:
    - Significant reduction in local travel by the field and senior staff from field to police stations or HQ to access the records, information, discussions and meetings with the use of this App and Video conferencing facility
    - Minimized / eliminated to bring the offender/suspect from the crime spot to the police stations or HQ to check their antecedents.
    - Save on natural resources such as fuel, vehicle maintenance costs etc.
- Improved productivity and efficiency

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Performance Measurement System
State Crime Records Bureau, Government of Rajasthan

Kapil Garg and Pankaj Choudhary

PROJECT OVERVIEW

Performance measurement is an essential exercise in any organization for evaluation of standards of service delivery and identification of techniques of improvement. Almost all processes of measuring performance require use of statistical models to determine results. Various police units have experimented with different models of performance measurements in their endeavor to make the exercise as objective as possible. An absence of standard performance indicators of police functioning however makes the task of performance evaluation extremely difficult.

It is a common complaint of police personnel that performance assessment is not carried out in a fair manner. In order to remove subjectivity from performance measurement to the extent possible, it was decided to identify certain parameters under which the outputs are quantifiable and which are common to all units being assessed in terms of their duties. In order to devise a system for objective performance appraisal of the work of Police Stations, they being at the cutting edge level of police service delivery, 14 parameters were identified for evaluation and a scoring matrix were adopted. The parameters broadly cover the following aspects of policing:

- Crime prevention and proactive measures
- Action against anti-social elements
- Disposal of cases
- Detection work
- Back-end work
- Community policing
- Maintenance of Law & Order

A scoring matrix has been created with positive marks for specific performance and negative marks for under-performance in certain parameters. The prevailing scoring matrix is placed at Annexure-A. Points scored under parameters affected by the size of the Police Station are first normalized with Indian Penal Code (IPC) registration of the previous year, before adding points scored under other parameters, to generate a monthly score of the Police Station. A district and state level merit list is prepared based on the monthly scores of all Police Stations. Separate merit listsare generated for Government Railway Police Stations (GRPs) and Mahila Police Stations, while special Police Stations like Special Operations Group (SOG), Cyber Crime Police Station, Tourist Police Station, and Metro Police Station are not included in the system. State Crime Records Bureau (SCRB), Rajasthan has developed a web-based Performance Measurement System for Police Stations on the existing web-portal of Rajasthan Police for effective monitoring by senior officers on the basis of identified parameters for performance evaluation.

RESULT INDICATORS

The key benefits of the system are summarized as under:

- Evaluation parameters declared in advance
- Target based and focused approach
- Transparent system of evaluation
- No scope of favoritism
- Constant motivation to improve
- Healthy competition
- Priorities remain in focus continuously
- Flexible marking pattern in accordance with priorities

Key Performance

Services that are currently being delivered using ICT

- Though there is no service as such being delivered under the project, but there are many indirect benefits to the supervising officers as well as the citizens. The main benefit is the monitoring of all the tasks being performed at the lowest unit of field establishments as well as performance of their concerned supervisory officers.

Benefits obtained from these services

- There is an effective and transparent monitoring of the field establishments by the Supervisory officers and at the level of political executive. The media also keeps a close watch on the rankings and publishes the same occasionally. Citizens benefit in many ways as a result of timely disposal of cases, service of warrants/ summons, action against anti-social elements, better detection and improvement in public order. A closer bond between police & citizen is also established.

Implementation coverage

- Performance measurement of all Police Stations across the State of Rajasthan is being done till date.
- A project for further development of the system on CCTNS database is envisaged.

Outcomes in terms of Efficiency, Improvements and integration

Pendency percentage of cases decreased in state

- Pendency percentage of cases decreased in state. In July 2015the percentage of pending cases was more than 24% while in July 2016 the percentage of pending cases is less than 21%.

Higher levels of Preventive action

- Execution of warrants has increased. Reduction in time for verification process for issuance of Passports/ Arms' License, Tenants, Servants etc. Disposal time decreased in the cases related to women and weaker sections.

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems

- The system has been integrated with most of the transactional data received through police portal. This will be further integrated with the CCTNS application in future, when the same is implemented.

ENABLER INDICATORS

Process reengineering

- Some data is transactional from FIRs, arrests of Standing Warrantees, Proclaimed Offences and History Sheeters, etc. while some data is non-transactional and is entered on monthly basis by a certain date.
- The performance is measured by normalizing the marks on the basis of number of IPC Cases registered during the previous year, so that the quantum of work/ opportunities at a Police Station does not affect the evaluation.
- The marking criteria are reviewed from time to time so that there can be quality and rational improvement in measurement of performance.

Challenges faced in implementing Process changes

- There are two kinds of data entered in the Performance Measurement System; one transactional like FIR, Standing Warrantees, History Sheeters, Proclaimed Offenders etc. and the another non-transactional. There is a risk of non-transactional data being fudged.
- A system of close supervision by supervisory officers and penalty for false entries has been put in place. The In-charge of the Police Station is also held liable for such entries.

The Lessons learnt from the Process re-engineering exercise

- The successful implementation of a rational and transparent system of measuring the performance of Police Stations, encouraged its extension to higher offices, with some changes in the marking criteria and devising a process for measurement of performance of supervisory officers.

Best practices adopted from the industry/ other State implementations

- The system is unique in the country and other states have been asked to follow the system by the Ministry of Home Affairs, Government of India.

Leadership, Change Management, Capacity Building during transition

Leadership support for the initiative

- The system is closely monitored at the level of Director General of Police and the highest levels of political executive in the State. The system has been greatly appreciated by the hon'ble Home Minister of Rajasthan and the hon'ble Union Home Minister.

Change management and Capacity building strategy

- Initial trainings were conducted for police personnel. The initial reluctance at the field level was overcome through perseverance.

Project management & Monitoring

- Reports are generated every month giving ranks to the Police Stations at the District as well as the State level. The reports are visible to all, i.e. any PS can view the ranks and marks of any other PS. The false entries are further monitored by the officers on monthly basis by matching the data with the ground reality.

Financial model adopted

- The project was a part of a slew of IT initiatives costing a total of Rs.18 Lacs. The entire funding was borne by Govt. of Rajasthan.

Special efforts to ensure sustainability of the e-Governance initiative(s)

- The project is being maintained in-house at present. The system is closely monitored by political executive and the departmental hierarchy. Occasionally, the Media also acts as a watch dog.

Challenges faced in transition

- There was not much problem of capacity building as the police personnel were already entering data at the Police Station level in FIRs and other modules of Police Portal. Some extra modules for monthly entry of data were developed and explained.

The Lessons learnt from Change Management and Capacity building

- It was learnt that there may be possibility of some false entries. It was taken care by strong monitoring and a system of negative marking for false entries.

Technology

Technological solution adopted

The system is built on .Net framework and backend database id MS SQL. The system was developed from resources hired from a company and the development was done onsite at State Crime Records Bureau (SCRB).

Compliance of the Technology adopted with e-Government standards

The e-Governance Standards are taken care while developing the application.

Technology related challenges faced

Crime and Criminal Tracking Network and Systems (CCTNS) masters are not used fully. Problem is anticipated in making the system functional using CCTNS data, when CCTNS is implemented in Rajasthan.

The Lessons learnt from Technology choices and implementation strategy

The system has to be re-built once the CCTNS Project is launched as it has to be integrated with CCTNS.

VALUE INDICATORS

Digital Inclusion

- As the stakeholders are police personnel working in the field establishments and the system has been implemented for monitoring by all senior officers, there are no such barriers in the system.

Green e-Governance

- The project has resulted in Green e-Governance as there is no need to call manual data and reports. Supervisory officers can see the performance of the Police Stations and field establishments on their desktops. The unnecessary movement of staff for delivery of Dak is also avoided as all the reports are online.

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Court Case Management System
Central Electricity Regulatory Commission (CERC), New Delhi

Shubha Sarma and Vaishali Rana

PROJECT OVERVIEW
The Electricity Act, 2003 created the Central Electricity Regulatory Commission (CERC) for a vast multitude of functions including adjudicatory powers. Accordingly, CERC performs the role of a quasi-judicial authority as per the Code of Civil Procedure and adjudicates upon disputes covered by the Electricity Act which are brought before CERC in the form of petitions. Like any judicial authority, over the years, the number of petitions filed before CERC has been increasing. In order to achieve the objectives of speedy disposal, transparency, introducing economy and efficiency and following the principles of natural justice, CERC launched the E-Court initiative also named as Court Case Automation Management System (CCMAS).

Table: Project Objectives & Intended Benefits

Sl. No.	Objective	Benefit
1	To enhance the availability of petitions to all the concerned stakeholders	Increases transparency, reduces time and cost
2	To reduce the no. of hard copies submitted by petitioners and respondents	Reduce time and cost
3	To receive the objections/comments by Consumer, Consumer Organizations online	Reduce time and cost
4	To send communication regarding notices, ROPs, Orders etc to the parties online	Reduces time, cost and ensures service
5	To facilitate quick and easy access of the relevant documents to the Commission	Reduces time and increases efficiency
6	Conducting hearing with the soft copies of petitions, replies, rejoinders, comments, objections and written submissions filed by various stakeholders	Reduces time and cost, easy access, retrieval and storage of information

Project Value Proposition
Keeping with the dream of Digital India Central Electricity Regulatory Commission (CERC) has launched an e-filing application to develop an integrated, flexible and dynamic database for filing of petitions and other documents online. Through the e-filing application, users can file their petitions/replies/rejoinders/other documents online and can track/view the status of their petitions. It offers quick and easy access to CERC's legal system and is a part of the organisation's on-going efforts to increase transparency. With features such as SMS intimations, online service of notices, online communication of record of proceedings, orders etc, the e-filing system will transform the manner in which the legal system in CERC functions.

Project Achievements
The petitions are being filed online using the application since 4 April 2016 and achieved the objectives.
- Encouraged users to register online
- Encouraged filing of digitized petitions by users

- Encouraging CERC employees to online scrutinize the filed petitions
- Making the relevant information/documents/notices available to all the participating litigants through SMS/e-mails
- Hearing in e-Court setup with the digitized petitions access, replies, rejoinders, comments, objections and written submissions filed by various stakeholders
- Provision for creating notes by Hon'ble members on the digitized petition files during hearing in the Court in non-sharing mode
- Making the status of petition, Orders/ROPs available on net
- Making review of petitions in easy and efficient manner through CCMAS – MIS Application developed for in-house work flow of petitions

Two key leanings from the life cycle management of the project deployed:
- Robust structure of e-Filing services has been created after repeated consultations and discussions with stakeholders. Due to the sensitive nature of information, any gaps would have caused severe problems. Hence for 6 months, the services were kept in trial mode where the users were asked to work on it and give their feedback. Only after its use was smooth and hassle free was the system made live in April 2016.
- Sustaining top management support for implementation and standardization of data and processes and don't let the third party solely plan for a method and the implementation of the project.

RESULT INDICATORS
Key Performance

Table: ICT services

Sl. No.	Services	Deliverables
1.	e-Filing	Enable filing of petitions in soft copy after registration on the CCMAS portal
2.	e-Pleading	Enable filing of reply, rejoinder, comments etc online
3.	e-Library	Digitization of records and enable viewing softcopy of petitions, replies, rejoinders, comments, objections, written submissions etc using search facility
4.	Case Information System	Enables processing the petition at various stages in CERC, Case Data maintenance and Cause list Generation.

Benefits obtained from these services by each category of stakeholders:
- Reduced the lead time between filing petitions and listing them for hearing. In the past, when petitions were filed manually, there were several errors. Also given the huge workload, often the gap between filing of a petition and listing it for hearing was quite large. With this system, hearing is held within a few weeks of filing of the petition hereby expediting the entire judicial process.

- The e-filing system provides services such as SMS intimations, online service of notices, online communication of record of proceedings, orders etc. e-Filing services has helped the parties save time, manpower and money.
- Led to greater transparency as the stakeholders are now aware of the EXACT status of the petition and reasons for pendency if any. Greater accountability is achieved as there is time stamping on documents. All this has also increased efficiency of the Commission's officers and done away with discretion and arbitrariness.
- There is better internal monitoring and increased accountability as Case Information System (CIS) has improved substantially. Exact nature of pending petitions, reasons for pendency, date of last hearing etc are key parameters on which internal review and monitoring is done and to allows us to improve our performance. Ever since the trial run of the project, in October 2015, the disposal rate has increased up to 500%. This has enhanced the credibility of the regulatory system and has restored the faith of stakeholders.

Year-wise transaction volumes for various services:

Table: Stakeholders Registration Summary (as on 19th September 2016)

User Type	No. of Users Registered
Organizations	139
Advocates	47
Employees of already registered organizations	82
Individuals	4
TOTAL	272

Table: e-Filing & e-Pleading Summary (4th April – 19th September '16)

Description	Number
Number of Petitions e-Filed	200
Number of Reply, Rejoinders, Additional Information, Written Submission Filed by Petitioners/Respondents through e-Pleading interface	968
CERC ROP/Orders and other correspondence sent through e-Pleading interface	619
Total Transactions through e-Mode	1787

Implementation coverage
Geographical Coverage
It is a web based solution and available all across the world.
Stakeholders Coverage
- Central Electricity Authority, Central Generating Companies, Central Transmission Utility (CTU), Consumer Associations, Distribution Licenses, Independent Power Producers, Individual Consumers, Interstate Trading Licenses, Interstate Transmission Licenses, Intrastate Transmission

Licenses, Ministry of Power, MNRE, National Load Dispatch Centre(NLDC), Non Govt. Organisations (NGO), Other Generating Companies, Power Exchanges, Regional Load Dispatch Centres (RLDC), Regional Power Committees, State Electricity Boards, State Govt./Union Territories, State Load Dispatch Centre, State Regulatory Commissions, State Transmission Utilities (STU).

Outcomes in terms of Efficiency, Improvements and integration

Nominee should present here the specific outcomes from the services being delivered/ process changes made/ technology interventions done leading to benefits to stake holders.

Time and cost efficiency improvements:

Reducing the lead time between filing petitions and listing them for hearing. In the past, when petitions were filed manually, there were several errors. Also given the huge workload, often the gap between filing of a petition and listing it for hearing was quite large. With this system, hearing is held within a few weeks of filing of the petition hereby expediting the entire judicial process.

- Strengthened MIS & Improved internal monitoring due to which Legal division may concentrate on their core activity.
- The e-filing system provides services such as SMS intimations, online service of notices, online communication of record of proceedings, orders etc. hereby save time, manpower and money.
- Adopting cloud computing and deploying the application on NIC Cloud platform hence reducing the Capital expenditure to Operational Expenditure
- Use of internal resources and doing software development on all open source software makes the project very cost effective
- In addition to above it will save the daily use of papers/ postage charges on account of speed post.

Specific innovative ideas implemented in e-Gov area and their impact on services:

- Sharing online video tutorials and Use of all open source software
- The model's strength is its simplicity and robustness. Every step has been thought through and incorporated to reflect the actual process which is fairly common across judicial or quasi-judicial authorities. Hence, it can be simply taken and implemented with minor customization in any similar organization.
- The CCMAS project is developed in 3-tier architecture with struts 2 framework; Spring IOC is used for security and service layer and hibernates as an ORM.

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems:

- Fully integrated with other applications like Document Management System, CERC Intranet running in the Commission which contains the softcopy of petitions and data filed before the Commission before the launch of e-Filing application.

ENABLER INDICATORS

Process reengineering

- Preliminary Scrutiny Checklist for registration of the petitions has been standardized.
- Standardization of ROP/Orders/Factsheet/Hearing Notice format.
- Standardization of many petitions monitoring reports format.
- Petition Registration Procedure with time limits have been defined

Challenges faced in implementing Process changes

- End users resistance to change both from external and internal stakeholders
- Freezing the user requirements and creating a common platform that addresses all concerns. Due to multiple users (companies, Government agencies, lawyers, CERC) the problem was highly complex
- Data preparedness and data migration
- Complicated work flows and multiple channels of movement of information.
- Training to stakeholders/users

The Lessons learnt from the Process re-engineering exercise

- Implementing the solution in a modulated fashion
- Flexibility and including employees from all level- Operational, Middle Management, High Management
- Adopting Practical approach and Sound System Planning

Best practices adopted from the industry/ other State implementations

- Extensive stakeholder participation. Workshops were held at regular intervals and also when critical milestones were achieved at the time of developing CCMAS. For e.g., stakeholder interaction was held and feedback was obtained before initiating the project, after layout and screen design, after development of application and before launch of trial run.
- Innovative Design and layout of the application. Users can access it 24 x 7 from multiple locations. In addition, innovative practices such as sharing online tutorials on the application and having a dedicated helpline to address user concerns were used.
- Adopting cloud computing and deploying the application on NIC Cloud platform making it highly reliable with near zero downtime and zero data loss. Users can access it from multiple locations and 24 x 7.

Leadership, Change Management, Capacity Building

Leadership support for the initiative

- Full support from top management for the initiative. Business Process Reengineering (BPR) was undertaken and workflows were streamlined and simplified. Public Notice/Instructions and necessary intervention was done by top management as and when required for the smooth and successful implementation of the initiative.

Change management and Capacity building strategy

- The success of CCMAS was dependent on handling change management and capacity building. Several strategies were used such as highlighting the advantage of the application, making it simple to use, inviting stakeholders for repeated rounds of discussions in small groups and larger workshops, changing the model in line with their suggestions, etc. Most importantly, stakeholders were convinced that CCMAS will reduce their costs, time and make their interaction/interface with CERC easier. Similarly, internal stakeholders were persuaded that this would reduce manual drudgery and the Business Process Reengineering (BPR) would benefit all concerned. Innovative practices such as sharing online tutorials, FAQ, instructions to use the services and having a dedicated help desk counter at CERC premises was established.

Project management & Monitoring

- Project management and monitoring strategy includes gap Analysis and Identification of needs, Overseeing the training of staff, Overseeing the documentation of the system, Managing the associated risk and quality issues. Continuous evaluation and taking feedback from the stakeholders so as to improve the features and usability of the application day by day.

Financial model adopted

Self –financed initiative by Central Electricity Regulatory Commission
Total Cost of Ownership:

One Time (In Rs.)

- Hardware, System Software, Networking   50.4 Lakhs
- Application Development   41.0 Lakhs
- Total Cost   91.4 Lakhs

Recurring Cost (In Rs) p.a.

- Cloud Virtual Machine (VM)   05.5 Lakhs p.a.
- Production Support & Maintenance Cost   28.0 Lakhs p.a.
- Recurring Cost   33.5 Lakhs p.a.

Special efforts to ensure sustainability of the e-Governance initiative(s)

For spreading the awareness about the CERC digital India initiative wide publicity through newspaper advertisements was done, public notice on CERC website was uploaded. Meetings with the stakeholders were conducted at regular interval of time. Moreover telephonically stakeholders were contacted to register them and Innovative practices such as sharing online tutorials, FAQ, instructions to use the services and having a dedicated help desk counter at CERC premises was established. A common feedback email id was shared with the users for their queries and suggestions. Apart from that feedback was also taken by top official during their meetings with stakeholders.

Challenges faced in transition

- Getting the respondents registered and making e-Filing of petitions mandatory.

- Convincing the advocates that the application will bring more transparency and efficiency.
- Availability of outstation stakeholders for training.

The Lessons learnt from Change Management and Capacity building
- Involve Stakeholders at all level of application
- Conducting regular workshop training sessions for the end users/ stakeholders
- Spreading awareness about the application and its benefit
- Making the e-filing mandatory step by step keeping the stakeholders in confidence

Technology
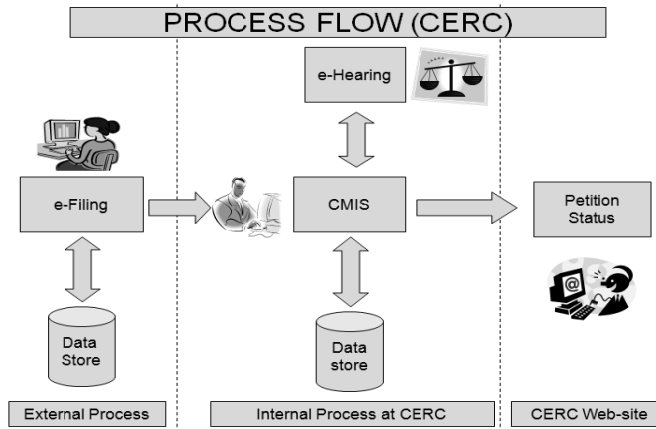
Figure: Process Flow

Application Design - The application is developed in 3-tier architecture with struts framework, Spring IOC will be used for security and service layer and hibernate as an ORM.
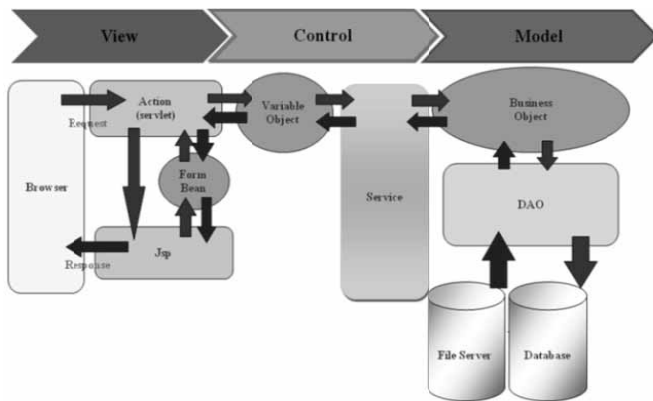
Figure: Application Design

Maintenance Model–Three level maintenance matrix for Court Case Management Automation System
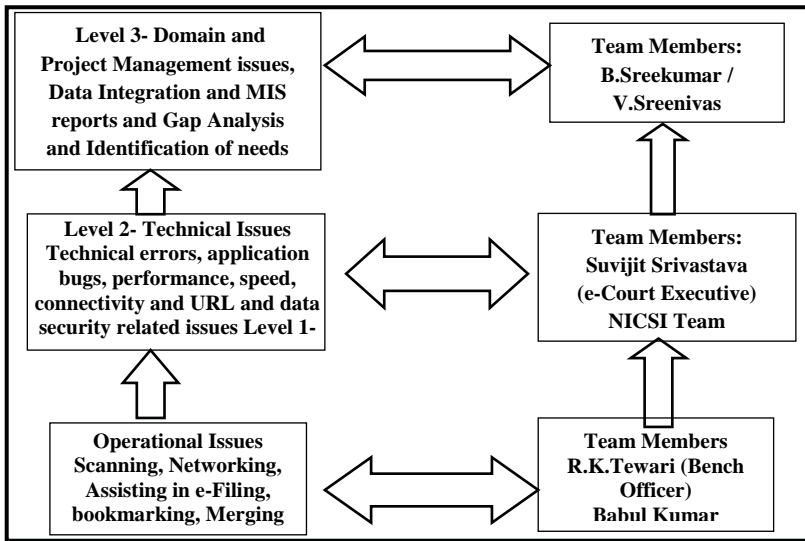
Figure: Maintenance Model

Compliance of the Technology adopted with e-Government standards
- Full compliance with e-Governance standards and the Security Audit of the application was done by Cyber Security Division NIC. The application was deployed and made live only after getting NIC Security Audit certificate.

Strategy for Disaster Recovery and service continuity
- The main goal of CCMAS backup and disaster recovery policy is to ensure continuity of the backup, data integrity and data availability. This will secure the data in case of a disaster and the productive hours of CERC and other stakeholders will not be affected and therefore NIC Cloud Backup policy is adopted in which complete and incremental data is backed up under NIC cloud services at regular intervals and stored in tapes which are kept at various geographical locations.
- Production servers at DC (Data Center) site (NIC Cloud) and DR (Data Recovery) site (CERC premises) are synchronized. Scripts are scheduled to execute the replication of data at end of day.
- In case of a disaster or any inconsistency the system would be restored from the DR site located at CERC using backup available at local servers on this site or the backup available on tapes of the NIC

Impact and value-addition thru adaption of Social media
- Being the Electricity regulator and quasi judicial role not much emphasis was given to Social media platforms, however wide publicity through newspaper advertisements was done, public notice on CERC website was uploaded. Meetings with the stakeholders were conducted at regular interval of time. Moreover telephonically stakeholders were contacted to register them and for spreading the awareness about the CERC digital India initiative. Thousands of

letters were sent to stakeholders to get them registered on the CERC e-Filing portal.

Technology related challenges
Integration of CERC network with NIC network and with NIC Cloud.

The Lessons learnt from Technology choices and implementation strategy
- Flexible design to ensure that the project can be customised and with minimum UI changes and can be implemented in other organizations with similar activities.
- Database, application and file storage to be kept distributed over network to minimize the data loss and capacity/ability to cater to large data volumes at rapid speeds.
- Building the application using open source software and deploying it on cloud platform to develop low cost applications and eliminate risk.

VALUE INDICATORS
Digital Inclusion
- Extensive stakeholder participation. Workshops were held at regular intervals and also when critical milestones were achieved at the time of developing CCMAS. For e.g., stakeholder interaction was held and feedback was obtained before initiating the project, after layout and screen design, after development of application and before launch of trial run.
- Innovative practices such as sharing online tutorials, FAQ, instructions to use the services and having a dedicated help desk counter at CERC premises was established.
- Wide publicity through newspaper advertisements was done, public notice on CERC website was uploaded. Moreover telephonically stakeholders were contacted to register them and for spreading the awareness about the CERC digital India initiative.

Green e-Governance
- CERC e-Filing services are deployed on NIC Cloud platform and Blade Servers were procured which consumes very less electricity.
- All live petitions as on 5.1.2015 were digitized and uploaded in Document Management System (More than 600 Petitions),Approximate number of pages digitized for live petitions were 2, 37,600 from Jan-Sep, 2015 resulted in huge paper and photocopy savings.
- Weeding off of App 600 disposed of petitions and 1787 number of e-Transactions ends up in huge paper savings and hence cutting of trees moreover storing space for large number of records is also solved.

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AAPURTI-Uttar Pradesh Public Distribution System under National Food Security

Commissioner, Food and Civil supplies Department, Uttar Pradesh

Ajay Chauhan and Saurabh Gupta

PROJECT OVERVIEW

Uttar Pradesh, the largest state in India in terms of population, is host to the largest network of Public Distribution System (PDS) with more than 3.31 croreration cardholder and14.57 crore beneficiaries. Computerization of Public Distribution System as per National Food Security Act (NFSA) has been introduced all over the State under the name "AAPURTI-UP" with the objectives of providing food grains and other essential items to vulnerable sections of the society at subsidized prices. "AAPURTI-UP" has been implemented to enable transparency in the matter of allocation and distribution of essential commodities as per NFSA norms. The new PDS under NFSA is seen to have evolved as a major instrument of poverty eradication programme with the objective to serve as a safety net of the poor. The objectives of this project are as follow:

- Ensure access to adequate quantity of quality food at affordable prices as per NFSA norms.
- Create transparency at every stage in the entire Public distribution system for effective implementation of NFSA.
- To help the government in effective monitoring of implementation of PDS scheme under NFSA.
- To identify and detect duplicate beneficiaries or bogus beneficiaries in official records and prepare genuine list of beneficiaries as per NFSA.
- To track leakage and pilferage of food items meant for PDS so that NFSA may be implemented effectively.
- To strengthen the supply chain management of PDS network and ensure timely tracking of movement of food grains from the central go down to the fair price shops.
- To improve the efficiency and effectiveness of operations and services of the department, usher in transparency, strengthen PDS and ensure better delivery to the public.
- To provide fast and accurate information to the Govt. for strategic decisions to be made for effective implementation of NFSA.

RESULT INDICATORS

Key Performance

- 40,95,357 Antyoday Ration Cards (having 1,64,20,218beneficiaries) have been digitized under NFSA.
- 2,90,57,136 Priority Household Ration Cards (having 12,93,65,835 beneficiaries) have been digitized under NFSA.
- Total 3,31,52,493 NFSA Ration Cards (having 14,57,86,053NFSA beneficiaries) have been digitized.
- 76.19 lakh applications for new Priority Household Ration Card have been received through CSCs

- 65,159complaints have been received through call centre application out of which 59,607have been resolved and disposed.
- 77,837Fair Price Shops are covered.

G2G Services:
- Ration Card details are being provided by Web Services for identification of beneficiaries for National Health Insurance Scheme.
- Government Hospitals are provided online verification of beneficiary to provide free / subsidized medical treatment.

G2C Services:
Ration Management
- Online application for new ration card, ration card modification, renewal and surrender through CSCs.
- Digital Signed Ration card issuance to beneficiary.
- Exhaustive search to view details of NFSA Ration Card on the web portal.

Supply Chain Management
- Reports of Allocation and commodity lifting by FPS are available on the web portal for public viewing
- e-Challan can be viewed by public which contains information regarding quantity allotted to FPS, current rate of commodities, deductions and net cost of the allotted quantity.
- SMS alerts are being sent to registered individuals regarding lifting of commodities by FPS which makes the beneficiaries well aware of the stocks available with FPS.

E-Procurement
- Farmers can register online for selling food grains to the department.
- Farmers can view block and village wise list of procurement centres to find centres in their locality.
- When purchase is done from the farmers at procurement centre then all details are recorded online and purchase receipt is provided to the farmers within no time.
- Bank account information of farmers is recorded along with purchase details. RTGS payment receipt is generated online and submitted to bank same day so that farmers receive payment in their bank account without any delay.
- SMS alerts are generated for the farmers at the time of purchase.

PoS with UID Integration
- Ration delivered to genuine beneficiaries using Adhaar based authentication through PoS devices.
- In case of beneficiary's Adhaar not available, ration is delivered after authentication of One Time Password sent on the registered mobile no of the beneficiary.
- Poor Beneficiaries can lift the commodities in instalments through PoS based transactions in case of non-availability of total amount.
- As soon as ration is issued to the beneficiary SMS alert is sent to the registered mobile no of the beneficiary.

Mobile App
- Facility to search Ration card details by giving basic inputs like location, name, and Adhaar/mobile no etc.
- Search Name, Address and Mobile No. of Fair Price Shop linked with the beneficiary's ration card
- Information regarding eligibility criteria for NFSA beneficiary, news, weather etc.
- User can get prompt information when allocation is done at FPS.

Grievance Redressal
- Facility for registration of grievances and viewing complaint status by citizens through call centre or directly through web portal.
- Citizens can view current/final status of complaint through the web portal.
- SMS alerts are sent to complainant at the time of complaint registration and resolution.

Implementation coverage
*Geographical Coverage:*Entire Uttar Pradesh
Demographic spread (percentage of population covered)
- In Rural areas: 11,85,53,294individuals are covered out of 15,57,30,048 population (76.12%)
- In Urban Areas: 2,72,32,759individuals are covered out of 4,40,63,765 population (61.80%)
- Total14,57,86,053 individuals are covered out of 19,97,93,813 population (72.96%)

No. of delivery centres:-
- 75 district level offices
- 315 tehsil offices
- 831 block offices in the rural area
- 658 rationing area offices in the urban area
- 77,837 FPS
- More than 36,000 CSCs across the state

In total, there are more than 1.15 lakh delivery centers available across the state.

Outcomes in terms of Efficiency, Improvements and integration
The innovativeness of AAPURTI lies in the fact that huge data of PDS automation is efficiently managed to provide hassle-free environment for data updation and reporting. Project roll out has been quite smooth while costs have been kept at the minimum by leveraging available e-Governance infrastructure, to the extent possible.

Point-of-Sale (POS) devices & UID Integration
To ensure the delivery of subsidized grains to the eligible beneficiaries, UIDAI integration has been used with PoS device. Adhaar based biometric authentication has been used to help in plugging leakages by providing check on fake beneficiaries or fake delivery. This will further improve the cost effectiveness of the system.

Supply-Chain Management System
Online allocation of commodities from State head qrs to districts and further upto the FPS as per digitized ration cards numbers to ensure exact quantity allocation as per closing balance of the previous month. Automation of movement challan, dispatch order and stock receipt at FCI Depot, at State Godowns and at FPS to track the leakages & diversion in commodity transportation. SMS alerts help citizen to track the movement of commodity.

e-Procurement
This initiative has strengthened procurement operations, developed a near real-time reporting mechanism and a decision support system for enhancing the monitoring and tracking capabilities of the State Government. It has impacted the forecast, preparation, implementation, monitoring and feedback so as to make the system efficient and transparent.

NFSA Ration Card service
Integration with e-District to ensure delivery of Ration Card services through Common Service Centres (CSC).

Ration Management System
Various exception reports based on logical values and list of duplicate beneficiaries etc. has been generated to remove bogus/ghost beneficiaries.

Mobile App
Mobile App has been developed to provide basic facilities like Ration Card Search, Fair Price Shop Search, view NFSA eligibility criteria etc.

Responsive Web Portal
GIGWcomplaint portal is responsive enough for Smart Phones and Tablets etc. through call centre application out of which 59,607 have been resolved and disposed.

Extent of integration
- Integration with National Health Insurance Scheme using web services
- Integration with UIDAI for biometric authentication of beneficiary using Aadhaar
- Integration with e-District portal for NFSA applications.
- Integration with National PDS Portal through web services provided to NIC HQ, New Delhi for various reports.
- All DMs have been provided login on the web portal for overall progress monitoring of the district through exhaustive MIS.

ENABLER INDICATORS
Process reengineering

Major ICT and Non-ICT process changes
The existing public distribution system was completely manual. The information collection was time taking. Redundancy and inaccuracy was a common problem. In

order to make the system transparent and automate the manual workflow of the department, the development team of NIC-UP undertook an exhaustive ICT process reengineering of PDS in accordance with NFSA. Few brainstorming sessions were conducted with Commissioner, Food & Civil Supplies Department, UP to further enhance and improve the system. It also culminated into culture and behavioural change of department officials from being computer reluctant to computer geek.

- The requirement of the Food & Civil Supplies Department, UP was IT enablement of PDS system as per NFSA, without much change to the underlying processes. It was desired by the department to implement the desired system with minimal legal changes, easier status updates, real time Management Information Systems (MIS), anytime / anywhere service etc.
- The baseline study involved thoroughly understanding the existing system of Ration Card Issuance and PDS Supply Chain Management. An effective and user friendly computerized system was designed as per the requirement keeping in mind all the users and roles involved.
- Prior to the implementation of *AAPURTI,*detailed study of the entire system was done so as to provide easily accessible services to the citizens with minimum cost and time for service delivery.
- While designing and development of *AAPURTI*, service quality was kept at top priority. Objective of the project was to deliver services with best possible user experience.
- All the existing processes of PDS Supply Chain were studied in detail to provide an efficient, robust, transparent system without leakages.

Challenges faced in implementing Process changes

- Reluctance or discomfort in some department employees to adopt the new computerized system.
- Manipulation of the system with widespread collusion across the supply chain.
- Inefficient government machinery, lack of accountability, poor vigilance mechanism, bottlenecks in transportation of food grains, irregularities of various kinds at Fair Price Shop (FPS) level, and high level of corruption.
- Multitude of Bogus (ration cards belonging to fictitious families) and Shadow (genuine ration cards used by someone else) ration cards in the system.
- Errors in manual information and data management were all time high.
- PDS details were provided by departmental staff to data entry operators. This was not error proof.
- There were earlier attempts at addressing the challenges. This focused on identifying the "Physical Theft" by using tools like additional Human monitoring, Global Positioning Systems (GPS) to track the movement of trucks and Electronic Weigh bridges. All these tools have proved easily by-passable.
- Failure in effective functioning of the new system due to corruption and mismanagement.

The Lessons learnt from the Process re-engineering exercise

- When the timeline was short and the conversion was near, BPR efforts were diminished as a priority and the software conversion became the single focus.
- Making the project a priority but not realigning workload is a conflicting directive. Team leaders constantly struggled with balancing their already full schedules and finding the additional time to devote to the project.
- Tackling the combination of a major software conversion infused with business process reengineering is not a light task. We were able to succeed because of the strong leadership and support from senior administration.
- The reengineering of business processes may not have been as widespread as we had hoped, but the exercise of taking a critical look at processes has had lasting effects beyond the live conversion date.

Best practices adopted

- *Reusability:* Reusable and customizable components have been used to facilitate easy and rapid development in order to meet out the ever increasing requirements of the Food & Civil Supplies Department.
- *Codification Scheme:* Codification scheme of Census 2011 as per the standard of National PDS Project has been adopted from NIC Delhi. Census 2011 codes have been used for districts, tehsils, towns and villages so that the state database can be easily integrated with National Centralized PDS database or databases of other sectors whenever required.
- *Interoperability:* Other applications can also use sets of Web Services provided by which when consumed, returns XML/Jason based Output. Web services are used to make the System platform and technology independent.
- *GIGW compliance:* Web Portal has been redesigned as per the Guidelines for Indian Government Websites (GIGW). Design of the portal is made responsive enough for compatibility with Smart Phones and Tablets.
- *Audit Trails:* Audit trails are important in maintaining security and complete analytical analysis of the TTPDS-UP system. Audit trails keep detail information about transactions performed in the system with time stamping by the users of the system.
- *Security Concerns:* Web security features have been implemented in adherence to the standards of Open Web Application Security Project (OWASP). One Time Password (OTP) has been used through SMS for verification of users before registration. Digital signatureshave been used for issuance of Ration Cards. Web security audit of the application has been done by third party CERT-IN empanelled auditors to remove vulnerabilities.
- *Durability:* An effective 'resilience roadmap' has been developed to ensure that IT infrastructure can comfortably handle spikes in transaction volume in peak hours. Our system has been developed and tested to process much higher transaction volumes, to account for any eventuality.
- *User manual* which define methodology, process flow and responsibilities of stake holders are frequently updated and uploaded on the web portal.
- *Dash Board* on web portal is indicative of number of NFSA households Entered, modified, digitally signed, printed etc. in each district. Exhaustive MISare quite handy in quick dissemination of information.

- *Green Governance:* Every possible attempt has been made to make the entire system paperless.

Leadership, Change Management, Capacity Building

- Quarterly review of the project is being done by committee headed by Chief Minister Office. This committee includes Chief Secretary-UP Govt., Principal Secretary-FCS Dept, Commissioner- FCS Dept. and State Informatics Officer-UP.
- Monthly review of the project is being done by committee under the chairmanship of Chief Secretary-UP. This committee includes Principal Secretary-FCS Dept, Commissioner-FCS Dept, State Informatics Officer-UP and Additional Commissioner-FCS Dept
- Once every 15 days, review of the project is being done by committee under the chairmanship of Commissioner-FCS Dept. This committee includes Additional Commissioner-FCS Dept, Project Head from NIC (Senior Technical Director), and Technical Team of NIC comprising of one Technical Director, one System Analyst and Two Technical Officers.
- Project is being implemented at field level with the help of officials of all 75 NIC district offices and all 75 district supply offices spread over the entire state.

Change management and Capacity building strategy

Based on the project vision, guidelines from the government or feedback from the users, new functionalities, customizations and improvisations are often desired. Whenever such a requirement is raised, technical feasibility of the desired change is done by NIC team. Impacts of implementing the change on the system are analysed thoroughly. After the initial test results seem satisfactory, changes are done in the development environment. New version is tested for the intended functionalities. If the new version fulfils the requirement without any flaw or side-effect to other functionalities, upgraded version of the application is launched after approval from the user department.

Project management & Monitoring

AAPURTI project is an ICT based gigantic task to streamline the widest PDS network system in the country. The focus of the project is to improvise the working of the existing PDS system in the State keeping in view the NFSA norms.Project roll out has been made quite smooth while costs have been kept at the minimum by leveraging available e-Governance infrastructure, to the extent possible. Web/database servers are deployed at UP State Data Centre. User-friendly web application has been developed by NIC-UP State Unit and is in active use at all the districts of Uttar Pradesh. System and Database Administration is also done by NIC-UP State Unit.An effective 'resilience roadmap' has been developed to ensure that IT infrastructure can comfortably handle spikes in transaction volume in peak hours. Our system has been developed and tested to process higher transaction volumes, to account for any eventuality.Stakeholder participation was important to ensure that the roles and responsibilities post re-engineering of processes were complied. Suggestions and feedbacks have been taken proactively from the stakeholders during the design, development and testing of software applications.

Financial model adopted

The project is funded in shared mode by Central and State Government. Total project cost till now is Rs. 97,67,58,570/-. Out of which 50 % share (Rs. 48,83,79,285/-) has been borne by Central Govt. and 50% share has been borne by State Govt.

Special efforts to ensure sustainability of the e-Governance initiative

Sustainability forms an integral part of AAPURTI because of extensive use of ICT to facilitate transformation. User Privacy and security of information is ensured through role based model with password protection. Passwords have been encrypted using MD5 hash and salted MD5 hash is used at the time of user authentication. Every possible measure has been taken to prevent session hijacking/fixation or role infringement attacks. Digital signatures have been used for issuance of Ration Cards. Web security audit of the application has been done by third party CERT-IN empanelled auditors to remove vulnerabilities and ensure security of the system.

Challenges faced in transition

- Food & Civil Supplies Department, GoUP has laid significant stress on capacity building for successful implementation ofAAPURTI project. Department has conducted training programmes for its staff on computer usage frequently.
- Seminars & Presentations – Selected officers are invited for brainstorming sessions, seminars and presentations where the domain specialist share their views and deliberate on various administrative, and operational issues related to the project implementation.
- Having multiple types of users in each location (head-quarter/division/district/tehsil/block) makes change management and capacity building extremely difficult tasks. Not only we have multiple hands touching the environment, there were often gaps in communication and practices between the involved parties.
- It was a big challenge to ensure that the new system actually aligns with and streamlines existing practices of the department.
- People can misuse even the most robust and well-aligned systems. So, effectively managing change also meant avoiding misuse of the system either deliberately or due to ignorance or lack of proper communication down the line.
- Implementation of the new system was difficult due to lack of confidence or fear of the unknown among the users.
- The users were reluctant to use the new system as it was upsetting their well established routine.

The Lessons learnt from Change Management and Capacity building

- The officers of FCS Department must be aware of what needs to be done, what benefits and what pains may be involved. For that, we need dialogue, communication, convincing and persuasion.
- Without the FCS department users accepting the intended change, the project cannot be implemented successfully. Moreover it is extremely difficult to force change upon people who does not accept the change.

- It is important to identify resistance from the department users as early as possible and reassess as we move through the change process
- Once the change is accepted, the administrators should call upon the users to participate in customizing the proposed project management plan and adapt the plan to the environment in which they work. The adaptation (or customization) process will further encourage the users to take ownership of the project.
- The users may actually welcome the changes easier, if they had been aware, and have accepted the intended changes. Finally by participating in adapting or customizing the intended plans to change, the users will have taken fuller ownership of the project.

Technology

In AAPURTI, ASP.net Web Applications built on .net 4.0 framework are being used. Applications are hosted on IIS 8.5 over Windows Server 2012 R2 Operating System. Microsoft SQL Server 2012 database is being used on backend. AAPURTI is hosted in cloud infrastructure of UP State Data Centre. Six virtual machines with high-end configuration have been used for application hosting. Network load balancer has been used to optimize performance.

Strategy for Disaster Recovery and service continuity

- The database and web servers are hosted in failover cluster mode to ensure high availability of services with minimum downtime in case of hardware failure.
- SAN storage with Raid 5 has been used for protection of data in case of disk failures.
- Data Backup & Archival policy is framed as per the department's current data needs.
- Weekly Full Backup and daily differential backups of the databases are maintained.
- Database Backups are copied to external media daily.

Impact and value-addition thru adaption of Social media

- AAPURTI portal has been developed as per GIGW guidelines.
- AAPURTI web portal has been linked with profiles of Food & Civil Supplies Dept., UP on social networks like Facebook, Twitter and Google+.
- Mobile app of the department has also been linked with social networks like Facebook, Twitter and Google+.
- Important announcements, notifications etc. are often broadcasted through social media by the department
- Mobile app compatible with Android version 4.1and above has been developed which can be used easily by any citizen for basic services like ration card search, Fair Price Shop search and viewing eligibility criteria for NFSA etc.

Technology related challenges

- *Data Security & Hardware Resizing according to Data Growth* - The project has been deployed at State Data Centre which is owned by the State Government. SDC has got redundant Power backup, cooling and network Infrastructure to support the Data servers, Web servers & overall networking under the project to provide efficient environment for successful implementation of the project. Time to time hardware resizing and maintenance carried out so as to manage ever increasing data volume and net load on the web applications.
- *Security Threats in Automated System* - Security measures have been taken into consideration during software development and security audits have been done on frequent basis so as to save the system and data from internet vulnerabilities. Captcha, digital signature, data encryption, QR code etc have been implemented in software.
- *Continuous Software Maintenance/ Enhancement* - Work flow based software has been designed after the recommendations of department's officials as per the practical needs of department various tasks and dealer community as well. Also the software is tuned/ modified time to time as per the hour need of officials and/or related stakeholders.
- *Technology Risk* - Technology risk involves using technology that already is or is soon to be obsolete in development of s/w. Such software will only be functional for short period of time thus taking away resources from the department.

The Lessons learnt from Technology choices and implementation strategy

- To decrease the technology risk, since the technology changes rapidly, it is important to pay importance to this risk and upgrade the software with new technology time to time.
- Implementation of technology must be preceded by clear vision and setting up of goals after exhaustive analysis of the system.
- Reusable components should be used to maximum possible extent to save time and energy of the development team.
- Development of customizable components can go a long way in ensuring project sustainability.
- To decrease the Management Risk: Department's officials' and staffs' motivation or willingness is a must in helping the software development team, Monthly meetings are conducted for field level officials for ensuring their participation in IT enabled system.
- Clear roles and responsibilities should be assigned to every party involved in analysis, development and implementation phases in project execution.
- Prior evaluation of system requirements is very crucial to ensure availability of required hardware/manpower resources at the time of roll-out for successful implementation without wastage of time and money.
- Training, technical support and initial handholding of the users is essential for successful roll-out of the project.

VALUE INDICATORS
Digital Inclusion

- UIDAI integration with e-pos for ration distribution to ensure legitimate beneficiary should get the subsidized grains.
- Bilingual android based Mobile App has been developed to facilitate all type of stakeholders.
- SMS alerts are generated in Hindi to ensure the acceptability in all types of citizens.
- Entitlement of various government welfare schemes, free / subsidized medical treatment in Govt. Hospitals etc. in UP is being verified online from AAPURTI portal.
- Training video has been provided to ensure hassle free implementation of the application.
- Almost 360 degree Supply and Marketing wing of the Department's functionality has been automated so overall system proves to be efficient, time-saving, better management and analysis of digital data collected from various web applications for the department.
- Multilingual Support -All the content in AAPURTI web portal is displayed in Hindi (the language of UP) as well as in English.
- Suggestions and feedbacks have been taken proactively from the stakeholders during the design, development and testing of software applications.
- Software related training has been provided by NIC State & District Team to various stakeholders involved in the system from time-to-time.
- Stakeholders are provided full technical support whenever required by them.
- An effective and user friendly system has been designed for NFSA implementation in PDS keeping in mind all the users and roles involved.
- Easily accessible services to the citizens have been provided with minimum cost and time for service delivery.

Green e-Governance
Towards Green e- Governance:

- All the transactions at the Fair Price Shops are being done electronically using PoS machine and SMS alerts are generated to reduce paper consumption.
- Various services required by the department have been provided online with role based access to reduce paperwork within the department.
- Citizens can submit online requests for new ration card, ration card correction, surrender, complaints and suggestions. Citizens are not bound for submitting applications on paper.
- All communications with stakeholders is done using email, video conference or telephone. Communication through paper or physical visit has been reduced to the bare minimum.
- Online availability of Acts/Rules/Notification/orders/Tax Rate/Commodity Codes etc.

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JanDhan PDS
Food and Civil Supplies Department, Government of Andhra Pradesh

G. Ravi Babu, Babu A. and A. Guru Prasad

PROJECT OVERVIEW

Government of India Provides Subsidized food and fuel to the targeted family covering BPL, and AAP groups under Targeted Public Distribution System (TPDS). The system is not able to reach real beneficiaries due to wrongful exclusion, inclusion, large-scale pilferage, duplicates and ghost beneficiaries and lack of identity of real beneficiaries. The Government of Andhra Pradesh seeks to implement cashless payments using existing biometric terminals in selected fair price shops in Vijayawada, Krishna district through AEPS. This will be aimed at demonstrating cashless payments JAM (Jan Dhan Aadhaar Mobile) by beneficiaries of the public distribution system (PDS) to fair price shop merchants based on biometric authentication. It will be implemented in all FPS outlets in Krishna district.

Government of Andhra Pradesh has successfully implemented Aadhaar enabled Public Distribution System in all Fair Price Shops (28,350) across the state and its well stabilized for the last one year. On an average 20-25 lakhs transactions takes place during first week of every month and by 10th of every month 85 percent beneficiaries across the state, avail their ration in one go. AePDS upgraded to JanDhanPDS by integration of Jan Dhan Accounts of beneficiaries with the dealer account for seamless transfer of money using AEPS using onus or off-us transactions. This is the only of its kind in entire country to implement JAM technology in PDS.

RESULT INDICATORS

Money deposited to JanDhan account under various Govt. schemes such as MANREGA, old age pensions etc., can be used under cashless option of Aadhaar enabled Public Distribution System for availing the ration. This will enable beneficiary to make use of his bio-auth as a virtual debit card to avail the ration, direct benefit to the genuine beneficiary. Ration portability to avail ration from any Fair Price Shop across the state. Ration can be availed any number of times within the limits of entitlement.

Key Performance

Four key services are currently being delivered:

- Creation & Management of digitized Beneficiary Database
- Supply-Chain Management of TPDS commodities from Food Corporation of India (FCI) till Fair Price Shops (FPS)
- Sale of TPDS commodities at Fair Price Shops (Cash and CashlessPDS) including identification and authentication of beneficiaries and recording of transactions.
- Transparency and Grievance Redressal Mechanism

Benefits obtained from these services

Elimination of ghost ration cards of around 77 lakhs with the help of Aadhaar seeding has help Govt. to save around 300 Cr monthly recurring expenditure.

Table: Benefits obtained

Sl. No.	Benefits	Unit
1	No. of BPL Ration Cards existing prior to Aadhaar seeding	1,37,89,537
2	No. of BPL Ration Cards after Aadhaar seeding	1,29,31,004
3	No. of Cards reduced on Aadhaar Seeding	9,58,533
4	No. of Units existing prior to Aadhaar seeding	4,51,52,747
5	No. of units after Aadhaar Seeding	3,58,79,468
6	Net Reduction in Units after Aadhaar Seeding	77,19,041
7	Saving in Rice Quantity per Annum (in MTs)	403142.460
8	State Government savings in Subsidy due to reduction of quantity on Aadhaar seeding per Annum (3,33,854.976 MTs * Rs. 7500.00) (in Rs.Ps.)	Rs.302.35 Cr

Year-wise transaction volumes for various services

Every month number of transactions in TPDS system with Aadhaar authentication is around 1.9 Cr for following modules of the application :

- ePDS – Ration card Management system
- SCM - Supply Chain Management
- FPS - Fair Price Shop Automation) / JanDhanPDS
- ICDS - integrated Child development system)
- MDM – Midday Meal Scheme.
- AUA and ASA services and their data are also stored.

Implementation coverage

Aadhaar based PDS distribution System – Profile of Andhra Pradesh State

Districts	:	13
Divisions	:	49
Mandals	:	670
Villages	:	17,751
FP Shops	:	28,942
Online Shops	:	28,321
Offline Shops	:	621
NFSA Cards	:	95,71,660
State PDS Cards	:	39,59,777
Total no of Cards	:	1,35,30,437
Total no of Units	:	3,82,91,110
Seeding Percentage	**:**	**99.94%**

Authentication of Cardholder and Distribution of Essential Commodities

- The minimum time taken for each transaction is 3 seconds and this is ensured by availing best finger detection mode.
- If biometric authentication fails IRIS reader is provided as an alternative.

- In case both biometric and Iris authentication fails, the ration is distributed with VRO authentication.

FP Shops Portability
- FP Shop portability is provided in order to ensure the migrant labour receives their ration at their place of work.
- On an average 6.5 % card holders avail this facility
- More in urban areas.
- The entire transaction can be monitored online on real time basis.

Offline Distribution of PDS
In case of 660 inaccessible shops, where signals are not available offline distribution with periodical integration system is put in place.

Table: Savings Chart for a period of 6 months from June – Dec' 2015

Commodity	Closing Balance (Qty. in MT's)		Savings	Value of Savings	Rate per MT (in Rs.)
	2014-15	2015-16			
Rice	14743	192430	177687	533.06	30,000
Sugar	469	9363	8894	18.41	18,500
Wheat	810	5282	4471	6.93	15,500
Total				558.40	

JanDhanPDS is a new service and it's a first of its kind in any DBT model. It's a complex solution with too many stakeholders. It's being implemented in Krishna District of AP.

Outcomes in terms of Efficiency, Improvements and integration
Time and cost efficiency improvements
Application is developed within the stipulated time framework and NIC services are at no cost because NIC provides services to State Government at no cost basis.

Specific innovative ideas implemented
It's a unique solution.

The extent of integration
- System adopted in JanDhanPDS is completely online aadhaar based authentication at every stage of workflow to ensure entitled beneficiary to avail ration with total transparency with ration portability.
- The technology mainly targets to check proxy issues & uniqueness of the beneficiary across the system.
- Implementation of the AePDS system helped in savings of around 9-10 Crores per district per month by pluging in leakegesand availing the ration by only genuine & needy beneficiaries. JanDhanPDS is an extension of cashles service to AePDS and its being implemented in District Krishna on pilot basis. By Dec' 2016 this model will be replicated across the state.
- Post implementation of AePDS total savings (for entire state) have been worked out to be of worth of arounf Rs. 1028 Cr. Per annum.

Main focus was on Inclussiveness of the beneficiary. Oldage, leprosy & bed riddenbeneficiaries have beeen identified by the Joint Collectors of the respective districts and tagged to VRO for autneitication and drawn commodities will be delivered to their door step by the Village Revenue Officer.District wise shop wise availed cards with percentage of cards availoed is being displayed in public domain. Portal is more transparent with all analysis report. Portal URL is http://epos.ap.gov.in

ENABLER INDICATORS

Table: Pre-implementation and Post-implementation

Sl. No.	Indicator	Earlier to AePDS	After AePDS
1	Sale of PDS commodities to BPL beneficiaries	99- 100%	86-87%
2	Sale of kerosene	100%	55-60%
3	Average number of trips to fair price shops to take different commodities	4 – 5	1
4	Portability within and across the districts.	Nil	7.29%
5	No. of beneficiaries benefited by Portability	Nil	852623
6	Quantity , Cost & Time of distribution	At the mercy of the dealer	e-Weighing machines & Stock movement in time
7	Transparency	Dependent on FPS dealer	Portal, SMS & Mobile App
8	Social Factor	Does not exits	Proper utilization
9	ICDS, Social welfare hostels, other institutions, MDM	NIL	Enabled

Process reengineering
Major ICT and Non-ICT process changes
Enabling the cashless option in fair price shop is an process change initiative taken by Govt to facilitate Jandhan+Aadhaar+Mobile concept for availing the ration.

Challenges faced in implementing Process changes
Reversal generation by micro ATM -
- Reversal will not be generated by microATM when a response (either success or failure) is received
- The microATM will wait for 120 secs to receive the response from Acquiring Bank, after which it will terminate the transaction
- Once the transaction is terminated due to timeout, one-time Reversal will be generated by MicroATM immediately
- Reversal Generation by Acquiring Bank

- Handling of entitlement and reversal by JAM server
- During the initial interaction of POS and NIC, only the eligible entitlement is given to POS. All the cases need to be communicated with NIC. NIC will debit the entitlement only in the success case, during which NIC sends the permanent reference number to banks.

Handling of reversal failures in Manual Reconciliation on T+1 day by Banks and NIC

- All the reversal failures and transaction failures will be marked as pending in microATM database and Bank database. These will be reconciled the next day.
- On T+1 day, Banks need to communicate with NIC all those cases where the permanent reference number is generated. This will enable NIC to reverse the entitlement.

Lessons learnt from the Process re-engineering

We could able to achieve the results with the coordination effort from all the stakeholders. Explaining the process change and understanding the stakeholders concerns and addressing their issues to achieve the end results is a big learning process and it will help in future enhancements.

Best practices adopted

It's a unique model and first of its kind in the country. It's a process beyond the DBT model.

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative

User initiative will be the driving force and facilitating the interactions with top level management is a crucial to achieve the end results.

Change management and Capacity building strategy

Capacity building is an important entity in the implementation process of the project. Carried out multiple sessions of user level interactive programs

Financial model adopted

NIC being a IT department under Govt. of India, providing complete free support to Department of Civil Supplies, Govt. of Andhra Pradesh and other stakeholders like Banks and NPCI provided service for free as it's an initiative of PMO to implement Jandhan Aadhaar Mobile application in Govt. Schemes.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Present model of Aadhaar enabled Public Distribution System is being implemented for the last one year successfully and its stabilized process covering 3.8 Crore population across the state. JanDhanPDS is being implemented to District Krishna and will be replicated across the state by Dec' 2016.

Challenges faced in transition
Coordination, enabling and updating of all the stakeholders is a major challenge

The Lessons learnt from Change Management and Capacity building
Looking at the literacy level of beneficiaries, multiple sessions of capacity building is essential to achieve the end results.

Technology
Technological solution adopted
It works on open source technology

Compliance of the Technology adopted
Financial inclusion of eGov standards of Govt of India has been adopted.

Strategy for Disaster Recovery
Application has total DR facility with failover mechanism

Impact and value-addition thru adaption of Social media
We are using social medial platform such as face book & youtube for the project value addition.

Technology related challenges faced
Integration with NPCI and Core Banking is a real challenge. Initially NPCI had not geared up IRIS based authentication with this kind of solution but over a period of time it has upgraded their facility.

VALUE INDICATORS
JAM is a vision of Hon'ble Prime Minister of India and he is the Main value addition to this initiative Chief Economic Advisor to Govt. of India has made field visit to inaugurate and understand the total system in place and he appreciated the kind of efforts put into this model.

Digital Inclusion
Local language facility is provided both audio and display at the device level for better understanding the application.

Green e-Governance
There are no manual registers that are maintained.

Shri G Ravi Babu, *IAS, Director, Civil Supplies & Ex Officio Addl. Secretary*

Shri Babu A, *IAS, District Collector*

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NDLM Mobile Audit Survey
ITE and C Department, Government of Telangana

Jayesh Ranjan and Raja Kishore

PROJECT OVERVIEW

Making one person in every family digitally literate is one of the integral components of the Prime Minister's vision of "Digital India" Audit of all these NDLM centers those given the training to the citizens and Citizens those who have trained for maintaining the Quality. First time in India making the NDLM audit survey for improving the qualities among the centers and training to the citizens.

As part of "Digital India" Initiative, Department of Electronics & IT has approved scheme entitled "Digital Saksharta Abhiyan" (DISHA) – a National Digital Literacy Mission. The Digital Saksharta Abhiyan (DISHA) or National Digital Literacy Mission (NDLM) Scheme has been formulated to impart IT training to 52.5 lakh persons, including Anganwadi and ASHA workers and Authorized ration dealers in all the States/UTs across the country so that the non-IT literate citizens are trained to become IT literate so as to enable them to actively and effectively participate in the democratic and developmental process and also enhance their livelihood.

In Telangana

As part of the aforementioned scheme 155,000 citizens (1 citizen per household) have to be trained in Telangana. Directorate of ESD (MeeSeva) under the guidance of Information Technology, Electronics & Communication(s) Dept.- Govt. of Telangana has been identified as State Implementation Agency (SIA) for IT Mass Literacy Program roll out at state and has signed a MoU with CSC SPV, DeitY, GoI for successful implementation of the aforementioned program at Telangana under the aegis of NDLM-IT Mass Literacy Program. As a part of NDLM trainings in Telangana the analysis is like

- Total Training Partners those who trained the citizens is 45, Total VLE's (Village Level Entrepreneur) also trained the citizens are 790. Total Citizens 1.37 lakhs households including Anganwadi & Asha workers were trained in Telangana.
- Motto is to survey the all these Training Partners, VLE's and Citizens those who were certified through NDLM Mobile Audit survey application have to survey.

The main objectives of the project are:

- In Telangana till now there are 45 Training Partners centers and 790 VLEs training centers and Total 1.37 lakhs citizens per house hold were trained.
- Objective of this NDLM Mobile Audit Survey through this application have to survey all the Training Partners and VLEs training centers for maintaining the transparence among the maintaining the quality and reaching out the guidelines.

As well as through this application have to survey the citizens on the training criteria trainer, center details and how the Training partner and VLEs conducted the examination.

RESULT INDICATORS

Earlier system in NDLM

National Digital Literacy Mission previously there is no mechanisms of inspecting or survey the Training Partner, VLEs centers and citizens, and how much knowledge gained through this training by the citizen is not at captured but the citizens were certified upto the mark.

New System after implementation of NDLM Mobile application

After the deployment the NDLM Mobile Audit Survey application project there is an accountability how many active centers were seriously working on this NDLM training, Training Partners and VLEs centers were reaching out the guidelines are also be monitored. The knowledge gained by the citizen through this training is also to verified, it is increase the quality of training to the citizens by the centers.

Key Performance

As of 15th July 2016 in Telangana 346281 beneficiaries have been registered including Anganwadi workers, Asha workers and Authorized Ration shop dealers, 293450 are trained and 137365 are certified under the project. There are 45 active Training Partners and 790 Meeseva (CSCs) implementing the NDLM program in Telangana. Expected target in future have to be announced by the Central Government.

- Conducting the NDLM Mobile audit survey to all the 45 Training Partners centers.
- NDLM Mobile audit survey to all the 790 VLEs centers among the districts of Telangana.
- NDLM Mobile audit survey to all the certified citizens i.e 1.37 lacs.

Survey will be conducted by the District Managers (IT Department) of each district. Involving the volunteer organization like TITA

Implementation Coverage

In implementation of this NDLM Mobile Audit Survey application we have taken the three basic things i.e.,

- Planning & preparation for implementation - Planning and preparation for implementation basically ITE&C Department have developed the application named NDLM Mobile Audit Survey application and piloted to all the districts of Telangana through our IT Team Member DM (District Manager).
- Implementing and monitoring the action - For implementing and monitoring the project, ITE&C Department formed the PMU Team for monitoring and coordinating the Project through various involvers.
- Reviewing and analyzing the success of the action - Regularly the Team along with the HoD will continuously reviewing and analyzing on the Project.

Outcomes in Terms of Efficiency, Improvements and Integration

After the deployment the NDLM Mobile Audit Survey application project there is an accountability how many active centers were seriously working on this NDLM

training, Training Partners and VLEs centers were reaching out the guidelines are also be monitored. The knowledge gained by the citizen through this training is also to verified, it is increase the quality of training to the citizens by the centers.

- This project improves the quality of training.
- Training Partners, VLEs were maintaining the good infrastructure
- Trainers will imparting the training as per the guidelines and training them well and moving forward for certification.
- Citizens were aware of training content.
- Transparence improving in training among citizens, training partners and trainers.

Mainly citizens were learning all the content as per the guidelines and improve their skills among the Digital devices and Literacy.

ENABLER INDICATORS

In implementation of this NDLM Mobile Audit Survey application we have taken care of three basic things i.e Planning & preparation for implementation, Implementing and monitoring the action. Reviewing and analyzing the success of the action.

- Planning and preparation for implementation basically ITE&C Department have developed the application named NDLM Mobile Audit Survey application and piloted to all the districts of Telangana through our IT Team Member DM (District Manager).
- For implementing and monitoring the project, ITE&C Department formed the PMU Team for monitoring the coordinating the Project through various involvers.
- Regularly the Team and the HoD will continuously reviewing and analyzing on the Project.

Process Reengineering

This has been conceptualised for this year only as part of automation we enabled the accessing for the stakeholders through Mobile enabled devices in Online mode.

Leadership, Change Management, Capacity Building during Transition

As part of change management it has been trained for the key stake holders are CSC-Managers to all districts for keying the survey details and this data triggers to main application and we also provided necessary technical and necessary support through dedicated PMU Team and resolving the issues with the e-mail ID ndlm.tg@gmail.com. As a part comes to Capacity Building conducting training on this Mobile App to all the stake holders involves (e-District Managers, TITA Volunteers participating actively).

Technology

The application has been developed and deployed by ITE&C Department and technology used in this application is "Open source Android V 2.2 and above and Apache tomcat 7.0, Server (Sql server 2012)"

VALUE INDICATORS

There are 45 active Training Partners and 790 Meeseva (CSCs) implementing the NDLM program in Telangana. Expected target in future have to be announced by the Central Government.

- Conducting the NDLM Mobile audit survey to all the 45 Training Partners centers.
- NDLM Mobile audit survey to all the 790 VLEs centers among the districts of Telangana.
- NDLM Mobile audit survey to all the certified citizens i.e 1.37 lacs.

Digital Inclusion

Digital Literacy is an increasingly powerful tool for:

- Bridging the digital divide by spreading digital literacy
- Expand access to ICT and harness it for various development activities
- Facilitating delivery of basic services such as market prices of goods they produce; health services; improving the quality of livelihood, etc.
- Increasing people's participation in global markets, governance and administration
- Facilitating access to knowledge, education and skill development.

Green e-Governance

As a part of NDLM Mobile Audit Survey application, through this app we are encouraging paperless i.e., completion of Audit survey can be done with ICT gadgets/Mobiles and the data is securely saved in the database.

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Social Security Pension Schemes through DBT
Department of Social Justice and Empowerment
Government of Haryana

Amit Jha, Sekhar Vidyarthi, Ghan Shyam Bansal and Susheel Kumar

PROJECT OVERVIEW

Haryana government is providing financial assistance under social security schemes of Old aged, Widows, Disabled persons, Destitute and non-school going disabled children, Ladli (girl child), Eunuch, Dwarfs of the State and to Kashmiri Migrants in the form of monthly pension, who are unable to sustain themselves from their own resources and are in need of financial assistance. There are more than 23.66 lacs such beneficiaries in the state. The Department of Social Justice & Empowerment, Government of Haryana at State and District level is responsible for handling such a large number of beneficiaries' & their records for monthly disbursement of pension at their door step. For one reason or the other there have been reports & grievances of non-disbursement of pension, disbursement to wrong persons, errors in beneficiaries' list and delayed availability of requisite data-information as and when required by Government therefore to improve upon the services & benefits delivery system and to have better administrative aspects for handling such a large number of records, a district level software/database system (HaPPIS) was developed & implemented 13 years back for updation of pensioners records, processing and printing of bulky APRs reports village & pension scheme wise for monthly disbursement of pension by revenue officials/ PRIs members. Initially a static website was also hosted for publishing of required information of pensioners and forms, procedures & welfare schemes.

Over the span of 10-13 years, the system existing needed upgradation due to change in requirements and state-of-the art usage of the Latest Technologies and systems.

Detailed points are as under:
- Lack of Transparency in handling of beneficiaries data/records
- There was No centralized control on deletion of dead, in-eligible, duplicate beneficiaries and insertion of new beneficiaries in the database list, also there have been reports of non-disbursement of pension, disbursement to wrong persons, errors in beneficiaries' list and delayed availability of requisite information
- New Applications receipt, processing, approval and enrollment was at district level, only, and that was needed to be expanded upto the level of Block/MC offices.
- No mechanized channels for taking feedbacks, grievances receipt and addressing
- No effective mechanism for data compilation at state level & dissemination of required information electronically.
- No effective methodology for filtration of duplicates and ineligible beneficiaries.
- Considerable delays in disbursement of pension

In view of above, for strengthening of the pension/benefits disbursement system and to overcome with the other problems of old system; it **was planned to**

introduce the DBT scheme through banks/postal across the state of Haryana for remittance of benefits directly to bank accounts of the beneficiaries. The solution development work started in-house in the month of October 2010, EBT started w.e.f April 2011 and DBT started w.e.f Feb 2015.

Objective of introducing the DBT system
Initial objective of the project is to remit Pension allowances in the bank/ post offices accounts of beneficiaries using DBT (Direct Benefit Transfer) for timely disbursement to the right beneficiaries. Secondly, shifting on APB (Aadhaar Payment Bridge) to enable AEPS (Aadhaar Enabled Payment System). **CASH disbursement fully stopped.**

Approach adopted for implementation of DBT System
- Migration of existing district level databases of pensioners to the centralized database and made it accessible to each district through a dynamic website using respective user-ID/password.
- Each beneficiary assigned a state level unique pensioner ID.
- Interfaces of the centralized beneficiaries' database provided to all 62 banks, Postal department and Vodafone for uploading of Accounts, Aadhar and flagging of dead beneficiaries.
- To credit the pension into beneficiaries accounts, the state Govt. had conveyed to the banking agencies to upload exiting accounts like PMJDY or Saving accounts with the consent of beneficiaries. In case beneficiary does not possess any account the open new pension account for uploading to the database.
- Audit trial Log started generating on server to track the change made in the beneficiary data. District Social Welfare Officers (DSWOs) made responsible & accountable for data updation.
- Receipt of new applications at Block/MC level offices, their approval & data entry at district level by DSWO on central website.
- Banks were engaged district wise for enrolment of beneficiaries of the centralized database, opening of no-frill, single, without ATM/debit cards saving bank accounts as per KYC norms and issuance of smart cards to the beneficiaries.
- Generation of district wise XML files (digitally signed) every month for carded and non-carded pensioners as per the up-to-date data available on the website and transmission to banks for remittance of pension to the accounts of carded beneficiaries on the other hand enrollment and opening of accounts remained continue for non carded beneficiaries.
- Establishment of Customer service providers (CSPs) at village/Blok/MC levels and manned by bank/BCAs for enrolment, disbursement of pension as well as addressing of grievances and taking feedbacks of beneficiaries.

RESULTINDICATORS
Key Performance
Services Delivery(G2C, G2B, G2G and G2E):
- G2C - Services
    i) Online application submission through CSCs/DSWOs

ii) Credit of beneficiaries accounts by Pension/Arrears/Re-release.
iii) Opening of No frill accounts, enrolment for Aadhaar and their uploading
iv) Change of Beneficiaries credentials as per their request & KYC documents
v) Grievance handling
vi) SMS services for payments
vii) Help Line/call centre services.

- G2B - Services
  i) Data uploading Services to Banks, Post offices, VodaFone& CSCs have been provided controlled access of database for uploading of Accounts/ aadhaar, Flagging Deaths, accounts closure, downloading of data/information.
  ii) Digitally Signed PPO (Pay orders) are processed and downloaded by the participating banks, Post office, VodaFone etc. for crediting of accounts.
  iii) Services by CSCs of application receipt and Jeevan Parman integration

- G2G / G2E services
  i) Beneficiary data updation using Login- Id/password by DSWOs
  ii) Addition of new beneficiaries.
  iii) Flagging of Dead/ineligible beneficiaries
  vi) Correction in beneficiaries Names/ Credential
  v) Viewing of grievances and addressing them
  vi) Rights of data processing and uploading

Major Benefits derived out of the services:

- Timely remittance of the pension in the bank/ post offices accounts of the beneficiaries for withdrawal by right beneficiaries.
- **No Cash disbursement**. Misappropriation of funds minimized.
- Acceptance of applications at CSCs near the village. Door step delivery by Bank/ BCA/ CSCs to bed ridden beneficiaries.
- Full transparency achieved and information available at all levels through the dynamic website.
- Beneficiaries' database has controlled access with in a departmental workflow. No chances of mishandling data.
- Pension/ Arrears releases are 100% track able online by a beneficiary.
- Aadhaar Based De-Duplication is helping in identifying duplicates/ fake beneficiaries.
- No cost to the beneficiaries for getting services and department for solution development so far.
- After incorporation of CSCs and Bank BCAs, a travel burden on beneficiaries has minimized.
- Beneficiaries can keep their pension safe in bank accounts, also earn interest.

Table: Year-wise transaction volumes for various services

Service	Transactions (Nos) 2015-16	Volume (Nos) in terms of mode of delivery		
		Through Online direct	Through Department Counters	Through Citizen Service Centres/ Kiosks
New applications Receipts & processing to enrol a beneficiary	208529	154	185620	22755
Beneficiaries' Credentials change requests	68338	-	68338	-
Beneficiaries' account credit	27871015	27871015	-	-
Aadhaar Uploading	179708	179708	-	-
Account Uploading	146549	146549	-	-
'Online Hits' to view Beneficiaries personal & payment details	1834567	1834567	-	-
Grievances received online	4239	4239	-	-

Implementation coverage

Project is implemented across the State in all 21 districts for more than 23.66 lacs beneficiaries; pension disbursement under Direct Benefits Transfer (DBT) scheme through Bank/BCs was implemented in 21 districts, enrolment, opening of accounts, addressing of grievances has become a regular activity. The system has covered following demography:

- Total population of the state 2.58 Cr.
- Beneficiaries under 9 Social security pension schemes are 23.66 lacs. (beneficiaries covered by Vodafone: 11846, Post offices: 348792, Banks: 1964684)
- The system is implemented across the State in 21 Districts, 124 Blocks, 79 Urban Local bodies, 6079 Panchayats and 6720 villages for remittance of pension allowances into accounts.
- More than 1425 bank branches of 61 banks and
- More than 2735 BPOs are participating.
- Vodafone m-Pesa has also covered 68 villages of 9 districts

Stake holders' inclusiveness and participation

- Hon'ble CM and Ministers and Sr. officers of state are monitoring the scheme very closely.
- National Informatics centre as Technical partner
- District administration of all 21 DSWOs,
- 1423 bank branches and > 1500 BCA of 62 Banks,
- 16 HOs, 2350 Branch Post offices, Vodafone & 1494 CSCs.

Newservices /scope enhancements planned

- Most of the objectives are achieved and delivery of services have been started
- DBT has started in all 21 districts. NO Cash disbursement.
- More than 23.14 Lacs accounts have been opened and integrated with website by 61 banks/ Post offices and VodaFone through online interfaces.
- New Applications have been started receiving at CSCs (at village level), so far 22755 applications have received at CSCs
- Change requests from beneficiaries in their names, and other credentials
- Processing of PPO (pension pay orders) and downloading by disbursing agencies to credit the accounts of beneficiaries.
- Re-Release of pension into the accounts where bounced back taken place due problems at bank end.
- Service of e-KYC/ Jeevan Parman is also rendered through CSCs
- SMS and help line services have been rendered
- A new feature added which shall help in stopping pension credits where no withdrawal for last 3 consecutive months. Such accounts shall be termed as 'in-active'. In case the beneficiary does not report in the 4th month the account shall be termed as 'dead account'
- MIS is being developed for monitoring and tracking all credit / bounced back transactions to beneficiary.
- Up-to-date list of beneficiaries available on website for reference as well as copy of the same made available in Blocks/ MCs/ Panchayats for the beneficiaries to look for corrections if any in their records.
- A Beneficiary can track the payments made to him through online ledger/payment tracker and apply for corrections if any.
- Online Module for Grievance handling

Outcomes in terms of Efficiency, Improvements &integration

- Disbursement on 1st of every month to all available beneficiaries
- Timely remittance of the pension in the bank accounts of the beneficiaries as well as earning of interest as applicable to saving bank accounts
- Beneficiaries can withdraw required amount as per their convenience.
- No cost to the beneficiary for availing services
- No cost to the department for solution development as NIC Haryana is supporting technically for all required ICT support. However notional cost to NIC is estimated to be Rs. 30 lacs per annum
- The designed banks for providing obligatory services may be paid as per the RBI norms
- Beneficiaries can track their monthly pension without time.
- Up-to-date beneficiaries list made available in Villages /Panchayts/MC for the reference of beneficiaries

Specific innovative ideas implemented in eGov area and their impact on services

- Flash of in-eligible and defaulter beneficiaries on website enabling the administration to check & verify to prevent them from subsequent enrolment process.
- Opening of No-fril, Single saving bank accounts without ATM/Debit cards of beneficiaries and withdrawal by using smart card after finger print identification. It will fully stop the disbursement to proxy or wrong beneficiaries. Namberdar /Sarpanch may help in Identification in rare cases where bio-metric Identification is not successful
- SMS alert of remittance of pension amount shall be done to the account holder.
- Major outcome is to filter down duplicates/fake beneficiaries.
- Objectives and visions are to implement Aadhaar based disbursement using APB & AEPS.

The extent to which this e-Governance initiative is integrated with other internal / external ICT systems:

It is planned to integrate the initiative with Birth/death system of the state so that the dead beneficiaries could automatically mark as dead in the database of beneficiaries. Secondly with the system of issuance of UIED.

ENABLERINDICATORS

Process reengineering

To strengthen the entire process of pension disbursement starting from receipt of new application, processing, opening of accounts, capturing of Adhaar and their uploading to the beneficiaries' database and ultimately generation of PPO and finally DBT to accounts -following BPR has done.

- CSCs authorised to verify and submit application online and issuance of receipt to beneficiaries.
- Online Tracking of application status.
- DSWO finally reject/select the application and SMS sent to the beneficiary along with Beneficiary Unique Pension ID for future reference/ communications.
- Eligible applicant gets the unique Beneficiary ID and listed into the main beneficiary database and their entire record is track able from the public website (http://socialjusticehry.gov.in)
- More than 23.14 lacs accounts (97.83%) and 23.01 (97.29%) lacs Aadhaar have been uploaded online.
- Pay Orders to banks/Post offices is fully electronic through online treasury system
- Only DBT, NO cash disbursement
- In case of bounced back transactions, the disbursing agencies upload response file of transactions enabling the system to map the payments back to database.

Challenges faced in implementing Process changes

- Each district has their own database on their stand alone machines. No centralized validations and control were there. They had full ease in addition and deletion of beneficiaries without timely knowledge of approving authorities. Transparency was not there in addition and deletion of beneficiaries. There have been reports of non-disbursement of pension, disbursement to wrong persons, errors in beneficiaries' list and delayed availability of requisite data whenever required.

- Reconciliation of disbursed and un-disbursed funds was an uphill task and pension disbursement was delayed by months. There was no formal receipts of application were being given to beneficiaries. To overcome these issues a centralized database is created, secure and controlled access have been given to each stakeholder to manage valid and uniform data. To make website bilingual Unicode font introduced and legacy data converted accordingly for new system. Automate the process of APRs generation which provide the efficient time to staff for other productive work. Also the problems during online uploading of Accounts, Aadhaar were faced by bankers in the beginning specially for seeding Adhaar into bank accounts along with Technical network interface problems with different banks/ postal etc, and Human problems due to change in work culture. Also there was no Transparency in handling and addressing of grievances of beneficiaries. There was no mechanism and key to detect duplicates and Fake beneficiaries.

The Lessons learnt from the Process re-engineering exercise

- Effective planning of the project; Scope, stake holders roles, time& cost
- Effective & Educative publicity of the system
- Pilot run should be arranged prior to rollout
- Interfaces/access must be user friendly
- Un-scheduled down-time of servers/website must be avoided
- Risks of manpower and other resources should be mitigated.
- Change Requests must be controlled and their severity/ impact on the system must be quantified prior to incorporation & must be shared with the owner
- DR sites for database backups should be tested for data retrieval
- Peak load testing should be done
- Help Desk/Call centre must be run round the clock
- Accounts of beneficiaries must open after verifying KYC
- Names of beneficiaries must be as per the Aadhaar as a benchmark
- De-duplication must be on the basis of Aadhaar number as a main Key

Best practices adopted from the industry/ other State implementations

- At the application level security and confidentiality standards have been incorporated i.e. user-ID/Passwords, Authentication, Hashing/MD5 techniques of passwords, encryption of data and client-server side validation checks, protection from SQL injections. Since the application is hosted in at NIC data centre and the NIC, IDC are complying the standard

web policy of Govt. of India, therefore all issues relating to data security and Disaster Recovery are well addressed.

- For foolproof beneficiaries' account credit system we are incorporating APB (Aadhaar Payment Bridge) and to ensure payment in right hands, AEPS is under implementation. Haryana is itself front runner state for this project.

Leadership, Change Management, Capacity Building during transition
Leadership support for capacity building

- All required Political and Bureaucratic support is available for the project. The Chief Secretary of the state himself keeps on issuing guidelines as well as monitors the project progress time to time with all concerned Commissioners by calling meetings.
- For the sake of monitoring of the project very effectively, FC&PS (Financial commissioner & Principal Secretary) Level Sr. IAS officers (one officer-one district) have been allotted. Officers are making field visits as and when required but at least once a month and submit their report to the Chief Secretary.
- Since the project delivers social security benefits to more than 23.46 lacs beneficiaries of the state hence this is a sensitive matter in case benefits delivery hampered, hence the project implementation has consent of the minister concerned and Hon'ble Chief Minister of Haryana as well as it is progressing under their leadership.

Change management strategy
There are three types of changes

- District level officers are authorized to Add/Delete and modify beneficiary details on the website under controlled access
- Changes proposed from district level officers of the department and banks in the form of online transactions but sanctioned and committed into database at the level of Directorate at State level.
- Software / report related changes are received at directorate level and are reviewed with NIC Haryana and as per approval, changes incorporated for needful and betterment.

Capacity building plan

- State and district level trainings have been organized. As and when any change takes place that is also imparted on site at district level.
- District level officers are trained in software operations by NIC for updation of beneficiary data online.
- BC are hired, deployed and trained by Banks for delivery of services, enrollment and disbursement.
- Other staff members of the department are also trained in handing of allied related tasks.
- Demonstrations in the high level of meeting with minister and Sr. Officers
- IT cell creation and deployment of skilled regular manpower for sustainability of the   project by the department is under consideration

Project management & Monitoring
- To achieve the set objectives of the project at the earliest within the scope of the system and within the cost & time framework, all required efforts are being done. The major scope of the project is Enrollment & opening of accounts of beneficiaries, de-duplication and integration of accounts with the website data, processing and transmission of pension XML files to banks to credit the accounts of beneficiaries and disbursement through CSPs using biometric based smart cards by the beneficiaries.
- The Department of Social Justice & Empowerment, the designated banks& Post offices/ VodaFone, the NIC Haryana (solution developer) and beneficiaries are the main stake holders to the project. The responsibilities are assigned to all stake holders; progress is monitored by calling meetings and by viewing website and field visits. Impact of tardy progress in this project like non opening of accounts, non receipt of pension etc if any is reflected by the beneficiaries to the government and by show ups to Dy. commissioners. All possible risks are covered relating with the resources of manpower, ICT and others relating with Law and orders. Respective Deputy Commissioners are monitoring and managing all type of law and order situations.

Financial model adopted
- No cost to the beneficiary
- No cost to the Department for Solution development as NIC Haryana is providing all ICT resources and notional cost to NIC is Approximately 30 lacs per annum is Notional cost of the project born by NIC.
- Banks for providing obligatory services of enrollment and opening of accounts of beneficiaries. However, banks are being paid Commission by state Govt. as per the RBI norms.
- Minor cost towards procurement of development tools and hardware etc is born by the Deptt.

Additional efforts to ensure sustainability of the e-Governance initiative(s)
- The State Govt. has done third party assessment at its level and found the services delivery to the satisfaction.
- Keeping in view the nature of the project, no additional efforts have been made as such because No cost burden on the beneficiary. Because it is treated under the category of Social welfare.

Technology
Technological solution adopted
- So far, ICT resources of NIC Haryana are utilized for solution development, testing, hosting and implementation. The IT cell in the premises of user Department is under establishment. MS SQL server 2012 is utilized for database handling and business logic is developed in the .NET framework version 2.0/4.0 on Windows platform. Solution is hosted on IIS server. No maintenance burden on the department, yet. Solution is compatible with NeGP standards as it could run on SWAN also. Department is planning to shift the website to State Data Centre.

Security and confidentiality standards planned
- Application level security features namely, user-ID/Passwords, Authentication, Hashing/MD5 techniques of passwords, encryption of data and client-server side validation checks, protection from SQL injections have been incorporated. IP based access of the website on the Network made it more secure. Moreover, the application is hosted on NIC's server located in IDC at NIC HQ New Delhi, which is highly secure having latest security features inbuilt.

Strategy planned for Disaster Recovery and service continuity
- Since the application is hosted in at NIC data centre and the NIC, IDC are complying the standard web policy of Govt. of India, therefore all issues relating to data security and Disaster Recovery are well addressed. To our knowledge the offsite online backup is also created.

Impact and value-addition thru adaption of Social
- Different kind of medium is used for promotion of project and to spread the awareness. Advertisements and press notes have been published in newspaper, screens have been shared with local cable operator throughout the state, and pamphlet has been distributed in multiple gathering of concern people. Workshops have been conducted for root level users for training in which they are instructed to make awareness among the beneficiaries. Also with the help of Department of Public Relations project has been promoted across the state.

VALUE INDICATORS
Digital Inclusion
- Different approaches have been implemented to provide access to digitized information to concern user and beneficiary. District level officers are trained in software operations by NIC for updation of beneficiary data online, similarly other staff member of department are also trained about dynamic website so that they can educate any person who is at grass root level to get any related information from digitized data through website. A secure web account has been given to all stakeholders to process the data as per their role and to access the information at any time. The project database of beneficiaries is **bilingual**, i.e Hindi and English. Banks are comfortable with English and beneficiaries are comfortable with either language. Each and every village/MC is covered under the project, and benefits are delivered to all on the same pattern. No constraints of demography.
- District level functionaries have connectivity through NIC /BSNL.

Green e-Governance
ICT facilities created under the project are taken care of **Green e-Governance** to the extent possible i.e.
- **No e-Waste** has been created except used printer ribbons, toner cartridges & UPS batteries which are sold for re-use or recycling purpose.

- Another method of e-waste treatment namely Incineration (burn) or Land filling are not required to be used due to negligible e-waste generated out of the system.
- The obsolete P4 – computer machines are being utilized for other word processing tasks.
- A lot of paper, resources and energy savings due to Electronic Banking Transfer (EBT)/DBT.
- To save towards resources and power, the existing ICT facilities like Data Centre of NIC are shared.

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Supply Chain Management
Commissioner of Civil Supplies
Government of Telangana

Rajat Kumar, Shivaji and Vijay Mohan

PROJECT OVERVIEW

Supply Chain Management is an online application developed to track the movement of stocks from FCI (Food Corporation of India) godowns / Buffer godowns to Mandal Level Stock (MLS) points and Dispatch from MLS points to the door steps of Fair Price Shop (FPS) Dealers. The key objective of this application is to ensure the availability of stocks at every level to process the flow of stocks from godowns through FP shops for regular distribution of essential commodities to the FSC beneficiaries and reduce the time and effort for data consolidation. SCM is comprised of major modules such as Stock movement from FCI, Stock movement from Buffer Godowns, Stock movement from Suppliers, dispatching at MLS points, ROs for other institutions and MIS Reports.

FCI (Food Corporation of India): Commissioner of Food & Civil Supplies will distribute the commodities (Rice & Wheat) among all the districts of Telangana as per the given details in GOI letter and it is further followed to FCI GM. FCI GM will generate the off-take order to VC & MD for proceeding the allotment order. DM sends an e-Request to FCI AM for generating the Release Order for issuing the stock from corresponding FCI godown. FCI DM will issue the stock from FCI godown to destination MLS point.

Buffer Godowns: Buffer godown stock movement will be initiated with a request from DM to DCP DM. Based on the e-request received, DCP DM will issue a delivery order to buffer godowns for issuing the stocks to MLS point. Upon receiving the delivery order, godown incharge will commence the stock transfer to destination MLS point through trucks.

Suppliers: Other commodities such as Sugar, Redgram Dal, Salt, etc., will be distributed through suppliers. VC & MD will issue a Supply Order for supplying the other commodities for all the districts. Upon receiving the Supply Order, DM will generate the movement order to MLS points to receive the commodities from the respective supplier provided in the supply order details.

MLS point: Major and very important operations are carried out at MLS points. MLS point incharges will enter their commodity wise opening balances according to the stock they have, when they start using the application for the first time. Receipts (Stage-1) from FCI, Buffer godowns, Suppliers and also seized stocks are acknowledged at MLS points. Issues (Stage-2) for FPS shops and institutions are
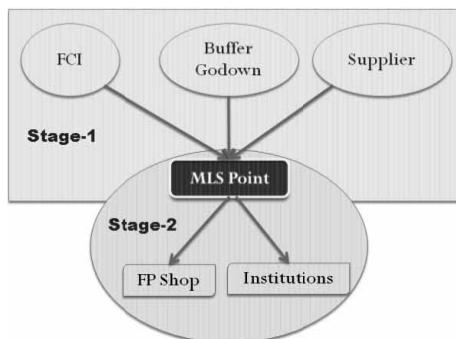
Figure: SCM App

carried out in above figure. Supply Chain Management based on the Closing Balances available at the time of dispatching.

Buffer Godown: Similar to MLS points, stock receipts and issuing operations are carried out at buffer godowns. Buffer Godown incharges will enter their commodity and season wise opening balances according to the stock they have when they start using the application for the first time. Then they can update the receipts and issues details. Considering the OB, receipts and issues of the current day, closing balance of each commodity is calculated and the same is treated as OB for the next day. Everyday commodity wise closing balance will be calculated through a backend DB function.

Stake Holders of SCM

Commissioner: Commissioner of Food & Civil Supplies will distribute the commodities (Rice & Wheat) among all the districts of Telangana as per the details given in GOI letter and freezes the allotment order and further it is forwarded to FCI GM as well as VC & MD.

GM PDS: GM is the authorised person to add / update purchasing rate per unit for the commodities such as APL Rice, BPL Rice, AAP Rice, AAY Wheat, etc. Also the GM overview the MIS reports for monitoring the status of stock transfer from place to place.

FCI GM: FCI GM will endorse the data that is forwarded by commissioner and send the copy to VC & MD.

VC & MD: VC & MD will verify the allotment order from Commissioner and generates the allotment proceeding number and forward to all DMs. Adding Suppliers, generates a supply order for the movement of other commodities such as Sugar, salt, RG dal, etc., does OB updating for MLS points and godowns in case of wrong entry, add the commodity rates for institutions.

DM: DM sends an e-request to FCI Area Manager using allotment proceeding number generated by VC&MD for generating release order, generates request for DCP DM for stock movement from buffer godowns to MSL points, can initialize the inter district stock movement (Transfer-IN & Transfer-Out flow) for both MLS points as well as godowns, generation of movement orders for the supply order generated by VC&MD for receiving other commodities at MLS points, generate and approve manual ROs for other institutions. Along with these DM is also responsible for creating masters such as godowns, contractors, technical assistants, institutions and updating millers from DCP. DM also does user creation for roles MLS point Incharge, godown Incharge.

FCI AM: Area Manager will receive commodity wise Request Numbers submitted by District Manager. Based on the requested quantity FCI Area Manager will generate the release order and forward the same to FCI Depot Manager to transfer the stock.

FCI DM: FCI Depot Manager receives the RO No. from Area Manager, generate the truck chit and dispatch the stock to destination MLS point.

MLS point Incharge: MLS Point Incharge entered the OB for one time, acknowledge the receipts from FCI, buffer, supplier and transfer-in. Dispatch the stock to Fair Price Shops provided FPS dealers should have made payments for the Release orders at eSeva and the same must be approved my ASO/TAHR. Dispatch commodities to other institutions based on the ROs approved by DM / MRO. Transfer-Out activity to transfer stock to other MLS point is carried out based on DM movement order. MLS point Incharge can know their stock position; CBs every day by referring to Stock register option.

DCP DM: DCP DM generates delivery order to buffer godowns upon receiving the request from DM for dispatching the stock from godowns to MLS points.

Buffer Godown Incharge: Godown Incharge will enter the OB for the first time and enter the receipt details upon receiving stock from DCP millers in manual receipts option. Then, issue the stock to MLS Points as per the details given in the delivery order generated by DCP DM.

RESULT INDICATORS
Key Performance
Online Allocation: Generation of Allotment orders for stock movement from Food Corporation of India (FCI) / Buffer Godowns / Suppliers to MLS points is completely online.

Online Release Orders: FCI Release Orders for Stock transfer from FCI godowns, eSeva Release Orders for the stock lifting from MLS points to FP Shops, Institutional ROs for other institutions are also generated online.

RO Date Extension: In case of delay in lifting the stocks on institutional ROs, Date extension option is provided for institutional ROs.

RO Refund: In case of any discrepancy in lifting eSeva ROs such as issuing the wrong commodity, then the respective RO can be refunded and the FPS dealer can again get a new RO for lifting the required commodity.

SMS to the users: An SMS of stock dispatched will be auto-generated and sent to the respective MLS point Incharge, FPS dealers, Inspectors, beneficiaries associated with the FPS and task force officials.

Public Domain Reports: Reports such as MLS stock position, receipts, issues and Godown stock position, receipts, issues as a whole and no. of districts along with district codes, no. of MLS points, godowns with codes, user name as well as addresses are in public domain.

Masters
- *Godown Master:* Godown types included in this project are SWC, CWC, AMC, PVT Godowns, over 210 different types of godowns available. We are maintaining their Closing Balances by calculating receipts, issues through the scheduler.
- *Suppliers:* Suppliers are the stakeholders which they provide commodities like wheat, sugar, red gram dal, salt etc. For this, the movement of stocks start from Head Office by requesting them desired quantities through online. DMs will get allotments from Head Offices and those were forwarded to the MLS points.
- *Contractor Master:* Contractors are two types of, those are stage-1 contractors, who undertakes contracts from FCI and the others are stage-2 contractors who purchases stocks from TS marketing authority.
- *Technical Assistants:* Technical Assistants are the user, who works at every MLS point and Buffer Godowns.

Benefits obtained
- Closing Balances of MLS points and godowns are monitored online from time-to-time. Hence the stock position is maintained accurately.
- Stock diversion is controlled to some extent by online regulation.
- Authorized operations by digital signing: Various important operations such as generation of release orders, adding or updating rates for commodities, etc., are carried out using digital token signing.
- In-time movement of stock to beneficiaries by dispatching stock from MLS point to FPShops (Stage-2).
- Online process reduced time consumption and manual work

Year-wise transaction volume
eSeva ROs
No. of eSeva ROs generated for 10 districts of Telangana state in the month of September, 2016.

Table: ROs generation at different districts

Sl. No.	District	No. of FPS.	No. of RO's
1	Adilabad	1437	1587
2	Nizamabad	1333	1383
3	Karimnagar	2112	2134
4	Medak	1845	2108
5	Hyderabad	856	2123
6	Ranga Reddy	1848	2032
7	Mahbubnagar	2311	2365
8	Nalgonda	2080	2217
9	Warangal	2115	2145
10	Khammam	1188	1204
Total		**17125**	**19298**

Institutional ROs

Release Orders for other institutions such as MDM Schools, Tribal Welfare Department, NGOs, Social Welfare Dept., BC / SC / ST Welfare Dept. and etc., are generated and approved online using digital signatures of September, 2016.

Table: ROs generation at different institutions

Sl. No.	District	No. of FPS.	No. of RO's
1	Adilabad	4361	1515
2	Hyderabad	97	37
3	Karimnagar	3839	1226
4	Khammam	3387	2105
5	Mahbubnagar	1724	27
6	Medak	3520	1710
7	Nalgonda	4230	2541
8	Nizamabad	2759	2325
9	Ranga Reddy	3053	2411
10	Warangal	2942	663
Total		**29912**	**14560**

Implementation coverage

Supply Chain Management is being operated across the entire Telangana State.

Districts of Telangana State	:	10
Mandals	:	467
MLS points	:	171
Godowns (AMC, CWC, SWC,etc.)	:	95
FP Shops	:	17, 494

Online Institutional ROs: Institutional ROs are being generated online by District Managers And MROs using Digital token signature. Monthly more than 20,000 ROs are being generated in across all the districts.

Wrong entry deletions: The wrongly dispatched ROs / duplicate entries of receipts in MLS points can be deleted by District Manager using Digital Token Signature; further the Closing Balance is updated by the system to maintain the stock position at every point of time.

ROs Refund: If the ROs are partially lifted and the paid amount of remaining un-lifted RO, that has to be refunded to the FPS dealer. This option is provided in MLS point login. The process to refund an RO is initiated by MLS point Incharge and it is then forwarded to Tahasildar and further forwarded to DM for approval. DM will approve the RO to be refunded with the details of refundable amount.

Stock Loss / Gain: Apart from the regular receipts and issues, the stocks of MLS points or buffer godowns will be raised or deducted by the seizing of PDS commodities at Fair Price shops or MLS points or any other place. Also there can be deduction in stocks due to storage loss / damaged stock, etc.

Outcomes in terms of Efficiency, Improvements and integration

- Stock diversion is controlled by generating truck chits and sending SMS alerts to appropriate user.
- With the use of digital token, reduced the misuse of the application.
- Closing Balances of commodities at MLS points and Godowns can be accessed at any time.
- In-time movement of stock to beneficiaries by dispatching stock from MLS point to FPShops (Stage-2).
- Truck chits, gate-pass, release orders are generated online.
- Manual RO's for other institutions such as Mid-Day Meal schools, Women & Child welfare associations, BC Hostels, Tribal hostels, NGOs (Orphanages, Old age homes) and other 20 institutions are generated online.
- In every month to complete the allocation to FP shops and to fulfil the PDS requirement, all the stocks as per the required quantities must be cycled from FCI / buffer godowns to MLS points and dispatch from MLS points to the door steps of Fair Price Shop (FPS) Dealers.
- 12678 Metric Tons of rice for each month is saved
- Rs. 30.87 Crores of Savings in subsidy is being achieved monthly.

Digital Token validation / Digital Signature: For secure and authenticated operations digital token signing is made compulsory. Digital Token has to be used in:

- Institutional RO Generation at DM and MRO levels.
- Delete wrong / duplicate entries of Stock dispatching or RO generation.
- To Add / Update commodities rates at GM PDS Level.

Online Release Orders: All the allotments for dispatching at MLS point, release orders for institutions, delivery orders for stock dispatching at godowns are generated online.

Truck Chits / Gate-Pass: Truck Chits for lifting at godowns / MLS points and acknowledgment at MLS points are generated by system automatically.

SMS: Once the stock is dispatched at MLS point, an SMS will be auto-generated and sent to the respective MLS point incharges, FPS dealers, beneficiaries associated with the FPS and task force officials.

ENABLER INDICATORS
Process reengineering
Online allotment: Commissioner of Food & Civil Supplies will distribute the commodities (Rice & Wheat) among all the districts of Telangana as per the details given in GOI letter and freezes the allotment order and further it is forwarded to FCI GM as well as VC & MD.

Release Orders: For other institutions such as MDM schools, BC welfare hostels, Women and Child welfare societies, NGOs, Jails, etc., DM / MRO will generate and approve the Release Order. MLS point incharge will dispatch the commodities to institutions based on the details provided in the RO and stock availability.

Refund eSeva ROs: This is one of the major features in SCM. If the ROs are partially lifted and the paid amount of remaining un-lifted RO, that has to be refunded to the FPS dealer. This option is provided in MLS point login. if there are any such ROs, that RO is refunded by MLS point incharge and it is then forwarded to DM. DM in ePDS login will approve that RO using digital token in order to refund the remaining amount in FPS dealer.

Inter-District Movement: There may be a requirement of stocks to be distributed among the districts. So, the districts that require stocks after the consumption of allotted stocks, an indent will be forwarded to VC * MD for stock movement from other districts where the stock is available. This movement begins with an indent from request DM to VC & MD through the Delivery Order from DCP DM to source Godowns and finally the stocks are transferred from source godown to destination godown through road ways or railways.

Truck Chits: For every dispatch at MLS point and godowns, acknowledgement by MLS point and godowns a truck chit is generated by the system. Ex: Truck chit for a dispatch in MLS point:

Challenges faced in implementing Process changes
- Monitoring of off-take and Closing balances
- Challenge to distribute essential commodities to NFSC beneficiaries regularly & in time every month.
- In every month to complete the allocation to FP shops and to fulfil the PDS requirement, all the stocks as per the required quantities must be cycled from FCI / buffer godowns to MLS points and dispatch from MLS points to the door steps of Fair Price Shop (FPS) Dealers.
- 1.80 Lac Metric Tons of Rice
- 8,946 Metric Tons of Wheat
- 4,513 Metric Tons of Iodized Salt
- 4,469 Metric Tons of Sugar, etc.
- Per each month 90.56 Lac Card holders covering 286.37 citizen.
- Maintaining balances throughout the inter-district movement.

The Lessons learnt from the Process re-engineering exercise
Transformative Leadership exhibiting the realities of purposeful, progressive and visionary governance is a critical driver to implement changes. Food and Civil Supplies department has learnt the significance of leadership as driving force to change existing moribund process and introduce efficient processes (GPRs) and hence successfully driven the change through exemplary leadership.

"If you cannot measure it, you cannot manage it": Evaluating the progress of the implementation, needs constant monitoring and surveying. Food and Civil Supplies department has successfully learnt the saying by developing the reports in all the levels such as Commissioner of Food & Civil Supplies, VC & MD, DM, ASO / Tahsildar, MLS point Incharge, Godown Incharge, etc., for monitoring the SCM application on various aspects like MLS points stock position, godowns stock position, Institutional ROs – generated / lifted / unlifted, etc., drilled down from state level to ground level.

Best practices adopted from the industry

Digital Signatures: Digital token is a physical device that an authorized user of computer services is given to ease authentication. Only authorized user can be access to account. The main advantage of this token is, we can control manipulation by the third parties. We use Digital Token in SCM for the below operations:

- Institutional RO Generation at DM and MRO levels.
- Delete wrong / duplicate entries of Stock dispatching or RO generation.
- To Add / Update commodities rates at GM PDS Level.

Change in digital token of a user can be updated by their high level authority for carrying out the respective operations smoothly. DMs digital token details can be updated by GM and MROs digital token details can be updated by respective DM.

Integration with ePDS and ePoS: ePDS- With integration of ePDS and SCM, ROs paid at TS online, MeSeva and Eseva centres will be sends for the approval to MROs through this application. At that stage MROs forward those ROs to their corresponding MLS points, here stocks are dispatched based on that RO to the Fps dealers. For each month minimum 22,000 are being generated. *ePoS-* RO wise dispatched quantities will be sent to Fps dealers by with the integration of ePoS application using web service. We can monitor these stocks from ROs paid at online to ROs quantity dispatched to card holders without single unit loss.

OB Schedulers: Closing Balances at every MLS point and buffer godowns will be calculated at the end of the day by taking their opening balance quantity, receipts received and issues done.

<div align="center">

CB = opening balance + Receipts – Issues.

CB of the current day is treated as OB for the next day.

</div>

SMS: Once the stock is dispatched at MLS point, an SMS will be auto-generated and sent to the respective MLS point incharges, FPS dealers, beneficiaries associated with the FPS and task force officials.

- *SMS Format:*   MLS Point: MlspointCircleIx,
  Opp. GandhiHospital, SWCMusheerabad
  Truck No.: AP328248
  FPS / Institution: 1679908
  Address: 1-11-302,Bhagavanthpur, Begumpet
  Rice: 13.0Qtls.kgs
  Date: 2016-07-25 18:30:01.328

Leadership, Change Management, Capacity Building

Leadership support for the initiative

- Food & Civil Supplies department played a key-catalysing role in the entire process. It evolved the concept, became the main implementer and technology partner. Once the ball was set rolling, the sceptics also joined the band-wagon and success was achieved.
- Food & Civil Supplies Department has collaborated with National Informatics Centre (NIC), Hyderabad to implement and organize trainings to all the users of various levels (MLS point In-charges, Godown In-charges, department officials, etc.,) on SCM application. Several training

programs and meetings conducted for various levels for effective implementation of project by training the uses and gathering gaps information (if any) and fulfilling them on time-to-time.

Change management and Capacity building strategy

Change management was a major issue and was handled sensitively, involving all the stakeholders like the officials, their Employees Associations. FOOD & CIVIL SUPPLIES department has adopted strategic approach to train Government employees through repetitive and interactive training sessions to use the system without reducing their perceived importance in the entire administrative set up.

Project management & Monitoring

SCM is developed by full-time program management team at National Informatics Centre (NIC), Hyderabad. The team consists of Technical Director, Sr. System Analyst, 1 Senior Programmer, 2 Junior Programmers and PMIT of Food and Civil Supplies Dept.

Financial model adopted

Total funds for the development of SCM project are received from the Government of Telangana.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Sustainability is about ensuring solutions are "built to last" and are able to function efficiently over a long period of time. The goal of sustainability is to establish local economies that are economically viable, technically sound and socially responsible. This section presents information from a variety of sources on approaches and techniques used to successfully develop key aspects of their local economies on a sustainable basis.

Modularity with respect to functionality, re usability by the use of various common objects made the software scalable to all the 10 districts of Telangana State. Various state wise abstracts and reports on this massive data was made possible by use of functions, materialized views which are scheduled to be executed once in a day when the load averages on the system are low (at midnight).

Challenges faced in transition

Low ICT Awareness among the key stakeholders has been a great obstacle to the Change envisioned. Raising IT awareness among key stakeholders: training to MLS point incharges, godown incharges, DMs, MROs, other government officials, etc., had led to effective utilization of the SCM application and in successful implementation/operations of SCM.

The Lessons learnt from Change Management and Capacity building

Efficacy of Capacity building: Capacity building has become dominant subject with the advent of SCM. During the driving phase of the capacity building initiative, leads are assigned, accountability is established, action plans are developed, and project management units are utilized. It was learnt from the past experience that the domain experts, too, play a vital role in making the exercise a complete success. Hence the criteria of involving domain experts was identified and applied to enhance the

effectiveness of the capacity building initiatives. Once the driving stage has reached fruition, constant monitoring of the capacity building initiative has been setup.

Technology
Technological solution adopted
The entire solution is hosted in a state of art State Data Centre with a robust infrastructure. As the developed system is a web based one, deployed at a central location, it is easily accessible by all the stakeholders, anytime and anywhere.
Software development & maintenance and System Administration – By NIC.
Servers, Network, Hardware – State Data Centre (SDC)
Help Desk – Civil Supplies Department

Compliance of the Technology adopted with e-Government standards notified
The entire ownership of the data vests with the Department itself. All the data is located in co-located Departmental servers in a highly secured environment in SDC, where all the Security policies are under implementation.

Technology related challenges
SCM is now fundamentally changing the delivery systems to distribute the commodities to the beneficiaries. It is very crucial to maintain the Accessibility, Availability and Scalability of the systems. Some of the challenges faced with FSC are as below:
- Monitoring of stock positions at MLS points and godowns on timely basis.
- In-time stock dispatching to the FP Shops and other institutions.
- Providing multiple real-time MIS reports at various levels.
- Conducting training sessions to various levels of officials about the utilization of the application and perform their responsibilities in the same.

The Lessons learnt from Technology choices and implementation strategy
SCM is a JAVA based web application with Postgre SQL as the backend. The project holds a lesson that thorough preparatory work is important to avoid mishaps or breakdowns in service delivery, availability and updating of accurate data, adherence to service delivery timelines, monitoring the performance & dynamic evaluation from time to time. Following are some of the lessons learnt during SCM implementation:
- Monitoring the server enormous number of hits.
- Request data is being updated after completion of transaction (posting through batch mode with single connection) to avoid high traffic on client server, which has reduced transaction time and transaction failures.
- Temporary tables were used to avoid load on the server while accessing various MIS Reports by officials. This avoids accessing live tables for report generations.
- Web-services have been deployed to connect to ePoS (electronic Point of Sale) to reflect the lifted ROs in ePoS device.
- Online tracking facility is provided by MIS reports to monitor the stock position and movement in a transparent and easy manner.

VALUE INDICATORS
Digital Inclusion
Digital Token Signing: For secure and authenticated operations digital token signing is made compulsory. Digital Token has to be used in:

- Institutional RO Generation at DM and MRO levels.
- Delete wrong / duplicate entries of Stock dispatching or RO generation.
- To Add / Update commodities rates at GM PDS Level.

Green e-Governance
The entire process is online, saving the papers used for government approval process for delivery of various services.

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Amma Land Records – Online Mutation for Title Transfer
Department of Survey and Settlement, Government of Tamilnadu

Jatindra Nath Swain and V. Ponraj

PROJECT OVERVIEW

AMMA Land Records is an e-service provided to the Public by the Department of Survey and Settlement of Government of Tamil Nadu for online processing of Title transfer of land properties and for online measurement of Land Records. For this purpose, Land Records, numbering around 3.5 crore have been computerised and brought online through Web-based Tamil NILAM (Tamil Nadu Info-System on Land Administration and Management) software developed by the National Informatics Centre (NIC), Chennai. The e-services have been hosted for public at "http://eservices.tn.gov.in".

Objectives of this project are

- Develop an IT enabled platform to pursue online management of land records.
- Online Title Transfer through mutation.
- Provision of digitally secure / QR coded RoR – anytime anywhere.
- Enable easy access for public to land related services.
- Fix accountability & enable transparency in delivery of e-services.

Strategy adopted
Development of Web-based Software

- The basic land records pertaining to rural areas viz., 'A' Register and Chitta were computerized during the years 2000-2002. Maintenance of land records was being carried out using a software developed by NIC called 'Tamil NILAM' in all the Taluk offices (except those in Chennai District – where the Urban Land Records, were in different format and were not computerized at that time). The computerised land records were being processed in stand-alone manner, i.e., data pertaining to each Taluk was processed and stored in the local server available in the respective Taluk Office.
- In the year 2008, an e-service called 'Anytime Anywhere Land Records' was launched wherein, data from the Taluk Servers were uploaded to server in Chennai and was hosted at the portal 'http://eservices.tn.gov.in' for public viewing.
- At that stage, due to connectivity issues data of some Taluks could not be updated on daily basis in the e-service Server. Because of this, the latest data could not be provided to the public.
- Since data was maintained in stand-alone manner in Taluk servers, changes in the Software (Tamil Nilam) had to be communicated to the Taluk servers for updation. In other words, modifications to Software had to be done in the Taluk Servers individually. Also, consolidation of information on land records at state-level could not be done in one go.
- Therefore, a dynamic database with Web-based online interfaces was the need of the hour.

- Since the stand-alone Software for land records namely Tamil NILAM was already available, it was decided to convert the existing Software into Web-based. In other words, it was decided 'Web enable Tamil NILAM' and to port the data from all Taluks to the Central Server.
- Hence, Software Requirements Specification (SRS) document was prepared through NIC and got approved at the State Level Monitoring Committee of NLRMP (National Land Records Modernization Programme).
- Web-based Software was developed through NIC with consistent monitoring & feedbacks by the team of officials of this Department.
- In the meantime, Servers were commissioned at the State Data Centre, Perungudi, Chennai for hosting the Land Records.
- A Special Drive for Verification and Updation of Land Records was conducted during July-2014 to Oct-2014 in all the Taluks (except those Chennai) to eliminate errors and also to update the Land Records to the current date. Through this massive exercise, error-freeness of the Taluk data was ensured before they are brought online.
- Under the 'Special Drive for Verification and Updation of Land Records', around 25 Lakh data entry errors were removed from the Tamil Nilam database. Also, many instances of 'A' Register entries of private names appearing on Poramboke lands were removed thereby saving huge area of Govt. Poramboke lands from being mishandled by land grabbers.
- After innumerous demos, discussions and testing, implementation of the 'Web-based Tamil Nilam' Software was commenced on pilot basis in Perambalur Taluk on 09.11.2014.
- Then, the task of porting the data of all the remaining Taluks online and also to fine-tune the software for bugs became hectic. Meetings were conducted with all levels of District / Taluk Officials and training programmes were conducted for all levels of staff of both Revenue and Survey Departments.
- Progress of the work was closely monitored and instructions were issued to District Collectors / District Revenue Officers/ Assistant Directors of Survey and Land Records.
- The task of porting the data to the Web-based System essentially involved the following steps / activities.
  - Verification and elimination of errors from the data base suing Correction Software.
  - Conversion of data into Unicode font.
  - Porting of data to the Central Server.
  - Elimination of conversion errors from the data.
  - Bulk-signing (with Digital Signature) of error-free data by the Tahsildar.
  - Bringing the Digitally signed data for online usage.
  - Providing user credentials to all officials who have user roles.
  - Resolving the issues related to data accessing.
- Srirangam Taluk was brought online on 01.07.2015. Subsequently, in the year 2015 itself 126 more Taluks were brought online.

- As of now, 276 Taluks (267 Rural Taluks + 9 Urban Taluks) have been brought online, using the Web-based Software.
- Software modules for integration of databases of Registration and Tamil Nilam have been developed. The Web Services for transferring Registration data to the Land Records Software will be commenced shortly.

RESULT INDICATORS

- The web-based system has replaced the manual title (Patta) transfer system in 276 Taluks. Feedback received from the public as well from the officials indicates that the new system has been a grand success.
- As a testimony to the success of this project, 'Best Practices Award' for the year 2016 along with a cash reward of Rs.2.00 Lakh has been awarded to this department by the Hon'ble Chief Minister of Tamil Nadu in the 70th Independence day celebration held on 15.08.2016.
- Around 10 Lakh applications seeking Title transfer have been received from the public through this system in the last one year and out of these, around 7.5 Lakh applications have been disposed so far.This volume of transaction within a period of around one year simply shows the massive of public support it has achieved.

Key Performance

Benefits to Public:

- Reduced processing time for applications and higher productivity.
- People can apply online for Patta transfer through Common Service Centres (CSC).
- They can view the status of their applications online.
- SMS will be automatically sent to the applicants on approval of Patta / rejection of applications by Tahsildars / Deputy Tahsildars.
- Digitally signed & QR coded RoRs can be downloaded anytime from anywhere over the internet.
- Since the need for going to Taluk offices will be avoided, malpractices can be reduced.

Benefits to Officials:

- Since the entire system of workflow has been computerized, the officials will find it easy to perform their routine duty.
- Officials can work in a new-look IT environment.
- Higher officials can closely monitor the status of work on line. They can analyze the pending applications any time and issue instructions wherever necessary.

Implementation coverage

- Using this e-service it is proposed to cover the entire State and transactions related to all types of Land Records.
- Presently, this has been successfully implemented in 276 Taluks (267 Rural Taluks + 9 Urban Taluks) out of 285 Taluks in the State. Action is being pursued for covering the remaining 9 Taluks also.

Outcomes in terms of Efficiency, Improvements and integration

- Earlier, in the manual system, Landowners have to come in person to Taluk offices and file their applications for transfer of registry or for getting copies of Patta / 'A' Register.
- Under the present system, they can apply for Patta transfer in anyone of the Common Service Centres (CSCs) available across the state. This 'apply online from any CSC' apart from giving a new dimension to the process of getting patta virtually from anywhere in the state, also saves precious time and effort of the landowners. Further, as they have no need to come to Taluk office for this purpose, the chances of malpractices can be reduced.
- SMS will be sent to the applicants on receipt of applications, and on approval/ rejection of application by Deputy Tahsildar / Tahsildar.
- Digitally signed, Q.R.Code embedded Patta (RoR) is made available under the e-Service "Anytime Anywhere" at 'http: //eservices.tn.gov.in'.
- By scanning the Q.R Code on their Patta using their Mobile, public can easily ascertain the genuineness of the Patta.
- Presently, the landowners can obtain their hardcopy of Patta from the CSCs or they can download softcopy of Patta in pdf format from the e-Service portal "Anytime Anywhere".

ENABLER INDICATORS

The Key enablers in our project are:

- Business process reengineering
- Change Management, Training and capacity building
- Technology adaptations/ Innovative deployment
- Creation of infrastructure in all Taluk Offices and at the State Data Centre.
- Creation of public awareness.

Process reengineering

Simplified Procedures

- The work flow has been simplified in the online system. Hence, the Survey and Revenue department are able to easily understand and use it.
- Processing time has been reduced as the records are transferred online from one official to the other in the work flow.
- Public can approach any CSC in the State to apply for patta transfer online.
- Printed acknowledgement will be provided to them at the counter itself.
- All the officials can process the applications through computers / laptops and pass it onto the next level in the hierarchy.
- Productivity has increased as officials can now process the applications online without having to physically transfer the files.
- Web Services for linking Digitized of FMS with web-enabled Tamil Nilam. Therefore, sub-division of Land parcels can be done through computers using Collabland Software and the sketches created can be approved through computers by Tahsildar.
- Pattas (RoRs) approved by the Deputy Tahsildar / Tahsildars will be sent by email to the applicants.

- Also, the applicants can view the current status of their applications through internet.
- The Web-based system provides complete transparency to the Land Records Management since the entire work flow has been computerised.
- Log for each and every activity performed by every official using this software is maintained. This will provide greater accountability.
- Applicants can view the processing status of their applications online.
- Higher officials can view the pending status of application online and conduct review.

Innovativeness of the initiative and its replicability

- This Web-based system is comprehensive such that more modules can be added to it to facilitate expansion modules for the following will be added shortly.
- Home / Tenements' Land Records
- Field Measurement Sketches
- Land Reforms / Land Administration activities.
- Integration of Land Records database and Registration Department's database facilitated to ensure automatic flow of registration details of landed properties to land records database to achieve automatic mutation.
- Provision for seeding of 'Aadhar Number' of the land owners in the database.
- In order to bring the e-Services of Land Records on Mobile platform, a Mobile App "AMMA (Access & Manage through Mobile from Anywhere) e-Service of Land Records" has been developed.

Leadership, Change Management, Capacity Building during transition

- The Department of Survey headed by the Commissioner of Survey and Settlement. Tmt. R.Vasuki, I.A.S., performed exceedingly to achieve the above results. The COSS has set up a team of officials comprising of the Additional Director of Survey, the Joint Director (Computerisation & Training), the Joint Director of Survey and the Regional Deputy Directors to inspect the implementation of the above initiatives and to closely monitor them. The COSS personally attended to the discussions with software development agency viz., NIC and with District Collectors to expedite the programme and guided them in every step.
- Dr.Girija Vaidyanathan, I.A.S., ACS/CLA and Thiru. Gagandeep Singh Bedi, I.A.S., (formerly Secretary to Govt. Revenue Dept.,) presently, Agricultural Production Commissioner and Secretary to Govt., guided the officials, especially, encouraged all the District Collectors in achieving the above goals.
- Thiru. S. Nagarajan, I.A.S., presently Director of TNeGA, Thiru. Darez Ahamed, I.A.S., (formerly District Collector, Perambalur) and Thiru. P. Madhusudhan Reddy, I.A.S., (formerly Sub-Collector, Perambalur) presently JC (LA) have excellently coordinated with COSS in implementing the Online Patta Transfer Scheme.

- Thiru.P. Krishna Prasad, Deputy Director General and State Informatics Officer, and the NIC-Chennai's team comprising Tmt. Geetharani, Tvl. Stephen C Amirtharaj, K. Sundar, J. Rameshkumar and others have relentlessly supported the project and well coordinated with the officials of this department.
- Since successful implementation of any programme is in the hands of the officials concerned, it was essential to impart training to all the officials of the Revenue and Survey departments in adapting themselves to the new system. Training was conducted at all levels, viz. Taluk, District and State levels. The training included basic level training like how to use laptops to advanced training on how to use the web-base application and process applications.

Technology
- Software environment of the project deployed
    - APACHE CXF – Restful Web Services with AJAX.
    - Open Technology using HTML5 / CSS3 with Pouch DB (for local storage).
    - CAS Server Integration for Single Sign on.
    - J Query, JSON.
    - Digital Signing.
    - Postgre SQL Database.
    - JOD Converter with Open Office for PDF conversion.
- Maintenance of Software and System Administration are taken care of by National Informatics Centre, Chennai.
- Maintenance of Hardware & Networking are taken care of by: Electronic Corporation of Tamil Nadu (ELCOT).
- Day to day user-level Operations.
- Completely Open Source Software environment.
- The Web-application has been installed at the State Data Centre at Chennai, which is highly secured.
- It uses State Wide Area Network for connectivity, maintained by ELCOT.
- Backup policy and retrieval mechanism are taken care of at the State Data Centre, by ELCOT.

VALUE INDICATORS
- The Web-based System has been developed and maintained by a Central Government department (NIC). Hardware at the State Data Center and the Network throughout State are maintained by ELCOT, which is a GoTN's agency. Hence, consistent support for Software and Hardware has been ensured.
- Presently applications from the public under this eservice are being received through Common Service center established and monitored through Information Technology department of State Government.
- Soon receipt of application from the public will be shifted to completely online mode i.e. land owners can applied for Title transfer from their homes through internet.

Digital Inclusion
- All the particulars of Land Records have been stored in Tamil Language in the Database.
- The Web-based Software's User Interfaces are also in Tamil.

Green e-Governance

Since all the processes with respect with respect of processing Title transfer applications have been shifted to online mode. Paper consumption has been largely reduced, Green e-Governance is already in place.

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Shri V. Ponraj, *Joint Director (Computerization & Training), dir-sur@nic.in*

Core Treasury System (e-Kosh)
Directorate of Treasuries, Pension & Entitlements, Department of Finance, Uttarakhand Government

L. N. Pant and Narendra Singh Negi

PROJECT OVERVIEW

Core Treasury System (EKOSH) web portal is designed and developed to provide user interface to various users of treasury and finance department in the state. This portal provides real time financial transactions of State Government performed at 86 Treasuries/Sub Treasuries connected through dedicated lease line across the state. Department of Finance, Treasuries, Secretaries, Head of Departments, DDO's, CCL/PLA Department, Finance Controllers, Bankers, Employees and Pensioners can get instant information through internet by using their login and password. This will help more than 4200 DDO's, 400 CCL/PLA users to prepare Online Bills/E-cheque/Online Pension Papers of the state & to reconcile the receipt and payment details with treasury figures & Accountant General in single click.This portal facilitates online budget distribution and surrender by 68 Secretaries & 120 HODs including Contingency, District Plan and TR24 budget, they will be benefited to get their grant/scheme wise progressive expenditure / Budget details.

This Portal also provides facility for online salary generation and payment for various autonomous bodies of state Government (Universities, Aided Institutes, Nagar Palika) along with E-Challan facility for E-Reciepts and E-Praman for Digital Life Certificates for annual verification of Pensioners.

RESULT INDICATORS
Key Performance

- Monthly Pay slip & Annual Statement for last 5 years is available on the portal for all employees (2, 50,000) and pensioners.
- Online Income tax Calculation facility is available to all employees/pensioners.
- DDO can online generate all required reports such as Monthly drawl statement Consolidated Treasury Receipt (CTR), Income Tax Calculation of Employees etc. from the portal.
- A pensioner (1,20,000) can get his annual verification online from any treasury office in the state.
- SMS alerts for Monthly Salary payment , Arrears payment ,Advances payment, Pension payment is sent to employees/pensioners
- Treasury services are not location specific. Government grants and funds can be transferred to all locations from single point in the line of CBS.
- It has triggered a cascading reaction for inducting governance in planning, registration, budget and other related departments.
- It enables a better HR management scenario for maintain transfer and postings across the state in hassle free environment.
- State Government could easily discover and compute the financial stakes with other state and central governments.
- Cyber-highways help in bridging the geographical divide and reaching to unreached.

Implementation coverage

The existing project provides the following services:

- Online Bills Module
- Online CCL/DCL/PLA E-Cheque Generation
- Online Pension Paper Generation along with Capturing of Photo, Thumb and Signature
- Online Integrated Child & Social Development (ICDS) Department Payments direct to beneficiary accounts.
- Online Social Welfare Department Payments direct to beneficiary accounts.
- E-challan for any kind of Government Receipts
- Double & Single Lock
- Biometric (Aadhaar Based) Digital Life Certificate
- Integration with SBI Corporate Banking (Using SFT) for Treasuries E-Payment
- Integration with RBI for Government E-Receipts
- Automated Income Tax Calculation forms like – 16, 16A, 24Q, 24G
- E-Stamping integrated with Stock Holding Corporation Ltd (SHCL)
- Integration with Various Departments like Excise, Commercial Tax etc for generation of E-Receipts
- Online Communication, Release, Allocation and Revision of Main & Supplementary Budget
- Re-Appropriation of Budget at the Finance Department
- Pay & Pension Generation Module of Autonomous Bodies at DDO Level
- SMS & E-Mail Service for all stake holders
- Online availability of Transaction Data for NSDL for New Pension Scheme
- On Line LPC for Employees/Pensioners

Number of Internal users of the system

- 1-Chief Secretary
- 1-Additional Chief Secretary
- 1-Principal Finance Secretary
- 1-Finance Secretary
- 1-Director Treasuries, Pension & Entitlements
- Approx 450 Treasury User
- 4200 DDOs
- 250000 Employees
- 120000 Pensioners
- 450000 (approx.) number of external users

Outcomes in terms of Efficiency, Improvements and integration

- Project has clearly demonstrated potential of e-governance in laying foundation for good governance. It has enhanced people's trust in financial management, Govt. computerization and better resource planning.

- All 86 Treasury Offices are making E-payments using SBI Corporate Banking (Using SFT) directly to beneficiary account and RBI for Government E-Receipts
- Secretaries, Head of the Department (HOD's), DDO's gets consolidate reports from the Dashboard for Budget Allocation and Expenditure.
- Public Works (CCL/DCL/PLA) Online Payments using E-Cheque Generation
- Autonomous Bodies Salary and Pension Generation Module
- Online Pension Paper Generation and Pension Payment Order (PPO) Module
- Besides delivering E-governance to state, project has given a knowledge base for wide spectrum of decision making of immense value.

ENABLER INDICATORS

The concept of Core Treasury System is unique because it is only use ICT but reengineering the business process of the treasury functioning to provide transparent, prompt, objective and hassle free services.Core Treasury System is designed and developed to provide user interface to various users of treasury department and others in the state. CTS provides real time data of treasury transactions from central data server

Network: SWAN
Treasuries: 86 connected thorough SWAN
Main Users: Department of Finance, Treasuries, Head of Departments, Finance Controllers, Bankers, Employees and Pensioners etc
Alternative connectivity through VSAT
Grant/Scheme Wise Progressive Expenditure/ Receipts / Budget Details

Process reengineering
- Budget Allocation / Revision by Head of Departments to its DDOs not linked to budget provisions
- Late availability of budget /LOC allocated to DDOs in Treasury Office
- Passing of bill in the treasury based on paper form budget
- Monitoring Ways & Means clearance of large amount Bills
- No process for Online tax deposit interface for Commercial Tax
- Frequent visit of DDO's to enquire about the status of bill
- Non availability of timely Expenditure and Receipt details
- Salary and Pension are not getting in time

Leadership, Change Management,Capacity Building during transition
- NIC has deputed a team of ICT professionals to coordinate the software design, development, implementation, training & day-to-day technical coordination.
- Computer basics training was provided to the F.D. Officials.
- To kick start the project, state level workshop for DDOs was conducted at Dehradun.
- Regular Trainer's Trainings are conducted for TO/ATOs at the state level.

- Regular exclusive workshops were organized for Finance Department.
- Trainings are being regularly conducted for DDOs, Treasury Officers Accountants and Bank Officials at Accounts Training Institute Dehradun.
- Special sessions for DDO's were organized by Finance Data Centre
- Treasury Officers feedback meetings were conducted to improve the functionality in the system
- Comprehensive FAQ's were designed to answers the most common queries.
- A toll free helpline is available to provide support to the officials

Technology
- Web based system with 3-tier architecture.
- Developed in ASP.NET with Oracle 11 g as database server for Internet users.
- Developed in Oracle Forms & Reports with Oracle 11 g as database server for Intranet users.
- Integrated with Electronic Payment System for all treasury transactions and having bank interface for updating digital data.
- Secured Role based access
- Comprehensive audit trail of every transaction.
- Maker & Checker Concept
- The application is housed in-house and no third party Data center is in use currently
- The Project is under our own maintenance

VALUE INDICATORS
- Without creating any significant burden on state exchequer, a hybrid solution has been developed for the existing system of Budget and Treasury operations. It is very cost effective, user friendly and less time consuming in its implementation and gives results as effective as a web based solution.
- It is the only system in India providing direct linkage of the budget provisions up to the DDO level allocation
- Every budget allocation, revision, re-appropriation and releases up to DDOs level are done online.
- The entire state finances have been brought under the ambit of e-Governance. Every accounts official has to adopt the IT environment. It is a major achievement of these reengineered processes.
- The system has more than 280000 role based users.
- It has brought transparency in the working at different levels and avoided any duplication of data & efforts, thus saving a lot of time.
- It has restricted the departments to incur expenditure within the budget and has a check on day-to-day expenditure to keep its ways & means position in control.
- The project is futuristic in nature and new systems like e-Billing, e-Pension and e-Receipt have developed by using this Budget as base. User ids

allotted to about 280000 users are being kept same for providing such more facilities to these users.

Digital Inclusion

A vast population, majority in rural areas, remains excluded from digital opportunities. More than 15826 villages, 6982 panchayats, 5,000 blocks and 10 districts still require digital intervention to serve communities till the last mile. Most of the schools are in interior. So they were not getting the eServices being provided by State Govt. In Uttarakhand for eServices 3381 CSC centers and more than 100 eDistrict centers are opened. These centers are providing many eServices viz. Employee Pay slip, Pensioner Pension Slip, Annual Statement, Life Certificate submission, e-Payment, Copy of Registered Document, Govt. certificates issued by District Administration, On Line Bill Submission by DDOs etc.SMS services are also provided to employees/pensioners/citizen so that messages reached up to the last interior beneficiary.

Green e-Governance

- Reducing the size of Documents
- Printing less number of Budget Documents
- Reducing the paper usage
- Making information digitally available

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Computerisation of Land Records (Dharitree)
Revenue and Disaster Management Department, Government of Assam

T. Y. Das and Hemanta Kumar Saikia

PROJECT OVERVIEW

The Computerisation of Land Records Project (Dharitree) was initiated by the Revenue and Disaster Management Department of the Govt. of Assam during 2010-11 with the technical support of the National Informatics Centre, Assam State Centre with an objective to achieve improvement in terms of up-to-date maintenance of land records, quality of data, practice of using a uniform standardsystem throughout the state, timely completion of the land records' updation processes and hassle free delivery of citizen-services in time, by eliminating the drawbacks of the existing manual system mentioned below, through the use of Information and Communication Technology (ICT) tools, Business Process Reengineering (BPR) and an web-enabled application :

- Inordinate delay in land records correction/updation and huge backlog of records correction in two different geographically distant and segregated offices of the department, viz. Revenue Circle Offices and District HQs.
- Delay in timely completion of Mutation (transfer of ownership), Partition (of land parcel), Conversion (change of lease period) etc. processes and associated record correction and thereby causing harassment to the citizens.
- Delay and harassment to the citizens (land owners) in providing their legitimate land documents/certificates (viz. Copy of RoR, Land Holding Certificate, Land Valuation Certificate, Income Certificate etc.).

Expected Benefitsto the Stakeholders:

The benefits which were expected from the process re-engineered CLR (Dharitree) system to be extended to different stakeholdersare –

- Immediate correction and up-to-date maintenance of records by the Circle Officer (Tehsildar) himself/herself after order is passed by him/her instead of Lot Mandal (Patowary) as in the earlier manual system and thereby eliminating the drawback of backlog of record correction.
- Timely completion of Mutation, Partition, and Conversion etc. processes through minimum data feeding and automatic generation of Notices, Orders, and Certificates etc.
- Timely and hassle free delivery of citizen-service documents, say, Record-of-Right (Jamabandi) copy, Land Valuation Certificate etc. with payment of exactly the minimum service charge only, from the Revenue Circle Offices instead of the district HQ as was the practice earlier so as to save their valuable time and money.
- Instant generation of Case proceedings and providing to the Judiciary without delay for early disposal of land dispute cases at the Court of Law.
- Providing a set of very useful MIS reports to the higher authority of land records administration for easy monitoring of various cases status and for quick decision making.

Approach Taken

A completely holistic action plan for achieving the planned objective and coverage, consisting of time schedule of project life cycle, guideline documents for legacy data entry, tender paper, H/W and S/W purchase, their deployment in all the locations, capacity building training programme for ADC (Revenue), Revenue Circle Officers, Lot Mandals (3000 numbers), deployment of resources and operationalisation of the system by regular review of planned activities by the project leaders by holding regular personal presence meetings, VC (Video Conference) meetings etc. and field visit by project team members for monitoring the progress were the keys factors helping in achieving the smooth transition and realising the project objectives.

ICT Initiative during the last two years

During the last two years a new thrust with a number new ICT initiatives for digital inclusion in all the Revenue Circle Offices with the participation of all the users of the department to further improve the efficiency and scope of the project was given so that transaction processing processes like Mutation, Partition, Conversion, A.P. (Annual Patta/Lease) Cancellation (cancellation of Annual Lease of defaulters) etc. get completed in time and citizens are delivered their legitimate documents like-RoR copy (Jamabandi copy), Land Holding Certificate, Land Valuation Certificate, Income Certificate etc. are delivered in time withoutany harassment and waste of time and money. To mention a few, the following are the some of the new initiatives taken during the period:

- A completely new CLR (Dharitree) application integrated with property registration (e-Panjeeyan) system, have been developed in open source platform i.e. PHP (development language), and Postge SQL (database platform) with advance features like SMS gateway, Aadhar integration for e-KYC, Unicode , browser independence , Digital Signature Certificate (DSC) etc. for implementation as a centralised online system within very soon.
- Digitized Cadastral Maps have been integrated with the existing Dharitree system for regular updation of maps and issue of maps with RoR copy to the citizens.
- A mobile app has been developed to be used by the Lot Mandals for updation of data and report from the field itself.
- A few important augmentations, such as Conversion Process, Annual Patta (Annual Lease) Cancellation Process, Land Valuation Certificate, and Income Certificate have been added to the system to make the system more reliable.
- A set of very useful MIS reports have been augmented in the system so that status of every land records updation can be monitored by higher authority of land records administration.
- To leverage the old ICT infrastructure of Revenue Circle Offices initiatives have been taken to integrate the infrastructure provided for e-District project at the same location which were under the LINUX platform. Necessary efforts have been given by NIC to overcome the challenge of integration of infrastructure in proprietary platform (CLR project) and open source platform (e-District project) so that every land records activity can be done comfortably in time.

Present Status

The project was planned to be implemented in erstwhile 121 (presently 123) Revenue Circle Offices and erstwhile 21 districts (presently 28 districts) of Assam with all the functions and features mentioned above. Presently it is operational in all the 123 Revenue Circle Offices of 28 districts providing all the services planned. Also the integrating CLR (Dharitree) and the digitized cadastral maps application (Bhunaksha) system have been operational in all the above locations for up-to-date maintenance cadastral maps and delivery of maps to citizens along with copy of RoR.

RESULT INDICATORS

Key Performance

The various workflow-based transaction processing as well as document service delivery processes operationalised during the period 2014-15 and 2015-15, their volume and associated befits realized by stakeholders have been laid down below:

Table: Benefits Realised

Service Name	Year-wise Volume	Benefits Realised
Mutation (Transfer of ownership)	2,07,013(2014-15) 2,15,000(2015-16)	As against the earlier system where the citizen had to pursue their matter/case several times by visiting the District collector's office/Circle Office and chasing after the Lot Mandal (Patwary) or Lawyer for getting the service, now they are getting their Mutation Order being passed and records corrected within stipulated time, by simply registering a petition in the computerized system at the Revenue Circle Office only.
Partition(of)	3630(2014-15) 15,000(2015-16)	This has enabled them in getting their legitimate copy of RoR(Jamabandi) in time and thereby enabling them to avail all the benefits out of possession of this documents, e.g.- permanent residency proof, loans, and further land transfer right, etc.
Conversion (A.P. to P.P.)	87,000(2014-15) 11,035(2-15-16)	The timely completion of Conversion (Annual Lease Patta to Periodic Lease Patta) cases has helped citizens in getting the Periodic Lease Certificate (Periodic Patta) in time and thereby becoming permanent owner of the land and getting all the benefits out of it.

Service Name	Year-wise Volume	Benefits Realised
A.P. (Annual Lease) Cancellation	4235(2014-15) 726(2015-16)	• Getting the benefit of easy monitoring of the disposal/pendency status of every mutation, partition, conversion etc. cases. • Up-to-date maintenance of Land Records has helped government in reducing unwanted land disputes and improving planning, decision making and revenue collection. • From conversion of Annual Lease to Periodic Lease government is benefitted by earning more revenue in terms of conversion fee(premium) and annual land revenue.
RoR (Jamabandi) copy	2,72,146(2014-15) 2,40,000(2015-16)	• Citizens(land owners) are now extremely benefitted by getting RoR(Jamabandi) copy in time with the payment of only the service charge(fee) and by making a single visit to the Revenue Circle Offices which is much nearer to their home. • Generating additional revenue from citizen-centric services has enabled the government in meeting the consumable cost of the project and thereby making it sustainable.
Land Holding Certificate	60,554(2014-15) 2,00,234(2015-16)	
Land Valuation Certificate	3394(2015-16)	
Income Certificate	2,000(2014-15) 5,000(2015-16)	

Implementation coverage

Functionality – The new system was planned to cover all the necessary transaction processing functions as mentioned above as well as citizen-services functions so as to maintain land records up-to-date at all the time and provide citizen all the necessary services without delay.

The computerized land records project (Dharitree) was planned to be implemented in all the 121 Revenue Circle Offices of non-Sixth-Scheduled 21 districts of Assam which are under the direct administration of the state government for the benefit of up-to-date and timely maintenance of records and delivery of both transactional as well as informational (documents) service to the land-holding citizens from these government offices which are nearest to their home. As on today, the project is operational successfully in all these planned locations of the state fulfilling the objectives planned. In terms of land area the geographically coverage of the project isin around 9,92,200 hectares (72,70,043Bighas) of land. And the number of plots (parcels) for this geographical area is 58,15,381numbers. Along with all the existing planned land records updation transactional processes, viz. Mutation, Partition (of a plot/dag) all the new transaction processing processes, viz. Conversion (change of lease period), Cancellation of Lease (Patta) holding etc. and new citizen document services viz.(i) Land Valuation Certificate, and (ii) Income Certificate have been

extended to all these 121 locations and have been delivering successful service. Also in the current year, 2016 the scope of CLR(Dharitree) system has been enhanced by integrating Digitised Cadastral Maps system (Bhunaksha) in 121 Revenue Circle Offices for regular up-dation of maps along with Chitha, Jamabandi (RoR).

Also the land records system Dharitree have been integration with Property Registration System (e-Panjeeyan) so that cross verification of deeds as well as land holders, and land property size etc can be done from both offices, so that the project can ensure title guaranty.

Outcomes in terms of Efficiency, Improvements and integration
Many significant outcome have resulted, especiallyduring the last two years, out of implementation of the project in terms of efficiency, improvement in updation, maintenance of records and service delivery to the citizen as well as to the government.For the delivery of various government services in stipulated time period an act called Assam Right to Public Service (ARTPS) Delivery Act has been enacted since 2012. After implementation of this project many services of land records has been delivered within or much before the stipulated time. Citizen has been greatly relieved by the payment of only the service delivery charge which is being acknowledged at the time of registration of the service request.

- Set of MIS report has helped the higher level authorities to monitor the status of every case of record updation and service delivery and thereby pushing forward the objective of providing an efficient system of land records administration.
- Before implementation of this project there was a racket for delivery of forged RoR which has emboldened land disputes and loss of income of the government out of delivery of RoR (Jamabandi) copy. But, after the implementation of the Bar-coded RoR delivery service from the Dharitree system this racket system has been completed averted.
- Change of Actor for record correction to eliminate delay in records correction: Now Revenue Circle Officer himself/herself presses a button in the system to correct records after passing order by him/her self. This has totally eliminated the delay in records correction and made land records up-to-date. This has also helped in timely delivery of land records documents/certificates to the citizens.
- Cadastral Maps are very important records of land displaying every plot (dag) polygon in a village map. Before computerization till last year (2015) there have been huge gaps in map updation resulting in inaccurate picture of cadastreand issue of plot map to the land owners. From the beginning of current year (2016) digitized cadastral map system (Bhunaksha) has been integrated with the land records attribute data maintenance system (Dharitree) and thereby enabling the regular updation of cadastral maps along with RoR (attribute data).
- Also the new open source-based platform-independent CLR (Dharitree) system has been integrated with the property registration system (e-panjeeyan) very recently which is planned to implemented within very short time as an online system with the building the network connectivity

to each of the Revenue Circle Offices and Sub-register Offices within a span of two months from now.

ENABLER INDICATORS

Many enablers have played important roles during the life time of this project without which achieving the planned objectives would not have been possible. It goes without saying that without deployment of ICT infrastructure and proper disaster recovery plan, expecting the success of an e-governance project like CLR (Dharitree) would be like trying to find "turtles eggs at hill-top". Accordingly a right set of state-of-the-art ICT infrastructure was deployed in all the 123 locations with disaster recovery plan. Along with a set of very sincere and dedicated leaders pushing forward important activities like process re-engineering, continuous capacity building, and change management strategies, it has made possible the achieving the desired goals of the project.

Process reengineering

Experiences gained by experts from the implementation of e-Governance projects suggest that the contribution of Government Process Re-engineering (GPR) is around 35-to-40% in the success of a project. Accordingly, process reengineering was done wherever it was appropriate and feasible. The following changes were done through re-engineering of the existing system to achieve efficiency, economy, and quality of data:

- The Report format of the main register CHITHA has been redesigned and re-organised by adding additional columns to make it more informative and accommodate in A4 size paper for printing. One important addition in this format has been made to record ecological and historical information.
- The other very important Record-of-Right register (Jamabandi) is now prepared automatically by deriving data from the CHITHA register.
- Change of location and actor most of the services– earlier most of the record correction related transaction processing processes like Office Mutation, Office Partition, Conversion, A.P. (Annual Patta) cancellation etc. and citizen-services like RoR (Jamabandi) copy, Land Holding Certificate, Income Certificate etc. used to be delivered from the District Collectors offices only. Now, all these processes and services have been shifted to the grass-root level Revenue Circle Offices. This has greatly improved (99%) the efficiency of transaction processing, records correction and service delivery to the citizens.
- To eliminate the earlier system's drawback of up-to-date record correction the actor has been changed. Now, the Circle Officer, who passes order, himself corrects records by pressing a single button in the system instead of the Lot Mandal (Patwary-head of cluster of villages) as in the earlier system (who was a bottleneck in the system).

It was learnt from the above process re-engineering that these have improved the quality of data, made land records data up-to-date, services get delivered in time, and brought satisfaction to the citizens in terms of efforts, cost and time. The land records authority also now can monitor the status of land records very easily and can take correct decision in time. The shifting of the majority of the transaction

processing and service delivery processes from the District Collector's Office to the Revenue Circle Offices was resisted by the land records administration there. But, by the proper change management strategy of the leaders of the Revenue Department, Govt. of Assam has made the changes happen.

Leadership, Change Management, Capacity Building during transition
Role of Leadership:
Without the constant support, guidance and active monitoring of the visionary leaders like Shri V. K. Pipersenia, IAS, present Chief Secretary and erstwhile Principal Secretary of the Revenue & Disaster Management Department, Govt. Of Assam during 2009-12, and Shri P. K. Tiwari, IAS, Principal Secretary during 2014-15 and presently from September, 2016, and Mrs. T.Y. Das, IAS, Addl. Chief Secretary of the Revenue & DM Department achieving the desired goals would not have been possible. All these leaders have been taking the project in a mission mode spirit by constantly guiding the project team in many matters, preparing necessary policy for survivability and sustainability of the project, amending existing Land Act (Assam Land and Revenue Regulation Act), pushing forward continuous capacity building trainings, workshops etc. and constantly monitoring the project by holding face-to-face and Video conference (VC) meetings with all the users of the project

To properly utilise the fund generated through citizen-centric services for the maintenance of the project, a society, called Assam Land Revenue Management Society has been formed recently, in which service charge will be deposited directly and will be distributed to different Revenue Circle Offices (Tehsil Offices) according to their maintenance need. During 2011-12 the projected was audited by the IT audit team of the Office of the Accountant General, Assam and according to their suggestion only, a service charge management society, as mentioned above was formed for the sustainability of the project.

Although building the capacity of the non-ICT savvy person to ICT-savvy person (users of the project) was a big challenge for the state NIC project team of three persons and one/two persons at District NIC Office, but this was achieved by conducting several rounds of capacity building training programme on web-enabled Dharitree during the transition year 2010-11 for ADC(Rev)s(27), Circle Officers(150) Lot Mandals(3000 nos.) and Supervisor Kanango(SK)s(50) at State HQ and District NIC Offices. After that till today capacity building has been made a continuous process. During the month of September, 2016 two capacity building training programmes have been conducted on the new integrated open source-based Dharitree- one for Additional Dy. Commissioner (Revenue) and other for the District Informatics Officers of NIC, at DILRMP (Digital India Land Records Modernization Programme) model training centre at Guwahati. Also regular review meetings were held with all key stake-holders whereby it was possible to manage necessary changes.

Many lessonswere learnt out of managing the new changed environment. The most importantare– (i) building up of a dedicated in-house team for taking care of many issues relating to the project, such as ICT-infrastructure maintenance monitoring,

capacity building, field visit for monitoring the field activities, issues, and progress is very important.(ii) A set of auto-generated online MIS reporting system is very important to monitor the implementation progress of transaction and service delivery cases.(iii) A bold leadership to care of challenges of procedural change, financial management, capacity building and other change management activities.

Technology
Looking forward with the objective of putting Land Records data on the web for all the time access by all categories of stake-holders, the computerised land records system(Dharitree) was developed as an web-enabled application using ASP as the front-end development tool and SQL Server as the backend database platform, initially, during 2005-06 when those were the prevailing state-of-the-art technologies for web-based application. Also, C-DAC India's product I-plugin was used for the support of local language data in Assamese as well as Bengali. But, following the Govt. of India's recommendation for adopting standards for e-Governance applications the same CLR (Dharitree) application have been recently developed again adopting many standards like- using of open source and open standard technologies, e.g. PHP, PostgreSQL, Bootstrap etc. , metadata standards, Unicode compliance , integration with property registration and digitized cadastral maps for reducing cost, interoperability, platform independence and sharing data among different related stakeholders of the application.

Developing software is easy but its maintenance is not so. But, since NIC has been involved in the project (which is a completely government organization) as the complete technology solution provider, NIC has been taking care of regular upgradation and maintenance of the application without any extra cost. Also, forthe security and safety of data which are generated at the Revenue Circle Offices, a daily, weekly and monthly data backup are taken by the Circle Officer on CD media and sent to the District HQ for maintaining a backup copy there. In addition to that the same backup copy of data is uploaded on a ftp portal maintained by NIC for added disaster recovery and service continuity plan.Also, SMS gateway is being implemented in the recent open source based application for intimating the land-holder about the status of progress of their cases.

The following technology related problems faced
- The existing Microsoft proprietary platforms Windows, ASP, SQL Server and C-DAC's I-plugin based application challenges making local language data (Assamese and Bengali) in web-browser. The application was accessible only through IE (Internet Explorer) browser and that to upto IE version 8.0. Beyond this version IE was giving problem in accessing the application.
- Again porting local language data (ISCII-Indian Standard Code for Information Interchange) to open source based PostgreSQL database platform in Unicode open standard was a big challenge initially because of new technology and volume of data. But that was overcome with a dedicative R&D effort.

VALUE INDICATORS
Digital Inclusion
The main vision of the project was to provide efficient land records services in the local languages (Assamese and Bengali) to the citizen (main stakeholder) with minimum effort,cost and time, irrespective of demographic (male, female, or transgender) and cultural differences (Assam being a cultural barrier free state).

Green e-Governance
The computerized land records system being a completely workflow-based ICT system, the entire RoR (Record-of-Right) as well as CHITHA (Field Index Register) data are maintained in database format and also all the field reports required to be submitted by the LM (Lot Mandal) and Supervisor Kanango (SK) and notices required to be served are in electronic format and thereby greatly saves manual paper works and contributes to green e-Governance. Also, in the recent endeavour, the distributed Dharitree implementation will be replaced by the data centre based online Dharitree (planned from 1st January, 2017) which will eliminate the use of high-end server machine in each of Revenue Circle Offices (121 nos. as on today) and greatly save power consumption by ICT infrastructure of the project and will hugely contribute towards green e-Governance goal.

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FIPB: Proposal Management System
Department of Economic Affairs, Ministry of Finance, Government of India

Saurabh Garg, P. K. Garg and Gaurav Masaldan

PROJECT OVERVIEW

The Foreign Investment Promotion Board (FIPB), Ministry of Finance, Government of India (GoI) considers and recommends Foreign Direct Investment (FDI) proposals not covered under the automatic route. The system, deployed provides an online application to facilitate single window clearance for proposals of overseas entities.

The objectives of the project are

To facilitate prospective investors with the flexibility of anytime, anywhere by

- Online submission of proposals for FDI investment/downstream intimation.
- Tracking their status as well as get updates.
- Raising and responding to queries of FIPB and administrative ministries/departments in timely manner.
- Reducing the paper work and no. of physical sets of documents to be submitted.

To facilitate FIPB by

- Online forwarding of proposals to the concerned administrative Ministries/Departments.
- Seeking clarifications by raising queries in respect of proposals.
- Preparing agenda for forthcoming meetings.
- Publishing the meeting notice, agenda, and press release for their quicker dissemination.
- Using SMS/Email for alerts to applicants/administrative ministries/ departments.
- Searching status as well as history of proposals based on various attributes such as name of the investor/investee/downstream company/proposal no/meeting no. etc.

To facilitate Administrative Ministries/Departments by

- Furnishing comments on proposals forwarded by FIPB.
- Seeking clarifications by raising queries in respect of proposals.
- Responding to the queries of applicants.

The above objectives were achieved soon after its launch in February, 2015 with 100% of the proposals being submitted online through the system. In fact, today nobody visits North Block for FIPB clearance because everything is online. The application is online, the clarifications if any are online, and the consultations with ministries are also done online. Major enhancements carried out since the launch of the application include the following:

- Capturing shareholder details in the proposal form.
- Incorporation of the facility to upload additional forms.
  - MHA Forms required for security clearance for specified sectors or the investor/director from specified countries.
  - M/o Health forms required for essential clearance for health sector.
  - Pharmaceutical sector specific form.

- - Self-certification /affidavit.
  - Certificate for LLP compliance for LLP cases.
- Incorporation of the module for downstream company information submission by the applicant after sanctioning of the project.
- Incorporation of sector and sub sector in the proposal apart from the NIC code.

Key learning from the project includes:

- To consult various stakeholders during the design phase
- To pay adequate attention to database design before commencing the coding
- To prepare good user documentation

RESULT INDICATORS

Digitization of FIPB's system has brought transparency, real time updates, made the processing faster, elimination of repeated entries/records, enhanced resource management and better coordination among administrative ministries. This system achieves the objective of improving the overall effectiveness and efficiency of the FIPB by providing secure, reliable, and efficient system and cutting down the time and cost of delivery of service.

The digitization helps in "Minimum Government Maximum Governance" and "Ease of Doing Business" by providing high level of transparency as well as brings following facilities to the investors:

- *Global reach* – Apply from anywhere in the world! Access status from anywhere in the world! Transact while on a move.!
- *Quick Communication* – All correspondence including updates/decisions through SMS/email to avoid the delays adding to speed and efficiency.
- *Quicker Processing* – FIPB forwards all the proposals on line to the concerned Ministry/Department for processing, queries are raised on-line eliminating the physical delivery and loss of time due to the postal delay.
- *Less Paper Work* – Single signed copy needed (for record) instead of multiple sets of applications.
- *SMS/email alert* – Regular alerts are sent to the applicant related to the queries raised by administrative ministry, inclusion of the proposal in the scheduled FIPB meeting and decision.
- *Transparency* – All the transactions and correspondences are recorded online.

Key Performance
Benefits obtained from these services

- FIPB Proposals are complex in nature and require consultation with various administrative ministries. However, the entire process is carried online and users are not required to visit the Department.
- No. of paper sets to be submitted by the Applicants has been brought down to 1 from 18

- Processing time of the proposals has been reduced.
- FIPB forwards all the proposals on line to the concerned ministry/ Department for processing, queries are raised on-line eliminating the physical delivery and loss of time due to the postal delay.

Table: Year-wise transaction volumes

Name of Service	Volume of Transactions (Nos.) from March 2015 till the submission date	Breakup of volume (Nos.) in terms of mode of delivery	
		Through Online direct	Others
Proposals	840	440	400(legacy data)
Raising the Query	1434	1434	
Agenda	176	18	158(legacy data)
Press Release	138	18	120(legacy data)

Implementation coverage

The coverage includes all stakeholders involved in the process viz. the investors, FIPB and administrative ministries/departments. The new services added include the following to facilitate online:

- Submission of proposals/queries/clarifications/downstream intimations by the applicants.
- Tracking the status of the proposals including SMS/Email alerts of the progress of the proposal.
- Consultation by FIPB with various administrative Ministries/Departments by forwarding applicant proposals/queries and receiving responses.
- Preparation of agenda, recording of decisions and dissemination of meeting notice, press releases by FIPB.

Outcomes in terms of Efficiency, Improvements and integration

- As the applicants are now required to submit physically only one set of documents along with proposal in place of the 18 required earlier, it has resulted in considerable savings for them.
- The average processing time of the proposals by FIPB now stands at xxx days

Specific innovative ideas implemented in e-Gov area and their impact on services.

- Online consultation amongst various stakeholders thus enabling quicker decision and reducing the pendency on the proposals
- Incorporation of SMS/Email alerts about status of the proposals thus reducing the personal/telephonic enquiries at FIPB
- Analysis of proposals by sector to facilitate formulation of policies

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems
- Integration of the application with eBiz portal of DIPP is in progress to facilitate single window clearance of various services for setting up business in the country and facilitate Ease of Doing Business.

ENABLER INDICATORS
Process Reengineering
- Standardisation of the proposal format to facilitate various kinds of analysis to guide in framing policies
- Reducing the paperwork was achieved successfully by cutting down on the no. of physical copies of the proposal submitted to 1 from the earlier 18.
- Forwarding physical proposals to the administrative ministries/departments which was a time consuming process, eliminated in the new system with electronic forwarding by FIPB thus enabling ministries/departments to respond quickly.
- Raising queries to applicants by administrative ministries/departments and FIPB and receiving responses by the applicants has been made completely online
- Circulation of meeting notice, agenda, press releases for FIPB decisions are carried out electronically to facilitate quicker dissemination

Challenges faced in implementing Process changes
- Capacity building
- On-boarding of administrative ministries/departments
- Gradual changes in FDI Policies

The Lessons learnt from the Process re-engineering exercise
- Standardisation of proposal format is the key to enable successful implementation
- Requirements of the other stakeholders need to be incorporated to facilitate quicker adaption of the system
- System should be able to adapt to on-going policy changes in timely manner

Best practices adopted from the industry/ other State implementations
- Prior registration of the applicant incorporating mobile and email validation to reduce bogus applications
- Multi part proposal entry form with facility to save the same as draft at intermediate stages
- Highlight pending proposals at various stages of workflow to focus attention of users
- Provision of multiple filters and export options for MIS reports
- Template based and customisable SMS/Email alerts to all stakeholders in English as well as Hindi at important stages of the life cycle of the proposal

- Preparation of an adequate set of FAQs to aid the users and reduce telephonic queries
- Provision of context sensitive help to users

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
- The top leadership in the Department was dynamic and extremely supportive of the initiative. It provided a clear direction to the project in terms of the objectives and actively pursued various stakeholders including applicants and administrative ministries/departments to bring them on-board which enabled the implementation to progress on expected lines.

Change management and Capacity building strategy
- Involving a group of users to test the critical modules and provide feedback for improvement
- Conducting multiple training sessions/workshop for administrative ministries/departments and FIPB officers
- Outreaching to the administrative ministries/departments to bring them on-board
- Preparing user documentation

Project management & Monitoring
- Regular meetings were held during application development phase to review the progress.
- Impact assessment on various system modules was carried out and documented before incorporating changes due to the policies and enhanced requirements.
- Presentations were made to various stakeholders to ascertain and incorporate their views

Financial model adopted
- Resource augmentation for the software development and maintenance team, where necessary, was carried out with funds provided by the Department.

Special efforts to ensure sustainability of the e-Governance initiative[s]
- Though the system has not undergone any third party functional assessment, it has self-sustained due to involvement of various stakeholders. Security audit was carried out before launch of the application through CERT-IN empanelled vendors to remove vulnerabilities by incorporating their recommendations. Periodic security audits are also planned.

Challenges faced in transition
- To sensitise the officials to handle the electronic flow of the proposals.
- Incorporation of enhanced requirements due to changes in policies etc.
- Capturing the legacy data of past two years

The Lessons learnt from Change Management and Capacity building
- Engagement of users at various levels of Governance hierarchy during development lifecycle facilitates quick adaption of the new system.
- Commitment of the top management is necessary.
- Providing context sensitive help and user manuals go a long way in acceptance of the new system.

Technology
Technological solution adopted
- Application uses a three tiered architecture under Microsoft .Net/SQL Server 2012 platform. It is hosted in NIC data centre at Shastri Park.

Compliance of the Technology adopted with e-Government standards
- It complies to e-Government standards for location codes for interoperability with other systems. For security, the audit was carried out through CERT-IN empanelled auditors.

Strategy for Disaster Recovery and service continuity
- Backup of the application and database are maintained at Disaster Recovery Centre. Though the system does not provide any fall back option at present in the event of the failure of the primary data centre, it is proposed to be brought on cloud platform to incorporate service continuity requirements.

Impact and value-addition thru adaption of Social media
- The application does not warrant usage of social media as the nature of application is confidential, flow of information is peer to per basis and there is no information flow outside the closed group.

Technology related challenges
- Integration with SMS Gateway
- Using latest version of the database
- Proposed migration of the system to cloud platform

VALUE INDICATORS
Digital Inclusion
- Users of the system are prospective investors well versed with English language. Therefore, the UI incorporates only single language. However, the SMS/Email uses Unicode to generate bilingual alerts.

Green e-Governance
- Application helps in reducing the paper consumption as the number of paper sets to be submitted by the Applicants has been brought down to 1 from 18.All queries raised and their responses are in the electronic form.

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e-GRAS Integrated with e-Stamping
Treasuries and Accounts Department, Government of Haryana

C. G. Rajnikaanthan and Deepak Bansal

PROJECT OVERVIEW

e-GRAS (Government Receipt Accounting System) is one of the initiatives taken by the state Government to receive all sorts of Government receipts online through this system only and measures to improve the delivery of services to the citizens. It has been implemented all over the State w.e.f. December, 2013 and it is running successfully. e-Stamping, one of revolution in era of Citizen centric services, has been integrated with e-GRAS to generate stamp paper online of any denomination, while sitting at your home. This facility was launched by Hon'ble Chief Minister on 2nd May 2015. This is the only system in India in which state receipts system has been integrated with Common Service Centers (CSC) established by State I.T department. From 1st May 2016, e-stamping has been made compulsory in four districts namely Panchkula, Sonipat, Gurgaon and Faridabad**.** The goal of this project is to provide both tangible and intangible benefits that will not only improve the efficiency and effectiveness of the services being delivered to citizens and bring transparency in chain. The goals of the Project are as follows:

- Deposit tax any time any where basis.
- Achieve 100% generation of hassle free online challans.
- Single challan format for all sorts of state receipts.
- Paradigm to cashless transactions.
- Real time, transparent and actionable financial information and analytics.
- Well defined information channels with greater control and accountability.
- Consolidation of otherwise fragmented information environment into an integrated system.
- Provide facility to pay various taxes/payments to state Government, while sitting at your home/workplace without any convenience fee (if paid through internet banking).
- Eliminate fraudulent refunds by online verification of receipts and defacing of challans after refund takes place.
- Minimize citizen interaction with Government Department and present him a bouquet of services online.
- Automate refund process, with provision to apply online.
- Prevent misuse of stamp papers by integrating with Property Registration System.

RESULT INDICATORS
Key Performance
Government to Citizen/Business

- Deposit tax all type of government tax, fee etc. any time any where basis,
- Integrated with portals of major receipt transacting departments such as Revenue, Excise and Taxation, Transport, SSC, Public Health Engineering, Industry and CSC-SPV for online generation of Challan, payment and verification
- Achieve 100% generation of hassle free online challans.

- Single challan format for all sorts of state receipts.
- Facilitate to pay online by Debit/Credit card and internet banking (without any extra charges) from 50+ nationalized banks.
- Online stamp paper generation for everyone.
- Provisioning of stamp paper generation by stamp vendors by giving them discount as per existing rules.
- Integrated with CSC (Common Service Centre) wallet to avail stamp papers from nearest CSC.
- First system in India to link e-stamping with property registration system to avoid any fraudulent activities.
- Facility to apply online Refund for stamp papers.

Government to Employees
- Employees who are on deputation can deposit their GPF contribution at this portal.
- Employees can pay arrear of their NPS contribution.
- Employees can pay interest of various loans (Marriage, Festival Advance etc.) at this portal.

Government to Students
- Students can deposit their fine or any other dues to be paid to State Government at this portal.

Benefits obtained from these services by each category of stakeholders:
- Better management of state funds due to instant availability of online receipt details
- Eliminated fraudulent refunds without receipts
- Interface with AG office to reduce their manual efforts by about 40%
- Interface with Banks helped in making prompt payments and reducing reconciliation issues.
- Eliminated the problem of parking of funds by DDO.
- Reduced number of Audit Paras.
- Curtailed raising public debt to the minimum and well below the norms prescribed by the Planning Commission and Finance Commissions
- SMS alerts to the payees.
- Online verification and conformation of receipts to all

Table: Year-wise wise transaction volumes for various services

Activity	2013-14	2014-15	2015-16
Total Amount of Receipt Transaction in Treasuries (in crores Rs.)	31,979	7,638	61
Total Amount of Challans thru e-GRAS (in crores Rs.)	4,249	34,815	39,008
Total No of Challans generated	59,67,845	28,91,815	83,58,275
Total No Receipt Transaction in Treasuries	14,68,762	86,291	22,717

Table: Receipts through internet based banking

Financial Year	Number of Internet based Transaction	Amount Collected (Rs. In Crore)
2014-15	5962	8.3399
2015-16	2643452	1119.973
2016-17	359362	4262.563

Total Stamp Paper Generated from May 2015 to Till Date 13,02,618

Implementation coverage

The system is providing service to business houses who ever has to transact with the state finance may it be Government employees, pensioners, businessmen and citizens who is availing any sort of government services. Geographically this system covers all the 21 districts and all the 123 blocks through 22 treasuries, 85 sub treasuries and 13547 DDOs. This system is being used by more than 350000 tax depositors and all the candidates/aspirants who appear for jobs to Haryana State staff selection commission and Haryana Public Service Commission etc.

- Based on the procedure adopted for Non-Judicial Stamp paper, Punjab & Haryana High Court has desired to start generation of Judicial Stamp Papers and integration with their CIS (Court Informatics System).
- Integration with e-KUBER of RBI to get receipts scroll from a single source i.e. RBI.

Outcomes in terms of Efficiency, Improvements and integration

Table: Efficiency improvement

Activity	Time Taken	
	Before	After
MIS Reports	3-4 Months	5-10 Minutes
Stamp Paper Generation	1-2 days	5 Min
Tax Deposit By Commercial Tax Payee	3-4 Hours	5 Minutes
Service Delivery after payment is confirmed	NA	5 Minutes
Processing of Refund	30 days	7 days

Specific innovative ideas implemented

- Integrated with CSC (Common Service Centre) wallet has helped citizen to pay any sort of Govt. receipt and get stamp papers from any CSC in their vicinity has reduced their cost of travel and time.
- Integration with Core Banking Solution (CBS) of various banks has provided facility to the citizen to make payment in cash any branch of SBI, PNB, CBI, SBOP and IDBI bank. It has also reduced wait time and removal of manual intervention at various branches for collecting over the counter payment in cash.
- Avoidance of huge stock of stamp papers by Treasuries.
- Immediate delivery of service by Integrating e-GRAS portal with various departments web API based payment verification.

The extent of integration

- Integrated with portals of major receipt transacting departments such as Revenue , Excise and Taxation, Transport, SSC, Public Health Engineering and Industry
- Integrated with CSC-SPV for online generation of Challan, payment and verification.
- Integrated with Property registration System (HARIS) for online verification e-Stamp.
- Integrated with Web OTIS for accounting receipt received for PLAs and PDAs maintained by treasures.
- Integrated with OBAMAS for finance Secretary Dashboard w.r.t. state receipts.

ENABLER INDICATORS

Process reengineering

Applicant had to procure a Challan From department which in many case was different for different sort of receipts, and need to fill details like Major Head, Minor Head, Scheme code, Treasury, Sub-treasury etc. The same had to be verified from DDO/Treasury Officer. Citizen then used to visit bank and used to Deposit state Receipts. After receiving receipt from bank he had to visit the concerned department to deposit of receipts to avail any service. To provide better services/facilitation to citizen, following processes were reengineered:-

- By eliminating paper based form and bring 100% receipt of the state by online challan.
- Since Challan generation is online, process of verification of classification of account head by DDO/TO is eliminated.
- Citizen has option to pay by Internet banking (without any convenience charges) and can pay by Debit/Credit card by nominal convenience fee.
- Process of Updation of status by bank, in case of online payment is eliminated. In case of offline payments also, status is reported by bank at portal and citizen can check payment status at any point of time.
- Replacing manual CTR verification by Online CTR Verification.
- Online refund application process.
- Online Verification of refunds from receipts.
- Citizen can generate stamp paper online immediately after payment confirmation from bank.
- Maintaining of manual challans by DDO/ TO is no longer required.
- MIS reports for Audit can be generated instantly at portal.

Challenges faced in implementing Process changes

Previously the Finance Department and treasuries in the State Govt. was working on an archaic system. Every department had a challan form, in which applicant need to fill details like Major Head, Minor Head, Scheme code, Treasury, Sub-treasury etc. and got duly verified from DDO/Treasury Officer. Citizen then used to visit bank and submit his challan and after receiving receipt from bank, he used to deposit to department to avail any service. As far as stamp papers are concerned, one could have bought these from stamp vendors, authorized State bank of India

branches or treasury office. In case of SBI, citizen need to deposit payment by Cash or Cheque and he would have got stamp papers from bank. Treasuries used to keep huge stock of stamp papers, which were bought from Nasik and further given to stamp vendors. Stamp vendors used to maintain registers for each stamp paper sold.

The Lessons learnt from the Process re-engineering exercise
- Different types of Challans for different receipts.
- Non Availability of Challan forms.
- Dedicate manpower to assist citizen in challan filling in department and verification of classification of receipts in treasuries.
- Non availability of right information at right place at right time for decision making.
- Problems in reconciliation of accounts as banks were sending physical scroll and treasury officials used to rely on information provided in scroll by the bank.
- Candidates/citizen to various departments used to face problems for verification/ confirmation of payments done.
- Non reporting of receipt by bank to the state treasury.
- Manual handling often led to delay in account preparation.
- No MIS report available for various stake holders.
- Receipts were not being reported to RBI timely leading to improper ways and means position of the state..
- No provision for citizen to generate online challan.
- No provision for citizen to make online payment.
- Fraudulent /Over payments of refund to depositors.
- Citizen's dependency on banks and stamp vendors.
- No check to determine use of stamp paper for more than one purpose.
- Citizen had to make offline application for stamp paper refund to concerned authority.
- Non transparent way of working at field levels leading to confusion, delay and harassment to the public.

Best practices adopted from the industry/ other State implementations
- A data management cell has been created at the Directorate level. A fulltime Joint Director has been posted with one System Analyst and two programmers as technical support personnel.
- Comprehensive FAQ's were designed to answers the most common queries.
- A telephone helpline is available to provide support to the officials
- Video tutorial on How to generate challan and stamp paper released

Leadership, Change Management, Capacity Building during transition
Leadership support for the initiative
- Honble' Finance Minister took keen interest in the project he reviewed the progress of the project at his level. It was at his instance that the e-stamp-paper were made mandatory in four district.

- Finance Secretary has issued strict guideline to the state departments to closed all sort of bank accounts which were being used to park the state fund.

Change management and Capacity building strategy
- A data management cell has been created at the Directorate level. A fulltime Joint Director has been posted with one System Analyst and two programmers as technical support personnel.
- A helpdesk cell was created in the Directorate of Treasury and Accounts department to assist the various departmental officials in implementation of the project.
- Technical support personnel have been provided at each treasury and sub treasury office.
- NIC too has a team of dedicated officers in place for development/ customization, processing and project management as well as technical support.
- One-week computer basics training was provided to the F.D. Officials.
- To kick start the project, state level workshop for BCA/BCO/DDOs was conducted at Panchkula and 2-days training programme was organized for Revenue Department officials and stamp vendors at Panchkula.
- Regular Trainer's Trainings are conducted for TO/ATOs at the state level.
- Regular exclusive workshops were organized for Finance Department.

Project management & Monitoring
A core committee has been set by the Finance department under the chairmanship of ACS (Finance) to regularly monitor the progress of the implementation. A project implementation committee has been framed under the Chairmanship of Director General of Treasury and Accounts .This committee meets every month to take stock of new development or maintenance requirements.

Financial model adopted
The Project has been implemented from state own resources.

Special efforts to ensure sustainability of the e-Governance initiative(s)
To ensure sustainability of the e-Governance initiative following steps has been taken by the government by way of government order
- With NIC Haryana as Technology Partner and in-House development is able to provide the services to various stake holders as per their growing demands.
- State has done away with the manual challan paper and mandatorily preparation of Online challan
- Single point of state receipt,
- No permission for individual department payment gateway integration.
- Stopping of selling of stamps in 6 districts by way of government order.

Challenges faced in transition
- Different types of Challans for different receipts.

- Non Availability of Challan forms.
- Dedicate manpower to assist citizen in challan filling in department and verification of classification of receipts in treasuries.
- Non availability of right information at right place at right time for decision making.
- Problems in reconciliation of accounts as banks were sending physical scroll and treasury officials used to rely on information provided in scroll by the bank.
- Candidates/citizen to various departments used to face problems for verification/ confirmation of payments done.
- Non-reporting of receipts by bank to the state treasury.
- Manual handling often led to delay in account preparation.
- No MIS report available for various stake holders.
- Receipts were not being reported to RBI timely leading to improper ways and means position of the state..
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- Fraudulent /Over payments of refund to depositors.
- Citizen's dependency on banks and stamp vendors.
- No check to determine use of stamp paper for more than one purpose.
- Citizen had to make offline application for stamp paper refund to concerned authority.
- Non transparent way of working at field levels leading to confusion, delay and harassment to the public.

The Lessons learnt from Change Management and Capacity building
While interacting with the various users and the training of the official few good suggestion were which were integrated in the system by means of providing new features

- Categorizing the receipt purpose wise so that citizen can pay govt. receipt against a purpose ,which has been mapped to state budget schemes at the , thereby avoiding misclassification state receipt and problems faced by citizen for its correction.
- Facility has been provided to T.O.s for correcting of information supplied by citizen during preparation of challan till the account is not prepared..
- Online cash receipt verification of DDOs.
- Online verification of Status of Challan
- Online re-verification of Payment for failed transaction.
- Comprehensive FAQs has been build for self help of the citizens.
- Videos for generation of Stamp paper have been prepared.

Technology
Technological solution adopted
To provide citizen 24*7 services, adequate infrastructure has been deployed at Haryana State center consisting of two web servers in Network Load Balancer Mode, two database servers in Always on High Availability Mode and two reporting servers in Network Load Balancer Mode.

Compliance of the Technology adopted with e-Government standards

- The site has been audited by CERT IN empanelled third party with industry SSL in place.
- No details of the Credit and Debit Cards is being stored/ captured at the portal to avoid breach in financial credential of the citizens.
- The password is stored in encrypted form and OTP based changed password policy is in place. He Change of password in thirty days has been made mandatory.
- Audit log is maintained as per standards

Strategy for Disaster Recovery and service continuity

To combat natural disasters, primary DR site has been set up at NIC Haryana Data Center, Chandigarh with same infrastructure and servers keeps on synchronizing with each other at regular intervals. Another DR site of NIC is already functioning at Pune, where in back up of primary DR site is dumped every day. Apart from this, regular backups are scheduled on SAN of Haryana State Data Center.

Technology related challenges

Immediate synchronization with DR site was the main challenge. Apart from this the internet banking based fail transactions was the other major challenge.

The Lessons learnt from Technology choices and implementation strategy

By Adopting always on High availability technology of SQL server we have been able to mitigate the first challenge and the second challenge was addressed by real-time payment verification APIs.

VALUE INDICATORS

Digital Inclusion

- To assist the uneducated people the services has been extended through CSCs in assisted mode.
- FAQs has been prepared in Hindi, the most commonly used language in the state.

Green e-Governance

- With the incorporation of internet based payments (Debit/Credit/Internet Banking), no need to print receipt of various payments made to Govt. like Recruitment Fee, Tax Deposit etc. as same is available to concerned department, which saves printing a ton of papers.
- To Promote Green e-Governance, notices are put in Development area, to shut down your computer and turn off Monitor also.
- As per GOI Disposal of ICT Gadgets policy, the vendor who supplies new infrastructure takes the obsolete hardware and disposes as per policy.

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I-Budget: Integrated Budget Application
Finance Department, Government of West Bengal

Puneet Yadav and Mainak Mukhopdhyay

PROJECT OVERVIEW

The very notion of *i*-Budget, which went live from 1ˢᵗ Aril 2014, is based on the sole necessity to strengthen the backbone of the government functioning by providing efficient and easy government services towards budgetary fund allocations & its monitoring thereafter and thereby ensuring better fiscal management and well-organized financial operations of West Bengal State government.

The project is developed as Internet & Intranet based integrated system automating the key aspects of Budget Estimation, Publication, Release, Re-Appropriation, Augmentation, Surrender and Monitoring of Funds & Debt accounts of West Bengal Government.

The intended benefits from *i*-Budget as framed are: (a) To enable the government to monitor the outputs and outcomes of various schemes run by the state government (b) Storing of all the information at a central place for sharing financial and performance information and facilitating convergence of service delivery (c) Comprehensive information systems and database to assist decision support in development ventures and day-to-day management / administration of public spending (d) Enhancing returns and value of benefits to people from development schemes by eliminating misuse/misappropriation of public funds.

The major functions covered under *i*-Budget are (a) Online Collection of Plan Budget Estimation from Administrative Departments (b) Preparation of the Non-Plan Revised Budget of the previous financial year as well as the Non-Plan State Budget for the ensuing financial year through the developed software from the scratch level based on the growth rate and other parameters (c) Timely composition of highly aesthetic and accurate Annual Budget Documents (25 nos.) & Appropriation Bills for presentation at the State Legislative Assembly (d) Management of Release of State Funds and GOI Funds (both State Share & Central Share) (e) Re-Appropriation, Augmentation & Surrender of Budget Allocations (f) Reconciliation of Fund Release & AG Actuals (g) Monitoring of Borrowing & Lending related to Loans & Advances including Public Debt (h) Activities of the various Audit Groups (i) Activities related to Audit Paras (j) Monitoring of Incomes and Expenditure (k) Meeting up the detailed queries & reports as required for the review meetings of Hon'ble Chief Minister, NitiAyog etc. (l) Statistical Analysis, Planning, Forecasting and What-if Analyses from the *i*-Budget Central Repository.

RESULT INDICATORS
Key Performance

i-Budget is developed as an integrated system to render various e-Services pertaining to Budget Preparation, Publication, Monitoring of Funds and Debt accounts of West Bengal Government . It covers the detailed Demands for Grants (Budget Expenditure), Receipts under Consolidated Funds (Budget Receipts),

Receipts and Disbursements under Contingency Fund and Public Accounts. The key components of *i*-Budget are described below:-

Plan Budget Estimation: Requisite application s/w is made available online to facilitate all Administrative Departments to enter head-of-account wise Plan Budget Estimates towards framing of Annual State Budget.

Non-Plan Budget Estimation: Based on the archival data and other aspects as decided by the competent authority, detailed head-of-account wise Non-Plan Budget is prepared using *i*-Budget in scientific manner.

Budget Publications, Appropriation Bills & Other Statutory Reports: *i*-Budget facilitates towards timely composition of highly aesthetic and accurate Annual Budget Documents in statutory formats for the presentation at the State Legislative Assembly. Total 25 numbers of Budget Publications are generated from the system which includes Annual Financial Statement, Vote on Accounts for Expenditure, Summary of Demands for Grants, Receipts under Consolidated Fund, Contingency Fund and Public Accounts, Statement of Gross and Net Expenditure under Non-Plan and Plan Heads, Budget at a Glance, Key to the Budget Documents, Detailed Demands for Grants (Budget Publication No. 11 to 25), Summary for Sector wise Departmental Plan Outlay, Demands for Supplementary Grants. Generation of Other Standard Reports e.g. Appropriation Bills, Reports for Periodical performance review of Administrative Departments by the Hon'ble Chief Minster, Reports for NitiAyog, Finance Commission etc. are generated on a mouse click using *i*-Budget.

Business Intelligence: *i*-Budget facilitates strong MIS support to the Administration. Various structured reports are generated viz. Different Account Head wise Plan & Non-Plan Budget Abstracts, Different Account Head wise Plan & Non-Plan Budget Details, Plan Layout Query, Different Account Head wise Salary & Non-Salary breakups, Plan Sector wise Budget Abstract Report and its comparative analysis, Budget Details under Special Component Plan for Schedule Castes, Financial year wise Budget Analysis for Expenditure, Receipts, Public Accounts and Contingency Fund, State Plan Earmark Matrix, Budget Indicators to generate real-time figures from Budget database e.g. GSDP, at current price, Fiscal Deficit, Debt, Contingency liabilities, Revenue Deficit, State Tax Growth etc. SMS based and Mobile App based support are also made available.

Release of Funds: Once Budget Estimates is accepted by the State Legislature, release of funds is done using *i*-Budget as & when required as per discretion of competent authorities through generation of U.O.

Re-Appropriation, Augmentation & Surrender of Funds: The developed system is proved to be an efficient tool to do the related activities only after ensuring the admissibility. Apart from core Budget S/w, following applications are in place under *i*-Budget. These are:-
- Integrated Debt Management Information System (for better management of receipts & repayments of loans from NSSF, Open Market Borrowings,

RIDF, National Cooperative Development Corporation (NCDC) Loan, Borrowing from Central Government, WBIDFC, Power Bond, LIC)

- Monitoring of Receipts & Expenditure of GOI Funds
- GOI Receipts Confirmation System
- Audit Para Monitoring System
- Rural Infrastructure Development Fund (RIDF) Monitoring System
- Workflow based File & Letter Tracking System etc.

Benefits obtained from these services
i-Budget is primarily a G2G initiative which provides interface amongst officials of West Bengal Government. However, it also provides some G2E & G2C services. All Departments of the State Government., which are of 66 in number, get their financial sanctions instantly, once it is electronically transmitted from *i*-Budget system to IFMS or WFTS by the Budget Branch, Finance Department. About 300 Directorates and over 1000 Regional, District and Field Offices receive all funds from the Department in dematerialized format instantaneously.

Since the incorporation of *i*-Budget in 2014-15, it has been possible to manage the WB State Government Fund & Loans in better manner which resulted in a remarkable growth in State Finance. Following diagrams may be referred to in its support.
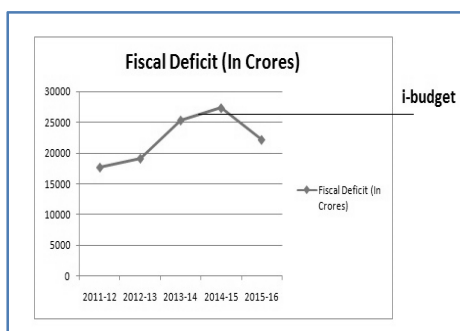
Figure: Fiscal Deficit
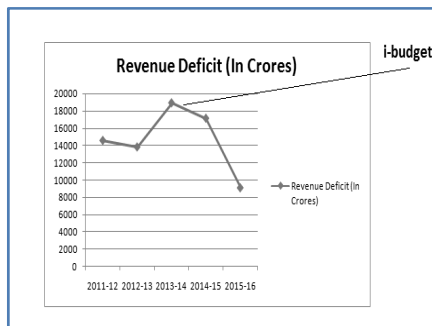
Figure: Revenue Deficit

Real Time Information Availability– *i*-Budget has been able to provide the stakeholders with real time information regarding receipts, expenditure, debt & investment and ways and means position of State Finance to facilitate government-wide and agency specific policy decisions.

Single Source of Truth– *i*-Budget is capturing the data at the source of origin and eliminates data redundancy & duplication of efforts in entry of the same data multiple times in different forms.

Stakeholder Convenience– *i*-Budget has enhanced the convenience of all stakeholders, especially departmental officials, by providing them better facilities and electronically data/ information sharing.

Minimal Reconciliations– *i*-Budget enables automatic reconciliation of Budget Estimates, Allocations and Release of Funds.

Financial Discipline– *i*-Budget facilitates effective financial discipline in terms of more accurate budget preparation and effective expenditure control, effective tracking of scheme-wise and project-wise expenditure, better management of both receipt and disbursement of debts, better cash flow management, etc.

Speed and Certainty in Service Delivery– *i*-Budget is key instrumental in speedy and transparent delivery of services such as fund release and disposal of files.

The performance, efficiency improvement derived through successful implementation of *i*-Budget has significant effect on stiff increase in State Expenditures.

Table: Development Expenditure

Particular	**2012-13**	**2013-14**	**2014-15**	**2015-16 (BE)/(RE)**
Developmental Expenditure (Actuals/BE)	51824.18	57936.08	70672.24	81913.55
Developmental Expenditure (Actuals/RE)	51824.18	57936.08	70672.24	88010.95

In what can qualify as a classic case of how a cash-strapped state like West Bengal can augment revenue without adding to the discomfort of taxpayers, West Bengal Finance Department's *i*-Budget project offers a simple fiscal management system that also help the state to easy fund flow from the top layer to DDOs for executing developmental schemes. Apart from curbing the fiscal deficit, revenue deficit & outstanding debt, *i*-Budget has helped the state to gain a comfortable fiscal position within just 2 years since incorporation of *i*-Budget in 2014-15.

Table: Year-wise wise transaction volumes for various services

e-Service wise Volume of Transactions (Nos) rendered through *i*-Budget		
e-Service Description	**2014-2015**	**2015-2016**
Budget Estimation	3,05,911	4,35,296
Fund Release	62,01,239	71,69,905
Monitoring of Borrowing & Lending	77,122	1,60,078
MIS to Government Dignitaries, NitiAyog, State Assembly House etc.	5,27,939	6,18,720
Portal Hit Count (Intranet)	71,12,211	83,83,999
Portal Hit Count (Internet)	95,46,705	1,01,17,379

Table: File Disposal Volume through i-Budget

	Aug,2015	Sep,2015	Oct,2015	Nov,2015	Dec,2015	Jan,2016	Feb,2016	Mar,2016	Apr,2016	May,2016	Jun,2016	Jul,2016	Total
Receive File	19265	21893	16971	23972	24954	24747	25563	27755	13485	15854	16871	18124	249454
Despatched File	16137	18247	13212	20178	21574	20457	20454	26175	10257	11223	11189	16548	205651
Total	35402	40140	30183	44150	46528	45204	46017	53930	23742	27077	28060	34672	455105

Implementation coverage

The geographical coverage of i-Budget includes all the 20 administrative districts, including the 344 Development Blocks within such districts for Budgetary Allocations of Rs. 1,60,044.59 Crores (Budget Estimate: BE 2016-17) to around 22,000 Schemes/Projects being executed throughout the States of West Bengal by 66 Administrative Departments and its sub-offices e.g. Directorates, District and Field Offices, 88 Treasuries/ Pay & Accounts Offices (PAO), Local Bodies /Panchayati Raj Institutions (PRIs) and more than 8000 Drawing & Disbursing Officers (DDOs), Operators of Local Fund/ Personal Ledgers/ Provident Funds Accounts, 10 lakh employees, more than 6 lakh pensioners, about 10 Lakhs suppliers/ contractors /service providers and around another 30 lakh beneficiaries of stipend, scholarship, social pensions across the state of West Bengal come under the implementation coverage of various modules of i-Budget. Total hit count of the Finance Portal in last 2 years is 19.6 million approx.

Increase extent of coverage: More office nodes are slated to be covered under *i-*Budget. For this, the Government has taken up certain steps in modernizing the mini data centre located at Budget Branch of Finance Department at State Secretariat. The related process is already initiated by the authorities during 2016-2017 in a cost-effective manner. The highlighting features being incorporated are as follows:-

- Latest High Availability-Disaster Recovery (HA-DR) functionality
- Use Always On Availability Group
- No Code changes or configuration changes in case of server failure
- Listener routing implementation
- Use Hyper-V Virtual Machines (VMs)
- Host 2 VMs in each machine: One for web server and another for DB Server.
- CPU for Web Servers and 8 CPU to DB Servers
- RAM – 6 GB to Web Servers and require minimum 8 GB but recommended 16 GB RAM for DB Servers
- Two set Web Servers DB Servers wont have Internet access
- For the rest two servers, one will be used for external facing Web Server and another for Active Directory domain controller
- Failover Clustering

Increase extent of services: The extent of barcode-based tracking would be increased by increasing the number of files with barcodes scanned on them. Further, the note sheets and buff sheets of files which are being generated through *i-*Budget would bear e-Sign.

*Extent of integration of other IT systems with i-Budget:i-*Budget will also be integrated with the computerized system being implemented in the office of the Accountant General (AG), West Bengal for exchange of data.

*Public interface for i-Budget:*More logical extensions of *i-*Budgetare planned to be provided in the system with a public interface which will make it possible for beneficiaries. This will create new benchmark in public service delivery and will

increase transparency, accountability and responsiveness to new heights and will usher in much needed change in reforming public sector governance in the state. This can also serve as an example for other states and also the central government to emulate.

Outcomes in terms of Efficiency, Improvements and integration
With the implementation of *i*-Budget, time and cost efficiencies have taken place:

Table: Efficiency improvement

Indicator	Description	Manual process	*i*-Budget
Transit time	Average time taken for inter-departmental file movement	15 days	1-2 Days
Fund Allotment	Average time taken for allotment and release of funds from the Finance Department	20 days	24 Hrs.

With *i*-Budget, the fund allotment process has got expedited through improved digital linkages between the Finance Department and other administrative departments, which is reflected through a considerable increase in the quantity of funds released as well as an even distribution of release during a given financial year.

Specific innovative ideas implemented
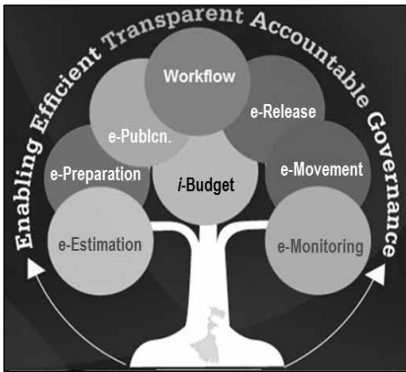
Innovative ideas
- Use of Web based mechanism & Intranet for dissemination of the project ensuring easy access.
- Use of smart pop ups for dissemination of all necessary information.
- Use of smart built in validations in order to ensure compliance to the statute.
- Work flow based processes removing superfluous layers within the administrative process chain.
- Standardisation of processes through built in validation checks minimizing discretionary human intervention.
- Use of BI tools for generation of intelligent M.I.S data.

- Pendency checker for tracking process pendency at all hierarchical levels.
- Online dynamic dashboard for staffs and officers.
- Auto SMS alerts / notifications through Push SMS to stakeholders to expedite the fund release processes
- Barcoding of Files for easy receipt and despatch of files
- Process tracking (status, remark trail) on the click of a mouse.
- Extracting process status information through free SMS Pull service.
- *i*-Budget Mobile App to check the Status of File relating with release of Budgetary Fund Allocations. The relevant screen shot is furnished below.
- *i*-Budget Mobile App to check the status of funds (Budget Provision/ Release/ Balance/ Augmentation/ Surrender) in any particular Head of Account.

The extent of integration
i-Budget is integrated with following ICT systems through Web Services:-
- Integrated Financial Management System (IFMS)
- Workflow based File & Letter Tracking System (WFTS)
- e-Taal

ENABLER INDICATORS
Process reengineering
The BPR towards framing *i*-Budget involved following steps:-
***Base line Study*:** The senior officials of the Budget Branch, Finance department were entrusted to make an analysis of the system requirements. A separate IT Cell was created under Budget Branch and the National Informatics Centre was identified as consultant for the project. Extensive stake holder consultancy was done. The service delivery times for various processes were studied in details and documented. The process flow bottlenecks were identified, Business Process Re-engineering as felt suitable to improve efficiency were prescribed and an SRS document was prepared with the help of NIC.

Capacity Building
The biggest challenge was establishing institutional linkages between the technical team and domain experts. To address this, the Finance Department specially posted an IAS officer of the rank of Secretary to the Government to provide leadership to the team. A dedicated Budget IT cell was created with about 7 senior, experienced and dynamic officers on full-time basis to provide domain support to Technical team and train the master trainers. All the stakeholders were trained at different level locations. Modes of capacity building activities adopted were:
- Master Training to Resource persons
- Class Room Training to Users
- Hands on Training on dedicated Training Server
- Web based Training
- CBT (Computer Based Tutorials)
- User Manual and FAQs

Challenges faced in implementing Process changes

Resistance faced from government officials with limited computer literacy and tech-savviness: With the advent of *i*-Budget, the work-flow process has got entirely digitized, though the physical system of file has been retained for the time being. Government officials who were relatively less tech-savvy and were used to transfer files physically within and amongst departments were apprehensive of the process changes that took place.

Data migration and subsequent integration of record dated prior to 1ˢᵗ April 2014 with i-Budget: In order to ensure continuity in the U.O.No.s of files pertaining to budgetary fund release , the note sheet and buff sheet of files and letters dated prior to 1ˢᵗ April 2014 were digitized by respective government officers and maintained in the soft form. The files generated after the said date were assigned subsequent U.O.No.s in order to maintain continuity with files initiated before.

Lack of a robust information management system: There was no procedure to track the level of progress and implementation or any standardized mechanism for reporting.

Requirement gathering: Requirement gathering was found to be a major challenge as the divergence between the manual and digitized systems of operation was huge. The volatility of the requirements was augmented due to the inadequate computer literacy among the stakeholders.

Besides, in the realm of dynamically changing business process of state fiscal system and with overwhelming data collected as outcome of those processes, it was very difficult to transform the data as business intelligence input to the finance department authorities.

The Lessons learnt from the Process re-engineering exercise

- Changing user mind-sets is a necessary pre-condition before embarking on ICT based process re-engineering.
- Stakeholder consultation during the stages of development and design are essential for easy post-deployment acceptability.
- Effecting change has to be an exercise started from higher up in administration and then down the hierarchical set up.
- Appraising the stakeholders and convincing them of the benefits is more important than just enforcing ICT re-engineering.
- Accessibility, time and locational independence to users is important.
- Taking along users not comfortable with technology by arranging suitable training is essential for universal dissemination.
- Network and Connectivity are crucial and deploying fall back mechanisms as a measure of redundancy is important.
- Piloting and making necessary course corrections from feedback and user experience before final deployment is essential.
- Robust Helpdesk support and round the clock troubleshooting should be put in place.
- Training and capacity building should be a continuous exercise.

Best practices adopted

While conceptualizing *i*-Budget, special emphasis was given to know the best practices in other States of the country in the relevant area and modern technological developments as well. It was decided to focus on developing simple and effective tools and strategies for managing, understanding and executing the present e-government initiative through *i*-Budget. The inference taken from the study of successful e-Governance initiatives in other sectors/States is that a standardized best practice can act as a template for e government services provided at the local and central level of e government. It was decided to use standardized technologies complying with international standards and their interoperability between different systems.

Leadership, Change Management, Capacity Building during transition

The project is being implemented under the able guidance of Sri. H.K Dwivedi, IAS, Principal Secretary – Finance Department, Government of West Bengal and spearheaded by Sri Puneet Yadav, IAS, Secretary– Finance Department, Government of West Bengal. Considering the reach and extent of the re-engineering initiative a separate I.T Cell was created under the Finance Department which is being headed by an officer of the rank of Joint Secretary. Regular review meetings are conducted to discuss the issues – technological & administrative - relating with *i*-Budget to ensure its smooth execution.

Change management and Capacity building strategy

- Support services are made available to all stakeholders through email and over phone (2 nos. 033-22535363 & 2253 5393) by a dedicated help desk manned by experienced software support professionals.
- Resource personnel identified at all levels – including State Secretariat and Department Levels – and trained under the TOT model.
- Regular training sessions at the Conference Hall of Finance Department of State Secretariat and also at other Administrative Departments.
- Hands on support facilities made available throughout by hiring software support personnel.

Financial model adopted

The total cost of procurement, installation and maintenance of computers and peripherals at the Budget Branch of Finance department, from FY 2014-15 to FY 2015-16, have been approximately Rs. 25 lakhs as the existing servers and personal computers of the Finance Department were utilized. To enhance the infrastructure and application longevity to at least next 5 to 7 years, a shift to dedicated Budget Servers is proposed in 2016-2017, including state-of-art ICT infrastructure costing about Rs. 75 lakhs.

Special efforts to ensure sustainability of the e-Governance initiative(s)

i-Budget is driven to achieve operational efficiency and effectiveness in service delivery. To ensure its sustainability, following measures have been taken:-

- Setting up of a separate IT Cell under Joint Secretary (Budget Branch) (a) to find out periodically whether *i*-Budget is delivering the services in right manner (b) to re-examine the budget spending priorities in the realm of

increasing demand of new e-Services, switching over to new technologies etc.

- Periodic Third-party assessment of *i*-Budget and compliance of their recommendations
- Assessment by ADB Consultant (PWC) during 2014-15 for benchmarking IDMS module of *i*-Budget and evaluating project status & road map
- Assessment by Microsoft India in 2016 for benchmarking IDMS module of *i*-Budget and evaluating project status & road map
- Assessment by Cyber Security Division (CSD) of NIC(Hqrs.) and Cert–in certified agency (SRQC) to ensure application level security

Challenges faced in transition

- In order to have sustainable e-Governance initiatives, the challenge before Budget Branch, Finance Department was in bringing a paradigm shift in providing services to the stakeholders of Finance department and all other administrative department. This necessitated attitudinal change, technological skill enhancement, adaptability to respond to stakeholder requirements in ever demanding scenario and commitment to provide superlative services.
- The major challenges in change management before deployment of *i*-Budget were (a) Processes were not streamlined – different processes in different offices (b) IT awareness (c) Risk of IT system replacing manpower (d) Fear of using system and working on system (e) e-Services awareness (f) Risk of information loss (g) Process simplification and re-Engineering – communication.

Capacity Building Challenges

Imparting training and capacity building was a major challenge for *i*-Budget owing to several issues. Staff members were used to the manual way of working and resistance to accept processes after GPR came from the employees who were nearing their superannuation. Skill sets required to handle IT systems were limited. Trained officials and also officials holding various authorities in the computerized business process workflow are often transferred or retire. This in turn necessitated repetitive training leading to delay in implementation.

The Lessons learnt from Change Management and Capacity building

- Motivation plays an important role in bringing about change in mind-sets and accepting change.
- Peer learning is important and goes a long way in bringing about change.
- Selecting the right team leaders is essential for driving change.
- Appraising the benefits to all stakeholders, especially the end users, is important before process re-engineering.
- Initiative and perseverance of the top management is necessary to bring about major process changes.
- Training has to be a continuous exercise with hands-on workshops.
- Technology enables SMART (Simple, Moral, Accountable, Responsive & Transparent) goal setting for the officers and employees to facilitate and

support better planning and decision making. It is an enabler and motivator for improved output.

Technology

i-Budget is made available at www.wbfin.nic.in. To maintain confidentiality of Budget Estimation data and security of State Plan and Non-Plan releases, some part of project is made accessible from State Budget Intranet only. The project is based on inter-operable, browser based application. The application complies with Interoperability Framework for e-Governance in India (IFEG). The technological aspect datasheet of *i*-Budget is as follows:-

- *Browser based Application. Accessibility:* Platform & Browser Independent. Security Standard followed: OWASP
- Built with .NET Framework 4.0. SQL Server 2014 as backend Database. Open Source Reporting Tool ITextSharp
- Web Server: IIS 7.0
- *Network facility*: The Government Offices across the State connect *i*-Budget modules which are available in State Finance Portal using WBSWAN, State-owned MPLS and Leased Line/Broad Bands/Data Cards.

Strategy for Disaster Recovery and service continuity

IDC, Shastri Park, New Delhi where WB State Finance Portal is hosted, has Disaster Recovery facility with DR sites located in NIC, Hyderabad. Asynchronous replication over WAN using FC-IP protocol and seamless connectivity with DR site over 34 Mbps leased line minimizes any negative impacts to *i*-Budget operations. Apart from this, the intranet based s/w modules hosted at the mini data centre at Budget Branch of WB State Secretariat are in a highly secured environment, where all the security policies are under implementation. N/w Monitoring S/w (NMS) is in place and firewalls are functional.Always-On methodology is implemented here at both Application & Database level to ensure service continuity.

Technology related challenges

- Imparting training and capacity building was a major challenge for the department owing to logistic issues. Further, staff members were used to the manual way of working and there was an initial resistance to accept process changes. Skill sets required to handle IT systems were also rather limited. This in turn necessitated repetitive trainings, leading to delay in implementation. Implementing software functionality within a very small time period across locations with high number of users also proved to be a challenge.
- Challenges of bulk data capture on Actual Expenditure from AG, West Bengal has been overcome through exchange of data in electronic formats.
- Lower bandwidth & intermittent Internet connectivity and interrupted power supply in different office locations spread throughout the State
- Difficulty to transform data as business intelligence input to the state finance authorities in the realm of dynamically changing business process of state fiscal system and with overwhelming data collected as outcome of those processes

- Providing Seamless e-Services to thousands concurrent Stakeholders 24x7
- Providing multiple real-time transaction status reports as various levels

VALUE INDICATORS

Digital Inclusion

Introduction of *i*-Budget has resulted in the following positive externalities in the area of digital inclusion:

- In *i*-Budget project, no such hindrances have been faced yet. Cultural, language and demographic differences do not apply here as Budget preparation, publication, fund release and other related operations are basically G2G operations and is conducted mostly in English.
- On one hand, the government functionaries carry out most of their budgetary functions in English, while on the other hand, the beneficiaries too, get SMSes in English from the system stating the budgetary fund release file disposal information. Besides utility Mobile Apps too serve the stakeholders in English language.
- Efforts have been made to make the interface user friendly with online user manuals available for each process re-engineered.
- All officials have been provided username/password on their mobile/email to enable them to work with *i*-Budget. However, the authorization to certain modules has been restricted to officials of certain levels. Nonetheless, this has ushered in digital inclusion process and all employees have been co-opted as part of this grand transition to a modern digital environment.
- Trainings and workshops have been organized to bring all employees on term of skill sets on the use of ICT are being ironed out. This will pave the way for a fully modern workforce that is geared to meet newer challenges of governance involving greater use of ICT in the coming days.
- A conducive environment has been created through planning as well as written directives to make usage of *i*-Budget mandatory across all concerned departments.

Green e-Governance

- Obviated the need for taking print outs by ensuring easy retrieval of data at any time through electronic information management system
- Online collection of Budget figures from administrative departments, its estimation & finalization thereafter and availability of budgetary fund release orders in dematerialized form to all stakeholders has substantially reduced use of papers.
- Previsioning of annual budget publications (both receipts & expenditure) online and thereby substantial elimination of printing of those documents every year for distribution among stakeholders has led to huge savings printing costs.
- Complete elimination of inward & outward registers through online system has led to huge savings of paper, cartridges and printers.

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iBhugoal-Roads
Rural Works Department, Government of Bihar

Vinay Kumar and Shailesh Kumar Shrivastava

Project Overview

The main aim of the Project is to establish "Bihar GIS" as a tool to represent resources (Natural as well as manmade) of Bihar for location specific planning, decision-making and monitoring. Project envisages establishment of Bihar State Spatial Data Infrastructure for Multi-Layer GIS for planning and e-governance by taking advantage of existing & available data and ICT infrastructure involving various stakeholders in State of Bihar. It is noted that there has been no concept of spatial data inventory or SDI (Spatial data Infrastructure) in Bihar. There were scattered efforts from the officers at different departments to map the existing MIS data and other infrastructure using drawing tools in computer, for their reference. These are available in bits and pieces and lie with departments in different formats. These data and maps however do not conform to any mapping standards and also there is no such policy at present within the state, which defines the standard procedures of mapping and their maintenance. The main drawback of such practice is that, integration of these maps is not possible. Such practices also fail to reflect the current functional status of infrastructure and the services on the ground to the administrators at higher levels to make strategic and informed decisions. In turn large investments are incurred to answer specific queries frequently made from various apex forum and internal planning. More so, results may also vary for similar queries raised at different points of time. It was felt that introduction of GIS technologies will bring in focus existing spatial reality which will lead to dynamism and transparency in the nature of working, in order to overcome problem issues related to planning, development monitoring & decision-making. Establishing GIS system for data organization and management for existing infrastructure and its coverage, with appropriate technology framework and standards may go a long way in reaping benefits of collaborative dynamic environment and may lead to large scale benefits.

E-governance emphasize on all aspects of monitoring and evaluation, physical and financial planning, management of social and physical infrastructure, and enhancement / restructuring of existing facilities, facility management. In all these areas, there is a special emphasis on spatial dimensions. Geomatics, is the synergy of multiple disciplines, has evolved as a separate discipline dealing with spatial and non-spatial information, its method of acquisition, organization, classification, analysis, management, display and dissemination. It provides not only the answers for macro-level planning but also state-of-the-art models to the government in the context of decentralized planning for sustainable development in rural areas. The present work focus on developing a WebGIS integrated framework for planning infrastructural facilities upto village level. The infrastructural facilities considered at village level include educational and medical facilities, anganwadi kendras, Rural roads at different levels etc. The spatial utility maps for infrastructural facilities existing at village level have been created using GIS. The spatial gaps in the existing facilities have been examined to plan for the new facilities. Hence, GIS / GPS/ Remote Sensing based project for Bihar Infrastructure Mapping with the following objective has been implemented:

- Creation of Digital Spatial Database
- Creation of primary layers and ability to generate the required number of secondary layers and generation of composite maps from those layers.
- GIS analysis using state of art technology
- Generation of Location-Specific Thematic Maps.
- Action Plan Maps for location specific problem solutions.
- Development of an appropriate GIS - based Query System.
- Appropriate methodology for collection, collation, storage and processing of data on natural resources in a given region & in totality.
- Standardized formats for natural resources and socio-economic data in an integrated manner to establish linkage among various hierarchical units
- To utilize information for planning and development.
- Evaluation and monitoring of various schemes activities.
- Keep ahead of the maintenance curve.
- To develop a methodology for state-wide monitoring considering time and economic feasibilities.

Project envisages objective of establishment of "Common Central ICT/GIS Server Infrastructure & Services for Bihar State" for planning and e-governance by taking advantage of existing & available data and ICT infrastructure resources involving various stakeholders in State of Bihar.

RESULT INDICATORS
Works Completed as part of project deliverables

- Development and implementation of WEBGIS portal for Bihar for hosting GIS applications
- GIS mapping of rural roads has led to release of Rs. 7600 Crores to Bihar under PMGSY.
- Digitization of NH, SH, Major District Roads on 1000 scale has been completed.
- Digitization of Rural Roads [PMGSY] on 1000 scale has been completed for all districts of Bihar as per specification of NRRDA. Integration of Key Indicators has also been done with maps. This includes preparation of CN1 and CN6 sheets which is being attached with applications. This involves around 1,08,000 habitations and 70,000 Roads
- Urban Boundaries i.e. Ward Boundaries of six cities has been integrated with the system.
- Digitization of Forest cover has been started with discussion with forest department. Classification of forest cover and other parameters are being carried out.
- Irrigation Canals, Rivers, Streams on 1000 scale has been completed and integrated with the Bihar GIS System.
- Identification of 31,000 tola not connected through any road under GTSNY(Gram Tola Sambadh Nischay Yojana)

Key Performance
Service G2C:

- Geographical Maps of State, District, Block, Panchayats.

- Bihar ATLAS containing various thematic maps.
- Road and Habitations details of Selected Area
- Urban Boundaries of Major Cities of State
- Integration of GIS maps with on-line GIS Services such as Google, Bing, ESRI etc.
- Profiles of Rural Roads regarding Physical and Financial progress.
- Monitoring of Road Construction across state
- Monitoring of Construction bridges across roads
- Integration of various MIS data for on-line Queries.

Services G2G:
- Digitization of Rural roads to cover 100 and 250 population in Naxal affected areas and 500 population in other areas
- Road profile and progress monitoring of physical and financial targets.
- Creation of Core Network for agriculture transmission line of electricity.
- Creation of Core Network under Mukya mantri Gram Sadak Awasesh Yojana.
- Major District Roads under Public Works Department.
- Forest Area mapping and identification of Forest Reserve.
- Mapping of Rivers, Canals, Streams for Irrigation and Flood Management.
- Generation of on-line thematic maps based on MIS data.
- Spatial Query facility based on spatial data and MIS data available.

Table: Year-wise transaction volumes for various services

Sl. No.	Services	2015-16 (Till Date)	2014-15	2013-14
1	PMGSY Roads	8,40,000	7,50,000	7,30,000
2	Major Roads	10,03,000	16,00,000	10,53,000
3	Habitation	1,08,000	1,08,000	1,03,000
4	MMGSY Roads	8,00,000	6,70,000	4,10,000
5	GTSNY Roads	4,00,000	3,00,000	----
6	SMS Support	10,30,000	9,00,000	8,40,000
7	Helpdesk/Grievances	20,54,000	13,44,000	6,54,000

Implementation coverage
- 38 districts of Bihar
- 534 Blocks of state of Bihar
- 8463 Panchayats
- Departments such as Rural Works Department, Irrigation Department, Public works Department, Public Health and Engineering, Bihar Education Project, State health Society, Forest, ICDS, Urban Development etc.

Description of the new services
- Mobile based monitoring system for PMGSY road and integration with road inventory at OMMAS software of Minitry of Rural Development.

- GIS based Road network as service to different departments
- Mobile based monitoring system for MMGSY roads and integration with road inventory.
- Mobile based monitoring system for GTSNY roads and integration with road inventory.
- GIS based analytics for Rural Roads Sector.
- GIS based core network for NALI-GALI Yojana under Mukkyamanti seven Nischay programme.

Outcomes in terms of Efficiency, Improvements and integration
- Reduction in data management effort with standardized practices in place.
- Scientific planning of resources and road infrastructure using GIS technology has resulted in reduction of biasness.
- Real-time on-site monitoring of activities at various project sites has improved quality of inspections.
- Online Reporting for various formations for the organization helps to take efficient decisions
- Integrated planning of activities related to Road administration.
- Improved grievance redressal system and maintenance of Rural Roads.
- Identification of Unconnected Tola which need to be given road connectivity
- Various analytics reports can be generated through the system regarding progress of road project progress.

Specific innovative ideas implemented
- Integration of Geo-spatial data and MIS data of different departments
- Integration of SOI maps with online map services such as Google, Bing, ESRI etc.
- Query facilities for Planning and decision making by departments
- Facilitates efficient & effective tool for planning rural road connectivity to habitations.
- Helps in better management of facilities such as Schools, Anganwadi Kendra, PHCs etc.
- Helps achieve transparency & easiness in planning & monitoring processes.
- Efficient updation of thematic maps
- Smooth Management of Election process through proper use of GIS maps
- Offers scientific approach for irrigation facilities planning

The extent of integration
- National GIS framework at NIC having "Spatial Data Infrastructure for Multi-Layer GIS" is the service oriented architecture over which "Bihar infrastructure Mapping Services" is being customized as web –based GIS services for various stakeholders.
- Use of Census 2001/2011 location codes so that as per e-governance standards applications can easily be integrated.

- The application involve creation of spatial layer of different parameters with desired attributes at top of "Base Map Service" leveraged by NIC as "Image Based Web Service" to the authorized and registered State Government Department
- Access of customized spatial data service for different State government authorized user groups for viewing, and data creation & updates with due validation & authentication process.
- Customization of front-end application for Bihar Government user group.
- Web Based MIS system for attribute data entry and its validation & update and report generation.
- Application Software for spatial & non-spatial data integration in customized web GIS service environment.
- The GIS services under this project assist the planners and administrators in following ways to understand and get prepared to the situations arising out of operational planning, decision-making and development & monitoring needs:
- Knowledge dissemination,
- Operational Management & preparedness
- Resource mobilization in the event of service failure
- Delivery mechanism for development services, etc.

ENABLER INDICATORS
Process reengineering
Implementation of the iBhuGoal was not without hurdles. The NIC and the Rural Works Department, Govt. of Bihar faced several roadblocks during the introduction and implementation of the iBhuGoal project. These were both institutional as well as operational issues.

Co-ordination among Stakeholder Departments
Gathering and organizing data from the priority departments for spatial and infrastructural mapping to create an asset register for the entire state was an uphill task. To make this spatial data accessible on a centralized portal required complete coordination between all the departments and this is always a very painful process. It may take another 2-3 years to complete the project with current scope.

GIS technology for Top level decision making
iBhuGoal is the first ever GIS project implemented in the state of Bihar. Prior to the iBhuGoal project, the concept of spatial database did not exist in Bihar, and both the knowledge and awareness of spatial dimension in decision-making was absent. Hence, selling this idea to the top administration of the state required quite an effort. Top administrators took their time before they were convinced that GIS-enabled tools can be really effective in decision-making on infrastructure, policy and state matters. The team successfully overcame this challenge by demonstrating its effective functionality in the concerned departments.

Creation and Storage of Spatial data of departments
Prior to the iBhuGoal, most of the data records were maintained manually. Though, some departments adopted the MIS format. Still, records were not maintained digitally. Each department had its own way of managing data. The team, therefore, faced an arduous task of streamlining the processes of each department and organizing the digitized data under a centralized web portal, iBhuGoal. Thus, organising data from various departments, converting large volumes of manual data into a standard digital format and carrying out spatial mapping required a continuous and sustained process discipline where co-ordination among different departments was an important issue.

Issues related to making project Operation
The cost effective functioning of the project within a stipulated timeframe required easy access to technology and adequate technical know-how. In terms of access to technology, the team faced some operational issues related to the hardware:

- Life of the GPS devices battery and its portability during village surveys was quite problematic.
- In remote villages and districts, receptiveness of people towards GPS mapping and support in terms of logistical issues and information was crucial. People were not very receptive and forthcoming in giving accurate information in remote areas.

The team was successful in mitigating all these issues and challenges. Some creative solutions were worked out by the team. For example, the GPS mapping device is pre-loaded with verification and authentication tools. If an official is conducting a GPS mapping of anganwadis with this tool and has been misinformed with contradictory information, then the GPS system would check for fallacies and update the existing gap in information automatically

Leadership, Change Management, Capacity Building during transition
- Major policy formulation has been done through the department.
- Support from the top level management to ensure sustainability
- Availability of a geo-spatial database
- Funding support for project
- Creation of ICT support structure across organization
- Inter-operability between applications and data.
- Comprehensive capacity building for stakeholder acceptance
- Common platform for effective data sharing between departments
- State specific policy and shared vision among all stakeholders
- Champion driven projects
- Continuity of thought over a long period of time period
- Support for the project from highest level for implementation of the project.
- Project has been identified as flagship programme of state.

Change management and Capacity building strategy

A desktop GIS roll out program using Open source GIS products has been undertaken for identified sections/division in the state department where there is need to sensitize the staff in respect of GIS concept and process data as per the local needs. The ease of use of GPS for data collection had changed the entire philosophy of data collection and requisite skill set shall be developed. A three level training Master trainers to actual management can be taken up from State to the Block level for using GIS in decision making and enabling of GIS culture in government functioning.

Training & Capacity Building

- State GIS Core Team: NIC, Bihar and Information Technology Department, Government of Bihar has notified officers as Project Members of Bihar GIS team. This also have members from Central GIS team from Delhi, who advices and assist during project implementation. This team is supported by a team of programmers well versed in adopting GIS for applications and providing technology implementation of the Project. A set of data entry operators at least one for each department has been hired at GIS Core Team. This team has been assisted by officers looking after different Sectors of State government. This team work under overall supervision of Secretary, Rural Works Department, Govt. of Bihar and State Informatics Officer, Bihar. Central GIS team New Delhi organizes training on GIS tools for the team and do hand holding of the project.

- User Department Core GIS team: In order to support project at department level it is necessary to create and train a group of resource persons who can work at department level and integrate MIS applications with GIS. User department has formed a cell with hired manpower and domain experts. These people have been trained on GIS Applications by Central Core Bihar GIS team. These people not only co-ordinate with Bihar GIS team but also interact with field formation for collecting MIS data. These sectorial data is being updated at regular interval by this cell to GIS Server. Departments are also advised to hire expert manpower for digitizing maps depending on requirements. In addition the cell can motivate decision makers to use GIS in decision making process and create a GIS enabled environment for planning and monitoring.

- Resource Persons at District level: In order to support project at district and Block level large chunk of data has to be uploaded to department level at regular basis. Kind of Parameters required at decision making has to be identified by the district. It must be clarified entire MIS data should not be ported on to the GIS server rather only such data which has location importance and which is needed for planning and monitoring. Nodal officers have identified at district and block level who co-ordinate for data at district level and also all the data which are being collected must contain census codes. District officials dealing with data have been trained and equipped both for uploading data, data standardization and also they can use GIS as a tool for decision making. Proper h/w and software

infrastructure has been created at field formations for updating data and viewing maps.

- Workshops on adoption of latest technologies: Workshops have been conducted for various stakeholders of the project to make them understand about available GIS technologies and best practices   In order to support project at district and Block level large chunk of data has to be uploaded to department level at regular basis. Kind of Parameters required at decision making has to be identified by the district.

Project management & Monitoring

Following committees have been created by Rural works Department and Information Technology Department, Government of Bihar for monitoring long term objective and progress of the project.

- State Level Apex Body**:** This has been constituted under chairmanship of Chief Secretary, Bihar with Principal Secretaries of Departments such as Rural Works, Forest, Water Resources, Rural Development, Urban Development, PHED, HRD, Social Welfare, Information Technology, State Informatics Officer, NIC, Bihar as members.
- State Level Steering Committee: This has been constituted under chairmanship of Secretary, Rural Works Department, Govt. of Bihar with GIS Nodal Officers Departments such as , IT, Forest, Water Resources, Rural Development, Urban Development, PHED, HRD, Social Welfare, Information Technology, Two Representatives of districts and GIS Co-ordinator, NIC, Bihar as members.
- District Level Executive Committee: This has been constituted under chairmanship of District Magistrate of respective district of Govt. of Bihar with GIS Nodal Officers Departments at District Level such as Rural Works, Forest, Water Resources, DRDAs, PHED, HRD, Social Welfare, Two Representatives of Blocks and DIOs of NIC as members.

Financial model adopted

The project has been implemented in collaboration with NIC, Bihar State through NICSI (National Informatics Centre Services Incorporated), a section 25 company under NIC, Department of Information Technology, Ministry of Communications & IT. This is to facilitate appropriate provisioning of outsourced services required for the project. However, NIC is single point coordination for project development & execution for the State Govt. Government of Bihar has sanctioned Rs.1.98 Crores for execution of the project for two years.

Special efforts to ensure sustainability of the e-Governance initiative(s)

iBhuGoal has made Bihar the first Indian state to have maps of up to population habitations upto 250 persons in the scale of 1:4000. Metcalfe Law would operate on this initiative. More people having an access to it would result in better acceptance level for it. Higher the impact of iBhuGoal, greater would be the demand for it. Currently, areas where the system has been used very successfully or are being contemplated to be used in future. The state has already funded the project for implementation across all the departments.

Challenges faced in transition
The selection of ICT systems and tools should be based on long term strategic and business continuity perspective. The following factors were critical in ICT implementation:

- Adoption of open architecture and adaptive communication network based on proven standards and specifications
- Consistent infrastructure for data collaboration, communication and interoperability
- Authentication and role-based access to the network
- Robust and scalable architecture to support large volume of transactions
- 3-tier architecture for easy modifications of business logic and SW deployment
- Availability of internet connectivity in rural areas
- Platform-independent application components for easy migration to new platforms
- Disaster Recovery and Continuity Planning

Globally ICT is being used to enable operations at a transaction level thus providing advantages like inbuilt process controls, workflow enabled transactions, single point of data capture and support for timely strategic decision making. On the other hand, the core operations are still manual and therefore face issues like ad-hoc decision making, poor data quality, long decision making cycles and under utilization of IT investments. Therefore, ICT has to be selectively adopted as a business strategy to improve commercial and operational performance. The need is to develop a synergy between ICT and the Road Sector; and emerging technologies can play a defining the role in quality of services.

The Lessons learnt from Change Management and Capacity building
- There is need to automate the processes and the processes should be notified at regular basis.
- There should be continuous monitoring of events and activities from top level management.
- The choice of technology should be well tested as it may take much longer period to shift from one platform to another.
- Open platform should be promoted with proper inter-operability framework.
- Hybrid model of outsourcing and in-house management is necessary for large projects.

Technology
Software Development Platform
- Visual Studio .net 10.0 with .NET Framework 4.0 AND C# and JavaScript
- MS-SQL Server 2008
- Arc GIS Server 2010
- Arc Map
- IIS Web Server 7.0
- Apache Web Server

- Google Earth
- Microsoft Silverlight
- Survey Of India Toposheet Service of NIC
- Google API for on-line access of Google Service
- Bing API for on-line access of Bing Service
- XML and Service Oriented Architecture
- On-line Web Application http://gis.bih.nic.in/ can be accessed from any internet node, SWAN node.
- Open Software Architecture support any client browser.
- Operating System - Windows 2008 Server/Windows XP SP2
- Web Server - IIS 6.0
- Software Platform : ARC GIS 10, .net Platform with MS-Silverlite
- Unicode - INDIC IME
- Geo Database with MSSQLSERVER 2008

Compliance of the Technology adopted

Adoption of open architecture and adaptive communication network based on proven standards and specifications. Geomatics–based Application Model for Planning Distribution of Road networks to Rural Entities is enterprise internet-based G2C/G2G decision-support system based on Service Oriented Architecture, which has access via intranet/ internet for authorized users. Geographic Information Technology has developed at a remarkable pace over the past two decades and will play a key role in development. Now time has come for all decision makers to discuss the appropriateness of GIS technology and its applications to rural development, forest management, urban development planning, land information systems and agricultural development. This will also provide a suitable solution for the use of GIS for educational infrastructure development with special emphasis on rural sector. A Geographic Information System (GIS) is proven technology that has been in use for several decades by many government agencies and other organizations as a decision support tool and information management system. GIS provides the capability to collect, manage, manipulate, analyze, and distribute information that is tied to a location, and it layers that information in a map-based environment to provide a better visual image of location, patterns and relationships. GIS is enabling and core technology that touches numerous business processes, systems, data, and other applications. As such, it is an integral part of the computing infrastructure that contributes to the success of service delivery and operations. Standard security standards and as specified in e-Gov standards are being followed and application has been security audited.

Strategy for Disaster

The site has DR site at Hyderabad connected through 1GBPS leased line and it is also planned to create near DR centre at Patna itself.

Technology related challenges faced

The following factors were critical in ICT implementation:
- Adoption of open architecture and adaptive communication network based on proven standards and specifications

- Consistent infrastructure for data collaboration, communication and interoperability
- Internet connectivity at remote locations
- Battery backup of devices
- Large number of SMS and availability of Mobile Devices
- Training large number of people
- Validating spatial data and QC checking
- Authentication and role-based access to the network
- Robust and scalable architecture to support large volume of transactions
- 3-tier architecture for easy modifications of business logic and SW deployment
- Platform-independent application components for easy migration to new platforms
- Disaster Recovery and Continuity Planning

The Lessons learnt from Technology choices and implementation strategy

iBhuGoal-Roads required both spatial and non-spatial data. Spatial data identifies the geographic location of features and boundaries such as hills and oceans and is stored as coordinates and topology. Non spatial data, on the other hand, refers to tabular or attribute data and has no specific location in space although it can have a geographic component and be linked to a geographic location. In Bihar, spatial data did not exist prior to the implementation of the project. Non-spatial data existed only in the form of MIS data from certain departments. In addition, many attributes that were necessary for the database were missing. All of this data was generated by the team. The cost effective functioning of the project within a stipulated timeframe required easy access to technology and adequate technical know-how. In terms of access to technology, the team faced some operational issues related to the hardware:

- Life of the GPS devices battery and its portability during village surveys was quite problematic.
- In remote villages and districts, receptiveness of people towards GPS mapping and support in terms of logistical issues and information was crucial. People were not very receptive and forthcoming in giving accurate information in remote areas.

The team was successful in mitigating all these issues and challenges. Some creative solutions were worked out by the team. For example, the GPS mapping device is pre-loaded with verification and authentication tools. The project has helped in getting social change and reaching to the unconnected society which was prevented earlier.

VALUE INDICATORS
Digital Inclusion

In order to make application reach to masses local language interface in Unicode has been added so that information so provided can be used by large set of people. Applications are accessible both for citizen and for government functionaries as per needs. Application has been hosted on internet to facilitate large number of public

to access the services. Easy navigation facilities, help files make it accessible to larger audience.

Green e-Governance

Following measures have been taken for green e-governance

- The project has tried to popularize its motto of **"THINK BEFORE PRINT - save trees" among stake holders and citizen.**
- Mobile app has been provided for most of the enquiries and grievance redressal.
- Special care has been taken to reduce number of maps which can be printed.
- Special training sessions are conducted for participants on Green ICT and its impact.
- Adjust settings of IT systems to save power when not in use for short periods.
- SMS alert and Online enquiry is being promoted rather than printing paper outputs.
- Use virtualization on servers, when available, to allow multiple operating systems to run on each machine.
- Web GIS application can reduce printing requirements as most of the dynamic map requirements are serviced through Application itself.

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Mabhoomi (A Public Portal for Land Records Information)
Chief Commissioner of Land Administration, Revenue Department
Government of Telangana

Satya Sharada and M. Nagaraju

PROJECT OVERVIEW

Land is a fundamental asset for people in India. About 70% of the population is dependent on agriculture for their livelihood. There are 83,89,375 Pattadars are existing in Telangana State. Securing land rights and modernizing land administration are crucial to the progress of any Society or Nation. Land administration is an important tool for ensuring socio economic justice and improving living conditions of farmers and those dependent on Agriculture land. The crucial aspect of Land administration is maintenance of land records up to date and reflection to the ground position. Erstwhile, in the state before Webland initiative, the entire Land Records data was centralized at each Mandal office and the data was maintained at local offices only. There was no authentication process for access of the data to the data owner and following were the issues with system:

- Manual records
- Data insecurity
- Fake Pattadar passbooks
- Duplicate beneficiaries
- Fake registrations on Land
- Citizen inconvenience due to multiple visits to government offices.
- No proper grievance mechanism
- Data inconsistency
- Manipulations
- Malpractices

In the year 2011, the land records data which was available in each Tahsildar office was verified, corrected and digitally signed using Digital Signature Certificate (DSC) and the same data was ported to State Data Centre. Land inventory of 4 crore survey numbers have been uploaded to the State Data Centre. A web based application named Webland was developed for efficient management of land records and it is integrated with MeeSeva Portal to issue ROR IB and Pahani copies as Across-The-Counter services to the citizen. Now the "Webland" called as "Telangana Land Records Management System (TLRMS)" is an official land record management website of the state of Telangana, designed with an objective to maintain Land Records and make available with updated information regarding Survey No., Khata No. extent, land classification, land usage and other land related details upto subdivision level to the citizens. The same records are made available in Mabhoomi portal for free access to citizen through web site with an Objective to provide online comprehensive information of Land Records to the public, Mabhoomi Website has been opened to the Public through www.mabhoomi.telangana.gov.in on 17th February 2016 by Hon'ble Deputy Chief Minister and Minister for Revenue. This website provides a platform for the citizens across the globe to view the land related information like Pahani, Record of Rights-1B (ROR-1B), Tippon and Village Map of any district, any mandal, any village of Telangana State.

RESULT INDICATORS
Key Performance
This Website facilitates the following provisions to all the Citizens.

- *Personal Pahani***:** Pahani of a Pattadar can be viewed based on selection survey number, khata number, Aadhaar number and Pattadar name.
- *Village Pahani***:** Pahani of entire village of a selected district and mandal can be viewed.
- *Personal ROR-1B*: ROR-1B of a Pattadar can be viewed based on selection survey number, khata number, Aadhaar number and Pattadar name.
- *Village ROR-1B*: ROR-1B of entire village of a selected district and mandal can be viewed.
- *Aadhaar Linkage*: Pattadar can verify the linakge of Aadhaar number to the Land Records. If not they can enter the Aadhaar number bu uploading the scanned Aadhaar card.
- *Tippon***:** Tippons of survey numbers in a village of a selected district and mandal can be viewed.
- *Village Map*: Digitised cadestarl village maps can be viewed. Village maps on Bhuvan portal also can be viewed.
- *Grievance Registration*:Any individual aggrieved, can register their Grievance, if there is any error or mistake in their land records
- *MIS Reports:* MIS related to Crop data entry, Mutations and other reports enabled in Mabhoomi portal.

The Mabhoomi portal was launched on 17th February 2016 and the numbers of records viewed by the public are as follows:

- Total Visitors: 17,58,824
- Personal Pahani viewed: 31,92,018
- Village Pahani viewed: 5,31,763
- Personal ROR-1B viewed: 10,46,710
- Village ROR-1B viewed: 1,27,637
- Aadhaar linkage status verified: 92,567
- Tippons viewed: 1,96,289

In the earlier system, the department officials had to process the applications with the manual system and verify the records every time when required and have to enquiry at the field level. New system has enormously reduced the administrative burden of Government officials. Department functionaries are now processing the requests by using their secured digital tokens and with this system there is no chance for data tampering. The key beneficiaries with this system are citizen. Citizens have been benefitted with the reduced visits to government offices, accuracy on the data and were also saved from the financial expenses. Citizen need not to go for government offices multiple times to know status on grievance which reduced corruption as well. Other Departments are in the process of integration with their database with the land records database, so as to identify genuine beneficiaries in different beneficiary schemes. Data is shared through dynamic Web services and

main satisfactory factor for all the stake holders is the process avoids manual verification and high accuracy is maintained regarding beneficiary identification.

Implementation coverage

Mabhoomi portal is a State level application pertaining to 443 Mandals of 9 Districts of Telangana State. "Telangana Land Records Management System" is an official land record management website of the state of Telangana, designed with an objective to maintain Land Records and make available with updated information regarding Survey No., Khata No. extent, land classification and usage and other land related details upto subdivision level to the citizens. The same records are made available in Mabhoomi portal for free access to citizen through web site. The comprehensive reach of the data delivery is throughout the world. Delivery of service is facilitated directly through website i.e., user can view or print the desired record anywhere across the world, if he is provided with Internet connectivity and also through the 4472 MeeSeva Centers (Kiosks) the same data has been delivered in the form of digitally signed certificates.

The main objective of Mabhoomi portal to provide one stop solution for Land Records information. The process of purification of land records is under process in the Districts to deliver quality information to the public. The old land records registers are scanned and will be ported to State Data Centre and will be made available to public through Mabhoomi portal.

Outcomes in terms of Efficiency, Improvements and integration

- Delivery of service is facilitated directly through website i.e., user can view or print the desired record anywhere across the world, if he is provided with Internet connectivity without visiting Government offices or any MeeSeva kiosks. Before initiating this project, 1 99,81,190 transactions for Pahani copies and 39, 69,116 transactions for ROR-1B copies have been received through MeeSeva centers. The total amount submitted by citizens as user charges is approximately Rs. 59.87 Crores. Now using Mabhoomi portal land records information is opened to public at free of cost.
- Citizens are verifying the land records information from Mabhoomi portal. As on date 17,58,824 people accessed the Mabhoomi portal and verified their Pahani's. Some of the citizens found mismatch in their land records. In view of this CCLA has instructed all filed officials to verify all the records and update the corrections online in TLRMS (Webland) portal. As on date special character rectification in 42191 survey numbers, 72867 Pattadar names, 14347 Occupant name are completed. 90802 base year records are corrected. 24572 mutations updated into online system. Based on the feedback being received on Mabhoomi the Land Records database is purifying.
- Telangana Land Records Management System (TLRMS) of Revenue Department is integrated with CARD system of Registration Department to curtail bogus registrations and to initiate the Mutation process automatically for the registered cases. TLRMS also integrated with Banks so as to create loan charges on land records so as to curtail multiple/bogus loans on lands/crops. TLRMS also being integrated with Agriculture

Department for providing crop subsidy, crop damage other benefits to the actual beneficiaries.

ENABLER INDICATORS
Process reengineering

Before TLRMS (Webland) initiative, land records in Telangana were available in respective all Tahsil Offices in a decentralized mode. Software version control was a problem. It required Oracle database licenses for each Tahsil office. There were no tools to monitor to accuracy of the data. No technical persons were available at Mandal level. No uniform Land codes were adopted by Tahsildars. Data was not reusable and not interoperable with other departments' data to overcome these challenges the web land has been designed with idea of delivery of citizen centric services and entire database has been ported to State data centre which is located in the SHQ with the digital sign of concerned officer. To deliver services related to Land Records to citizens Across-The –Counter from MeeSeva Kiosks using databases digitally signed by the competent authority and for easy maintenance of land records by Revenue Department, now in the era information to all the government has decided to open the digitally signed data to the public through online gateway and implemented with the "Mabhoomi" any of the citizen can visit the website and verify the land records. The following Challenges have been faced in implementing the Process changes:

- Porting of land records data into a centered server at State Data Center from the all Tahsil Offices which are in a decentralized mode.
- Purification of land records.
- Integration with other Departments like Registration, S&LRs and other Departments to provide land records related services to public through a Single Portal.

Citizens are verifying the land records information from Mabhoomi portal. As on date 17,58,824 people accessed the Mabhoomi portal and verified their Pahani's. Some of the citizens found mismatch in their land records. In view of this CCLA has instructed all filed officials to verify all the records and update the corrections online in TLRMS (Webland) portal. As on date special character rectification in 42191 survey numbers, 72867 Pattadar names, 14347 Occupant name are completed. 90802 base year records are corrected. 24572 mutations updated into online system. Based on the feedback being received on Mabhoomi the Land Records database is purifying.

PKI Component using for two factor authentication, encryption and Digital Signing. Aadhaar based bio metric authentication is also implemented for changes in the Record of Rights.

Leadership, Change Management, Capacity Building during transition

- The Government of Telangana vision is to leverage the Information Technology not only for effective and efficient governance, but also for sustainable economic development and inclusive social development. The Government in Revenue Department initiating various e-governance projects under leadership of Chief Commissioner of Land Administration. The training sessions have been conducted from Revenue Divisional Officer level to the level of Village revenue Officers time to time on the

new modules released to the Districts to improve the efficiency and effectiveness in utilization of IT applications for quality delivery of services to the citizens. Project Monitoring Unit (P.M.U) team has been established at SHQ which coordinates on the grievances received from public with the department and development team to rectify the grievances.

- The services being delivered through the Mabhoomi portal are at free of cost to the citizens. The portal was developed by Office of Chief Commissioner of Land Administration with the help of National Informatics Centre Telangana. The certified copies related to land records are being issued through MeeSeva through Public Private Partnership model. Rs.25 Lakhs given to NIC towards software development and man power recruitment.
- Latest database technologies in terms of high availability and real time replication of the data are implanted for the sustainability of the project. Responsive UI is implemented to disseminate the information across multiple devices. All the departmental staff are trained through video conferences and training sessions on grievance redressel mechanism. The citizen's privacy and security are not compromised at any stage through use of Aadhaar number and system generated grievance number.
- It is observed from the implementation of IT projects that the services are being delivered in a transparent manner and the progress is achieved in a short time compared to the manual process. With these advantages Department has decided to provide Tablet PCs to Village Revenue Officers for effective usage of ICT in implementing the IT projects.

Technology
The hardware and software details are as follows:
- **Web Server**:
  http://mabhoomi.telangana.gov.in:
  Make and Model: Dell power edge R520
  Processor: Intel Xeon CPU E5-2420 @1.90GHz ,1900 Mhz, 6 core ,12 logical processors.
  OS: Windows Server 2008 R2 Enterprise 64 Bit
  RAM: 64 GB
  Application S/w: Microsoft Visual Studio 2008
- **Data Base Server** :
  Make and Model : HP prolient BL 460cG7
  Processor: Intel Xeon R CPU E5630 @2.53 GHz, 2533 Mhz 4 cores ,8 logical processors
  OS :Windows server 2008 R Enterprise 64 bit
  RAM : 64 Bit
- XML Web Services
- Android based tools for viewing of land records by citizens
- PKI Component using for two factor authentication, encryption and Digital Signing for security of data. Aadhaar based bio metric authentication is also implemented for key changes in the Record of Rights

- All servers Hardware, Networking devices, Data Bandwidth used from State Data Centre (SDC) Resources. All hosted applications and Database backups are taking regular basis and moved to tape media with retention policy of 45 days period.
- After the launch of the Website state wide publicity was done through social media, news articles, etc, Awareness created in the public regarding benefits of the website.

Challenges faced while integrating the Revenue and Registrations land records to automate the process of Mutation after Registration. The nomenclature of survey numbers in two systems is different and a successful mapping algorithm is developed to convert the survey numbers in English to Telugu.

Government started leveraging technology to computerize the manual Land Records that led to the implementation of reforms in the existing system. For effective management of land records and to deliver land related G2C services to the public and also to keep land records up to date "Webland" was launched. After successful launch of Webland, it was noticed that there are several discrepancies in the Web land data compared to the field data since the data in Webland was ported from LRMS (Land record Management system) data. Further, there was delay in update of records. Instructions were issued to the field level functionaries from time to time on the steps to be taken for updating the land records.

VALUE INDICATORS
Digital Inclusion

- Agriculture farming in Telangana is undergoing several changes with large number of farmers, both big and small, are switching over or other professions and white collar jobs, whereby actual cultivation of the lands is taken up by the tenant farmers whose names remain unrecorded whereby such cultivators are not eligible for institutional finance and a range of other public benefit to such as compensation in the event of natural calamities, input subsidy such as seeds, subsidized fertilizers, pesticides and implements, crop insurance etc., since these benefits go to the registered owner of the land. Hence these cultivators are eventually driven into the informal credit market which supplies loans at very high rate of interest which greatly adds to the cost of cultivation. To overcome this issue the Government of Telangana is issuing Loan Eligibility Cards to the farmers who raise their crop with express or implied permission of owner or Pattadar of Land, but have no record for such enjoyment without effecting the rights of the owners enabling them to access credit from public financial institutions and to claim benefits of input subsidy, crop insurance, compensation for damage. Now the issuance of LEC certificates is integrated with Land Records database so that the owner of the land cannot take loans on the total land owned by him.
- In some cases sale transactions take placed in the state on unregistered documents and their names are not updated in Revenue land records due to which they are unable to get any benefits from the Government / financial institutions. The Government decided to regularize these un registered documents without paying the registration fee for the benefit of small and

marginal farmers up to an extent of 5.00 Acres through an IT based system to bring their names in the column of Pattadar in online records.

Green e-Governance

As the Land Records Management System is integrated with Banks and other financial institutions. Steps are being taken so that public will not submit the certified copies of land records for availing the benefits from the various institutions as the land records information is available online on the Mabhoomi portal and any one can verify the authenticity of land records online. This system of approach will reduce of the paper.

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VarnijYakar Automation System (VYAS)
Department of Commercial Taxes, Government of Uttar Pradesh

Mukesh Meshram and Saurabh Gupta

PROJECT OVERVIEW

VYAS (VarnijYakar Automation System), an integrated e-Governance solution for Department of Commercial Taxes, Uttar Pradesh has been developed with a vision to provide effective and efficient system of collection of taxes based on progressive use of Information technology and to ensure an environment which is congenial for prospering of Trade & Commerce in the state of UP. Department is the highest revenue-earning. Around 47,690 crores revenue earned in the year 2015-2016, this is the 60% of the total revenue of the State.

Taxation Acts in State: a)UP VAT Act 2008 b)Central Sales Tax Act 1956 c)Tax on Entry of Goods in UP Act 2007.

VYAS has two major categorization of inter-related web applications based on the functioning of the department:

- Intranet webs on various automated services – Single sign-on for officials
- Online services for around 11 lakh registered Dealers – TIN based login

Salient Features of VYAS are:

- Role based, Office work-flow based centralized web VYAS-Vanijyakar Automation System [Receipt Acknowledgement, Registration, Amendment, Dealer Transfers, Suspension, Restoration, Cancellation, Enforcement (Panji5-Record of Detention Memo ,Mobile, SIB) Operations & Control System, E-Assessment (Notices & orders), MIS] is available in Vyapari Suvidha Kendra, built at 1349 sector offices at 95 locations in 75 districts of UP in VPN (Virtual Private Network) environment.
- Online services like e-Return Filing, e-payment, e-Forms Downloads, E-Pargaman, E-Sancharan, E-Registration, E-Amendment, MIS Reporting System on all automated service, E-Services Portal for dealers are available on Internet 24 x 7 anytime from anywhere.
- Facilitation Centre – 255 & Community Service Centers(CSC)–38000 for E-Return & e-Registration
- First state in the country to have automated online assessment of dealers along with issuance of automated orders and notices, increasing the citizen centricity.
- Roll out/implementation model has been Study, Development, Testing, Pilot implementation and then Rollout.
- Communication and dissemination strategy and approach used is Web Portal of Department of Commercial Taxes, Regular Dealer Workshop, Officers Training/ workshops, Messages/ Information through email and SMS.

RESULT INDICATORS
Key Performance
  Government to Citizen (G2C)

- E-Application for Registration
- Availability of Forms, Submission of

- Issue of Registration Certificate
- TIN Verification
- Portal Service with All notifications, rules, acts and amendments
- Acknowledgement/Receipt through front office
- Registration of Dealers
- Tax Payment and Refunds ,Filing of Tax Returns
- Control Room for Public Grievances

Forms, Applications etc.
- Audit/ Assessment - Selection of Dealers for Audit based on risk assessment parameters, Issue of Notices
- Status of Registration/ Tax Payment/ Returns/ Assessment/ Audit, Dealer Profile
- Enquiry and status of application through SMS

Government to Business (G2B)
- E-Application for Registration, On-line issue of Registration Certificate
- filing of return
- submission for utilization of Central Forms
- Payment of Tax
- Application for refund of Tax and Refund
- TIN Verification, Verification of CST forms
- Department Portal Service

Government to government (G2G)
Exchange of information with:
- Directorate of Treasury & Accounts, Govt. of UP
- Excise Department, Govt. of UP
- Finance Department, Govt. of UP
- Commercial Tax Directorates/ Departments of other State Governments
- Income Tax Department, Government of India
- Service Tax Department, Government of India

Result Achieved
Dealer convenience:
- Quite a significant portion of citizen, doing business, referred as dealer is the main focus of Computerization activities of Department of Commercial taxes. Dealers in UP have been facilitated with 'Vyapari Suvidha Kendras' in 1349 sector offices at all 95 locations in UP, which proves to be one-stop facility centre for all trade related services under one roof.
- With the E-Registration, a dealer can apply for registration anytime, anywhere.
- With the designed PDF offline Tool for E-Registration, applicant can fill up the form offline electronically with ease in any number of sittings, bring it to a place with internet facility and can submit the form with a single click.
- With adopted process of E-Registration, applicant gets the acknowledgement slip instant the time it sends the form by clicking on submit button. Hearing Date, the time applicant needs to visit with the fine printed application form gets conveyed to him via acknowledgement, SMS and email also.
- Dealer has access to helping documents to fill the application on website.
- Alerts are made to fill mandatory details, valid date, text, number formats for concerned field entries so as to reduce the chances of errors during form filling.

- Dealer can use the 24 x 7 call centre, available for help & enquiry.
- An Applicant can submit all the required documents online for various services. Once applicant's form is complete with all related documents attached, its application is moved to the sector offices electronically by next day. Applicant gets SMS and/or email at each action, taken by the office against its application.
- Provision has been made for applicant to track the status of it application online.
- Number of visits to the office reduced from many to one or two in order to get the Registration Certificate.
- Once Registration process completes, TIN (Tax payer Identification Number) is conveyed to registered dealer via SMS & email & Registration Certificate is sent by post.
- Dealer can file its returns online 24 x 7 anytime, anywhere.
- Dealers can make the payments online
- Dealers need not visit the sector offices and wait in queue for having various trade related forms. They have got provision for downloading e-forms online on Internet.
- Dealers can view trade activity with the commercial tax department like application receipts, return filing, forms downloads, notices/orders issued to him, status tracking of amendment application etc on E-services portal for dealers.

To organization
Speed, 24 x 7, neatness, accurate dashboard based MIS reports in time

To citizen
Speed, 24 x 7, neat certificates, status tracking, anytime, anywhere.

Implementation coverage
- Centralized work flow based web application, accessible on Internet to all around eleven lakh dealers, number increasing day by day in 38000 CSCs (Community Service Centers), 255 facilitation centers in 305 Tehsils, and 835 blocks in 75 districts of Uttar Pradesh state.
- It is accessible at all urban and rural cities across the Uttar Pradesh State.
- Around Twelve lakh dealers and three lakh transporters using the services via 255 facilitation centers, 38000 CSCs and village level entrepreneurs over Internet.

Outcomes in terms of Efficiency, Improvements and integration
Time taken to process transactions
At present with the integrated Web solutions performance on major functionalities of the department are as follows:

Table: Time take to process transactions

Service	Tasks involved	Time Taken
Dealer Registration	5	1-2 Days
Registration Amendment	5	2-3 Days
TDF Generation	2	10 min.
Returns Filing	2	10 min.
Forms Downloads	2	15 min.
Assessment	5	1 Day -Notice/Dealers available online on dealer's dashboard as soon as it is generated. The same is conveyed via SMS and email on registered mobile and email account.
Detention Memo Generation	2	Via SMS Fetched via PULL SMS and is conveyed to concern via SMS.

Specific innovative ideas implemented

- **Enforcement (Mobile,SIB,Pnaji5) OCS -** When Mobile Squads of the Department catches some suspicious vehicle , they generate unique Detention memo number via PULL SMS built in the Panji5 – Record of vehicle detentions, module under Enforcement Operations & Control System. Also **QR code** has been used on eSancharan and all automated trading forms which covers Dealer details and commodity details carried by the transporter to ensure the validity
- **E-Assessment -**(Notices & orders) is one of its kind automation for the Department, Uttar Pradesh is the first state in the country to generate online orders & notices in format which not only includes relevant mandatory fields but also flexibility to generate even bigger orders through Offline tool.
- **E-Registration –**PDF forms have been designed and developed as offline tool for E-registration application, a dealer can apply electronically from anywhere any time.
- **E-Amendment** – XML and web services have been used extensively for transferring data from one automated service to another under the projects.
- **E-Payment** – Integration with Payment gateway of 13 Banks with integration with U.P. Treasuries.
- **E-Return filing–** Microsoft Excel sheet with VB.Net, a windows application, as offline tool for validating and uploading of various annexure including all sale/purchase invoices for E-Return Filing.
- **E-Sancharan** – 1. Generation of intermediate token to get a single form filled in by intermediate stakeholders seller, purchaser and transporters before the generation of E-Sancharan no. 2. Use of google distance API for calculation of distance between source and destination station for validity time for a certain E-Sancharan form.
- **E-Paragaman** – Check posts have been demolished since 2009 and this application is taking care of around 12000 transit vehicles per day passing

through the states. Forty Two entry and exits point Incharge are conveyed about each transit via SMSs and emails.

The extent of integration
- Integration with Banks, SBI MOP for Netpayment
- Integration with other states for sharing Transit data and eSancharan data via webservice for states Delhi, Jharkhand, West Bengal and Uttrakhand etc.
- Other States reports have been prepared for Delhi, Jharkhand, West Bengal and Uttrakhand as a separate tab on VATMIS for Transit data and eSancharan data.
- Integration with NSDL for sharing Dealer database for verifying trade related forms and for PAN verification of dealers
- All district magistrates have been provided with login/password for viewing Recovery Challan Details.

ENABLER INDICATORS
Process reengineering
- Dealers in UP have been facilitated with 'Vyapari Suvidha kendras' in 1349 sector offices at all 95 locations in UP under the Department, which proves to be one-stop facility centre for all trade related services under one roof.
- With the e-Registration, Now a dealer can apply for registration anytime, anywhere.
- With the designed PDF offline Tool for e-Registration, applicant can fill up the form offline electronically with ease in any number of sittings, bring it to a place with internet facility and can submit the form with a single click.
- Dealer has access to helping documents to fill the application on website.
- Alerts are made to fill mandatory details, valid date, text, number formats for concerned field entries so as to reduce the chances of errors during form filling.
- Dealer can use the 24 x 7 call centre, available for help & enquiry.
- Provision has been made for applicant to see the status of its application on website also.
- Once Registration process completes, TIN (Tax payer Identification Number) is conveyed to registered dealer via SMS & email and Registration Certificate is sent by post.
- Once registered with Commercial Tax Department, A dealer is eligible to explore various applications like E-Return filing, Forms Download, Net-payment, E-Sancahran etc specially designed for dealers' use. This innovative approach towards use of IT in dealer community saves its time and increase the satisfaction level while receiving neatly printed certificate, related documents, easy and prompt amendment in Registration, information about any registered dealer.
- Dealer can file its returns online 24 x 7 anytime, anywhere.
- Dealers can make the payments online.

- Dealers need not visit the sector offices and wait in queue for having various trade related forms. They have got provision for downloading E-forms online at home on Internet.

Challenges faced

- Understanding Manual field level Business process – Getting inputs from departmental officials in terms of automation of the manual system and their expectations from the system. Understanding roles and jurisdiction of various level officials on certain functionality.
- Attracting, developing, and training certain group of Departmental officials as IT Team for enabling them understand IT and think their department's functionality in terms of computerised system.
- Software development in such a manner that work-flow, roles/ jurisdiction, authorisation of various level officials is maintained without disturbing the way they use to work in manual system.
- Implementation challenges had been disinterest, lack of computer training among field level officials who simply use to sign the documents in manual system.
- Security and privacy of different data as officials used to share their login/password with operators.
- Poor clarity and predictability of corporate goals/directions in terms of various modules, automated and hence automation had to go a number of iterative prototypes before going to final workable model.
- Meetings, dealer workshops, trainings are conducted on regular basis and accordingly dealers/officials suggestions/feedback are incorporated in the system, if required and agreed upon by the department. Hence this project maintains and boosts the working satisfaction level in the dealer community and thus sustainability is ensured.
- Challenges with the changes in any IT System are inevitable. Department has created a systematic structure to ensure that changes to system are done after proper analysis and with due authorization from concerned authorities.
- A Committee has been constituted to evaluate the changes suggested by business users from across the field offices. Further, the changes in acts/rules/forms are done in consultation with IT Wing so that the new provisions are IT-friendly and dealers/taxpayers do not face problems in using the IT System.

Best practices adopted
Stake holders inclusiveness and participation

- Meeting with dealers organizations, IIA, CII, FICCI, Advocates, CA, CS is conducted frequently at Commissioner's office.
- Weekly meetings are carried out by Commissioner with Departmental Project team and NIC team involved in project.
- The program steering group is a body chaired by the Chief Minister of the State and is responsible for providing the overall vision, broad policy

direction and guidance to the State e-Governance Road map (eGRM) and also review progress of the State under the eGRM.

- The State Apex committee is a body chaired by the Chief Secretary of the State and is responsible for allocating State level resources, set priority amongst projects and resolve inter-departmental issues.

Industry best practices, standards followed

- Undertaking e-Readiness assessment of Departments
- Setting up of Virtual e-Governance Forums
- Assessment of e-Projects
- Study of best practices for e-Governance
- Development of e-Governance National Resource Database
- Newsletters on e-Governance, workshops/ seminars/ Conferences,
- Setting up e-Governance forum for NGOs, Private Sector, Academicians
- Setting up of Training Institutions
- Create awareness through different media like films.
- Software Security Audit Standards have been followed.

Leadership, Change Management, Capacity Building
Leadership support for the initiative

- Regular weekly meetings/ discussion with review committee under the chairmanship of Commissioner.
- One steering committee under the chairmanship of Chief Secretary, UP has been formed for discussing pros & cons for finalizing any automation under MMP prior to its implementation.
- A number of discussions/meetings held with each of the 16 banks namely State Bank of India, Punjab National Bank, Allahabad Bank, Bank of Baroda, Bank of India, Syndicate Bank, Union Bank of India, Central Bank of India, Indian Overseas Bank, Vijaya Bank, UCO Bank, Dena Bank, Corporation Bank, Canara Bank, Bank of Maharastra, Oriental Bank of Commerce, for Integration with their payment gateway to start E-Payment facility to dealers.
- While the Department has an IT System in place for its business operations, it has not stopped at this stage. With the continuous support of senior leadership of the state at all levels, it has ambitious plans for taking its e-governance initiative much ahead and provide better and effective services to both internal and external stakeholders like Dealers, Citizens, Commercial Tax Department, Banks, Treasuries, Commercial Tax Directorate/ Department of other State Governments in India, Income Tax Department, Government of India, Tax Consultants, Department of Information & Technology, GoUP, VLEs (Village Level Entrepreneur)
- Expansion of e-Services:
- Expanding the network of banks available for making e-Payments
- Expansion of Electronic Interface for Payments Processing with Major Banks that are authorized for CTD Payments
- Creation of system for allowing Certified Tax Practitioners / Tax Consultants to file returns on behalf of dealers

- Creation of e-Amendment System
- Reduction in human intervention in day-to-day taxation operations to the extent possible
- Support Services for various IT Components for smooth running of operations Reduction in human intervention in day-to-day taxation operations to the extent possible
- Support Services for various IT Components for smooth running of operations
- Department has created a modern, state-of-the art infrastructure keeping in view the long term objectives of business and IT enablement. The State Data Centre of Govt. of Uttar Pradesh has been utilized and department's infrastructure has been commissioned there and SDC has its own Disaster Recovery Site.
- There is a well equipped Computer lab having 30 Systems. Faculty gives its best to the trainees and syllabus covers various topics of the present scenario so as to bring our trainees at par to the computer savvy personnel.

Change management and Capacity building strategy

- ISO certified Training Institute to provide Class room and Hands on training to Department Officials/staff. Decentralized approach to provide Regular training at different locations
- Guidelines, ReadMe, PowerPoint Presentations, User manuals for each automated services has been provided on Web.
- Department issues circulars for directions on various automated functionalities of the Department.
- Time to time various GOs and circulars are approved by the State Apex body, chaired by the Chief Secretary of the State, are issued for enabling automation of various trade related functionality of the commercial Tax Department.

Project management & Monitoring adopted

- Service delivery channels -Web, email, PUSH & PULL SMS.
- Online feedback and online Grievance Redressal mechanism.
- Accessibility (Time Window)- Services in offices 10 AM to 5 PM & online services 24 x 7.
- Deliverable services are available to dealers at home on internet.
- Facility for online/offline download and online submission of forms
- Application Status Tracking – anytime anywhere.
- Web Applications have been security audited by Third Party 'CyberQ Consulting Private Limited'
- Digital Capture of the Assessment Process information
- Digital Capture of the Additional Demand Booked and their collection
- Efforts towards Increasing the efficiency, transparency and accountability of the Assessment Process
- Efforts to make proper, efficient and effective use of the limited Human resources

- Efforts to reduce Paper consumption and to move towards a paperless office.
- Android App for Dealer Search – for searching a particular registered dealer of Uttar Pradesh on the basis of its registered TIN, Name or location. However the complete site is fully responsive site.

Financial model adopted
Self-financed initiative (Department of Commercial Taxes, Uttar Pradesh)

Special efforts to ensure sustainability of the e-Governance initiative(s)
- An assessment Report of the Online services under Mission Mode Program of Commercial Taxes Department of Uttar Pradesh. – Third party user satisfaction survey done by Industrial & management Engineering Department, IIT Kanpur.
- Post implementation Online Feedback and Grievance Redressal option is available.
- Meeting with dealers association is conducted frequently at Commissioner's office.
- Weekly meetings are carried out by Commissioner with Departmental Project team and NIC team involved in project.
- In order to identify the needs of the users regular meetings are held at the Head quarter, Zonal and Regional level with Dealer Organizations, IIA, CII, FICCI, CAs, CS.
- An assessment Report of the Online services under Mission Mode Program of Commercial Taxes Department of Uttar Pradesh. – Third party user satisfaction survey done by Industrial & management Engineering Department, IIT Kanpur.
- VLEs (Village Level Entrepreneur) for filling up different trading forms for dealers.

Challenges faced in transition
- Commercial Taxes Department has laid significant stress on capacity building for successful implementation of VAT-IT.
- The sustainability with regards to organization is ensured by providing enough stress on training & capacity building:
  - *Training Sessions*- Formal training sessions on different modules of VYAS, Enforcement OCS, E-Assessment, VYAS MIS, Appeal applications have been imparted to officials belonging to different levels of organizational hierarchy. Training objectives and contents are defined and customized as per the user's level in organization hierarchy.
  - *Application Demonstrations* – Application and web portal demonstrations have been organized for the business users at various intervals to communicate and showcase the system functions.

- *Hand Holding* – Business users are provided hands-on training where they are actually mentored for using the system for their business activity. Proper training environment is created by simulating the production scenario and the hand holding is provided in this training environment. Business users like NSDL and Facilitation Centre and CSCs (Common Service Center) are assigned sample exercises and tests based on cases pertaining to different business processes. Training faculties help the users to execute these tests and exercises.
- *Seminars & Presentations* – Selected business users are invited for brainstorming sessions, seminars and presentations where the domain specialist share their views and deliberate on various administrative, and operational issues related to the project implementation.
- *Educating Dealers* – Application provides comprehensive and detailed handbooks for each of the e-services used by the dealers on the web portal. Apart from them the web portal provides e-documents related to all the forms, acts, rules, circulars, notifications, amendments, etc which can be downloaded from the portal.

The Lessons learnt from Change Management and Capacity building:
Sustainability of the reforms will depend upon how well the overall change culture is maintained.
- A vision for change is a necessity for program design and implementation;
- Enthusiastic leadership committed to change from the beginning provides vision and legitimizes change;
- Advisory boards of stakeholders are necessary to ensure that plans and strategies have the full support of stakeholders;
- Having project IT team embedded within the bureaucracy builds rapport and teamwork;
- Data Sharing between independent departments and other states increase efficiency;
- Facilitating linkages with dealers and other stake holders builds confidence;
- Systematic and constant training that involves the spirit of change as well as technical aspects creates satisfaction as well as efficiency;
- Department should have its own Team of Officials, involved in IT initiative for automation of various departments' functionalities.
- Infrastructure to facilitate intra-netting among different divisions of department is a necessity, and
- Training in the use of infrastructure is a solid basis for IT & Department functionaries' interaction and having its own IT enabled Training Institute has helped the department tremendously in computerized System Implementation

Technology

- Microsoft SQL SERVER 2008 R2, IIS 7.0 Web Server, Visual Studio 2010, .NET framework 4.0, Windows Server 2008 R2, SQL Server clustering, Load Balancing, Blade Servers, VPN, Fibre Cable Network, Intel® Xenon® cpu X5650@2.67 GHz
  (Virtual Machine 1- 4 LP 12 GB RAM,
  Virtual Machine2 -4 LP 12 GB RAM,
  Virtual Machine 3-4 LP 12 GB RAM,
  Virtual mm-24 GB each),
- Client - Windows 7 and above
- Browser - IE 8,9, Chrome
- Microsoft SQL SERVER 2008 R2,
- IIS Web Server,
- SDC has its DR at Pune.
- Visual Studio 2010

- .NET framework 3.5
- Windows Server 2008 R2,
- CA tools for performance monitoring ,
- IBM BI tools(COGNOS)
- Data Centre at SDC (State Data Centre),
- VPN for operations from 1349 sector offices at 95 locations in UP. Dealer end applications on Internet.
- Backup Data Centre at Commercial Tax Department Head-Quarter & Regular backup is taken in Tape Library.

Strategy for Disaster Recovery
- Data Centre at SDC (State Data Centre), VPN for operations from 1349 sector offices at 95 locations in UP. Dealer end applications on Internet.
- Backup Data Centre at Commercial Tax Department Head-Quarter & Regular backup is taken in Tape Library. SDC has its DR at Pune.

Technology related challenges
- Sustainability of software is affected by both technical and non-technical issues. Technical issues tend to focus on how reusable the software is - i.e. its potential for adaptation - while non-technical issues include how a project is governed and funded.
- *Easy, Fast and secure Software Development* - Software has been developed using reusable classes and libraries which can be incorporated in any software modules and can be used by any development manpower without exactly knowing inside coding of the classes and all the system documentation work is done side by side so the change in development outsource manpower does not affect the implementation or sustainability of the automated system.
- *Data Security & Hardware Resizing according to Data Growth* - The project has its own Data Center at SDC (State Data Centre) which is owned by the State Government. SDC has got redundant Power backup, cooling and network Infrastructure to support the Data servers, Web servers & overall networking under the project to provide efficient environment for successful implementation of the project. Time to time

hardware resizing and maintenance carried out so as to manage ever increasing data volume and net load on the web applications.

- *Security Threats in Automated System* - Security measures have been taken into consideration during software development and security audits have been done on frequent basis so as to save the system and data from internet vulnerabilities. Captcha, digital signature, data encryption, QR code etc have been implemented in software.
- *Continuous Software Maintenance/ Enhancement* - Work flow based software has been designed after the recommendations of department's officials as per the practical needs of department various tasks and dealer community as well. Also the software is tuned/ modified time to time as per the hour need of officials and/or dealers.

The Lessons learnt from Technology choices and implementation strategy

- Managing new technology requires a thorough understanding of business technology management.
- Managers must understand how to achieve internal efficiency by applying new technology to operational processes.
- Businesses should create strategic business units focused solely upon managing a company's technological strategy.
- Keeping pace technologically requires extensive research & strategic analysis of the potential value of acquiring innovations.
- Implementing new technology requires retraining staff and eliminating the natural friction that results from making operational changes.
- Managers should be aware of the value in research, development, and forecasting future technological innovations to keep ahead of the competition.
- To decrease the Business Impact Risk, special workshops are conducted time to time and Facilitation Centers, Vyapari Suvidha Kendra have been enabled with help counters for dealers.
- To decrease the Management Risk: Department's officials' and staffs' motivation or willingness is a must in helping the software development team, Monthly meetings are conducted for field level officials for ensuring their participation in IT enabled system.
- To decrease the Development Risk, Weekly IT meetings are conducted with different divisions of the department under chairmanship of Commissioner, Department of Commercial Taxes, UP to have discussion on Input/ Output requirements for automated system.
- To decrease the Employee Risk, Training sessions/workshops are conducted time to time whenever a new feature/facility is launched in automated system.
- To decrease the process risk, IT team involves in meeting/ discussion/ workshops related to s/w development.
- To decrease the product size risk, Product / storage size is analyzed every year and mandatory arrangements are made.

- To decrease the network risk, 24 x7 helpline and network monitoring team has been deployed that look into network problems at distant location and take necessary remedy for problem issues, if any.
- To decrease the technology risk, since the technology changes rapidly, it is important to pay importance to this risk and upgrade the software with new technology time to time.

VALUE INDICATORS
Digital Inclusion
- There is provision of taking biometrics of dealer & business partners during Enquiry for Business Registration. During registration dealers' PAN is validated via web-service from NSDL -National Securities Depository Limited
- At Office applications Employee code of officials as login & respective password is required for authentication & authorization as features in s/w based on its provided role.
- At Dealer end, registered TIN as login & respective password is required for on-line services
- Digital Capture of the Assessment, Enforcement, Registration, Returns, Net-payment, Forms- downloads, Transit, Enquiry, Surveys etc. Process information
- To Increase the efficiency, transparency and accountability of various functionality of the Department.
- To make proper, efficient and effective use of the limited Human resources
- To reduce Paper consumption and to move towards a paperless office.
- Online availability of various MIS reports for effective monitoring
- Format makes the Registration Certificates, Notices/Orders preparation easy, neat and reiterative tasks are eliminated.
- Automatic maintenance for different registration, assessment, enforcement related registers at a click.
- Almost 360 degree work of the Department's functionality has been automated so overall system proves to be efficient, time-saving, better management and analysis of digital data collected from various web applications for the department and dealers use.

Green e-Governance
E-Assessment (Notices & orders) is one of its kind automation for the Department, **Uttar Pradesh is the first State in the Country** to generate online orders & notices in format which not only includes relevant mandatory fields but also flexibility to generate even bigger orders through Offline tool. Technologically, Microsoft Word Template as offline tool to write the 40-50 pages long notices/Orders and on uploading the same, combining it as running text in HTML during Notices/Orders generation on the fly in ASP.NET Programming, was new that has been incorporated in the system. This solution was widely accepted and E-assessment could be a success in real time.

As an another leap towards Green Governance, Department now deciding upon having all the trade related documents, provided to dealer, digital signed and thus making sending signed documents by post, an old tale of the past. Direct Cost saving in terms of paper under various modules.

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Citizen Friendly Services of Transport Department (CFST)
Transport Department, Government of Telangana

Sandeep Kumar Sultania and B. Venkateswarlu

PROJECT OVERVIEW

The e-Governance initiative of the Transport Department was initially started in early 90s (1992) with an intention to digitize the records and to attend certain citizen services through computers. As the time goes, the initiative has strengthened and with the help of technology extended all the services to issue through systems (1999-2012). In the year 2008 the department has successfully implemented the Pilot Project, the latest state of art technology (Centralized architecture – 3-tier) in 4 Districts of the State. The project was completely rolled out to entire State during 2012-2013 in phased manner. The Project is sustained for more than a decade, thanks to Government, allowed the Department to charge nominal value added Service Charge to Citizen to improve the quality of service by upgrading the required latest technical infrastructure by placing the old, to ensure a quick and transparent Citizen Services. The robust architecture (Centralized) of the Project enables the Department to extend any type of upgradation with in no time to catch up the latest technology trends in the IT industry. The Department's e-Governance initiative has become the role model to other departments in the own State and brought the attention of many other States in the Country.

The Department has introduced *Cashless* transactions system in the Department on pilot basis from 15-12-2015 for 15 types of Citizen Services. After successful piloting the system the same was rolled-out to all other Citizen Services (44 +15 = 59 Nos.) from 02-08-2016 to achieve the nearness to the Citizen. No physical forms are being accepted in any RTO offices, filled in application forms after applying online and payment is done online/Citizen Service Centres (MeeSeva) shall be submitted in RTO office counters. No fee payments are being allowed in the Department Counters. Department has also integrated with the SMS gateway for sending the transaction details to the Citizen. Citizen can approach to respective RTO office with the SMS received from the Department for the transaction applied. The Department will provide the required statutory application forms if needed by the Citizen. Apart from the sending the SMS to the Citizen for their transactions, Department is also sending the SMS alerts to the Citizen for their transactions like Renewal of Driving License, Payment of Taxes, Renewal of Registration Certificate etc., well in advance so that Citizen can renew their validities.

The fruits of the Project are being enjoyed by all the Stake holders (Transport Department and Citizen). Other State and Central Government departments also benefitted by the Project like Police Department, IRDAI, NIC, Income Tax etc., by exchanging the data in real time for better enforcement. The database of the Department is interoperable with the database of Government of India (National Register) maintained by NIC for the details of all Driving Licences and Registration Certificates issued in the States of India. The data is being regularly updated to National Register on real time basis to maintain the integrity and interoperability of the data with other States.

RESULT INDICATORS

The CFST Project is aimed to address the growing number of Transactions and the same is achieved as there is no much time is taken for disposal of Citizen. The online submission of application is the way to coping with the transaction volume growth. With the introduction of CFST project the time taken to process the transactions has been drastically reduced as the entire database is available with the Department. The data entry of the departmental users has been eliminated, since the applicant is entering all the details online which are being accessed by the Departmental staff with a unique reference number for accessing the information for completion of transaction. All documents like registration certificates and driving Licenses are being issued in a secured and tamper proof output documents in Smart Card form with unique security features as per the standards of Government of India (MoRTH and NIC)

Key Performance

All the 59 G2C services offered by the Transport Department are made online. All these services are now made available to Citizens to submit online mode with a provision for payment of the requite fee and tax in online mode through Net-banking/Credit Card/Debit Card or any Citizen Service Centers (e-Seva/MeeSeva). The Services are:

- New Learner Licence in place of expired Learner Licence
- Learner Licence for addition of a new class of vehicle
- Issue duplicate Learner Licence
- Learner Licence for Expired Driving Licence
- Retest for Learner Licence
- Renewal of License
- Duplicate License
- International Driving Permit
- Badge
- Change of Address
- Surrender of License
- Retest for Driving Licence
- Driving Licence test for Expired Driving Licence
- Driving Licence History Sheet
- Issue of Fresh Conductor Licence
- Renewal of Conductor Licence
- Issue of duplicate Conductor Licence
- Change of Address in Conductor Licence
- Issue of Fresh Authorisation of Dealer

- Renewal of Authorisation of Dealer
- Variation of Authorization of Dealer
- Hire Purchase Agreement
- Hire Purchase Termination
- Transfer of Ownership
- Duplicate RC
- Renewal of RC
- Change of Address
- Alteration of Vehicle
- Issue of NOC/CC
- Cancellation of NOC/CC
- Collection of Fee for correction in Temporary Registration
- Issue of new Trade Certificate
- Issue of duplicate Trade Certificate
- Renewal of Trade Certificate
- Fresh Registration of Vehicle
- Reassignment of Vehicle
- Issue of Fresh Registration Certificate in the name of Financier
- Issue of B-Register (History sheet of vehicle)

- Issue of New Fitness Certificate
- Renewal of Fitness Certificate
- Issue of duplicate Fitness Certificate
- Permission to get Fitness Certificate at Other Station
- Issue of New Permit
- Renewal of Permit
- Issue of Duplicate Permit
- Variation of Permit
- Replacement of Permit
- Transfer of Permit
- Surrender of Permit
- Renewal of Authorisation for National Permit
- Issue of Duplicate Authorisation for National Permit
- Issue of new Recommendation Letter
- renewal of Recommendation Letter
- Issue of duplicate Recommendation Letter
- Transfer of Recommendation Letter
- Collection of Regular Tax
- Collection Bilateral Tax
- Collection of Green Tax
- Collection on VCRs (Vehicle Check Reports)

Benefits obtained from these services

- More than 5 lakh online transactions were attended during the period of one and half month of launch of Online Services. Citizen satisfaction about the delivery of services with online submission of application and online payment facility has been achieved. Other stakeholders Automobile Dealers and other departments like Police are shared the real time data which shows the success of the project. The objective of the Project is 100% fulfilled as the services to citizens are being delivered without any hindrance / technical hitches.

Table: Module Wise Total Transactions Attended

Sl. No.	Module	Total Transactions		
		2013-2014	2014-2015	2015-2016
1	Registrations	1460895	1589751	1763407
2	Licences	2261320	2331636	2641060
3	Fitness Certificates	508203	408062	419412
4	Permits	416129	337624	463791
5	Taxes	706091	804135	887659
	Total	**5352638**	**5471208**	**6175329**

Implementation coverage

- The department has implemented the CFST project in all the RTO offices across the state of Telangana. In addition to the existing arrangements the citizen has been given the empowered choice by extending the service delivery channels to more than 2000 Citizen utility bill payment centers such as online payment (Netbanking/Debit Card/Credit Card)/e-Seva/MeeSeva spread across the state covering Urban and rural areas. The automobile dealers are empowered to register the vehicles temporarily by connecting the Transport Department portal by paying the requisite fee and motor vehicle taxes online.

- Initially Transport Department was delivering the all types of Citizen Services through Departmental Counters by accepting manual application forms except issue of Learner Licenses, Driving Licenses and Registration of new motor vehicles which were made online. From 15-12-2015 provision is made to submit the application online with online payment mode by scheduling their date and time for 15 types of transactions on pilot basis across the State.
- After successful pilot implementation, all other transactions of the department have made online with online payment facility with slot booking across the State from 02-08-2016.

Outcomes in terms of Efficiency, Improvements and integration
- Service transactions are made online and payment of fee and tax, citizen feels comfortable because of the transparent nature of the transaction and quick disposal.
- The time taken for disposal of Citizen has reduced drastically by introducing online system. Citizen will schedule their convenient date and time for the transaction, which resulted in saving the time of Citizen.

Specific innovative ideas implemented in e-Gov area and their impact on services.
- Transport Department implemented AOS (Automated Online Services) for all types of Citizen Services with a provision to make payments through online banking / citizen service centres across the State. This initiative has brought lot of relief to the Citizens as to schedule their date and time for the transaction at their convenience to avoid standing in big queues. The initiative also provide online submission of application.
- The department has also developed a Mobile App. **"RTA M-Wallet"** for storing the vehicle related documents and Driving License in mobile in digital form. Citizen can show their documents in Mobile during the checking on the road.

The extent of integration of this e-Governance initiative
- Transport Department of Telangana integrated its database with Police Department, Insurance Information Bureau of India (IIBI) on real-time basis through web services. Police Department is using the information for issuing of e-challans for the traffic violations for better enforcement. IIBI is the agency of IRDAI which is having the complete database of all motor vehicle insurance companies and sharing the vehicle insurance particulars to the Transport Department as and when insurance certificate is issued for the motor vehicles.

ENABLER INDICATORS
Process reengineering
- Major ICT process change was planned is online submission of application with online payment facility was achieved 100%, with regard to Non-ICT process is dispensing with manual filling of application forms is achieved with these online services, Citizen need not fill any manual application

form, the department is generating all required statutory forms in respect of the transaction. An SMS is also sending to the registered mobile of Citizen indicating the transaction number for further reference to complete their transaction.

Challenges faced in implementing Process changes
- The department not faced much challenges in implementation of online services, as the transactions were already being attended by the departmental staff in ICT environment. Only the change done is submission of application by the Citizen online with online payment of fee and tax. No cash payments allowed in office counters.

The Lessons learnt from the Process re-engineering exercise
- After introduction of the Project, the Department is able to dispose the Citizen with utmost satisfaction in quick and transparent manner. Scheduling of date and time has become easy to the Departmental staff to attend the citizen in comfortable way. The initiative has become nearness to the Citizen.

Best practices adopted from the industry/ other State implementations
- The Department observed the best practices in other states and countries in the industry and implemented the project. The initiative has also brought the attention of many other states have visited the State and studied the initiative of the Department.

Leadership, Change Management, Capacity Building
Leadership support for the initiative
- The initiative has got complete support from the leadership from the Government. Hon'ble Minister for IT and Hon'ble Minister for Transport, Government of Telangana has supported Transport Commissioner to take up the Project. The officers and staff of the Department have welcomed the initiative to serve the Citizen in better way to improve the department image.

Change management and Capacity building strategy
- Before starting the initiative the department has consulted the senior officers, ministerial staff, and executive staff of the department and taken the feedback for better implementation. Employees Associations has also taken into consideration.
- After consultation, arranged massive training classes to all levels of officers and staff of the department to understand the process change and to attend the day to day transactions of the Citizens.

Project management & Monitoring
Transport Department has entrusted the work of Project Maintenance to the Private Partner identified through tender process on quarterly payment basis. The department is managing and monitoring the Services of the Services Provider.

Financial model adopted

- The Department is authorized by the Government to collect User Charges from the Citizens for rendering value added ICT services. The maintenance of the Project is being done by the Service Provider identified through a transparent tender process (e-procurement) by the Telangana Technology Services Ltd., (TSTSL) which is a nodal agency of the Government of Telangana. The Payment of maintenance charges are being paid quarterly by the department after satisfactory services of the Vendor from the User Charges collected.
- Apart from the maintenance charges, the department is utilizing he User Charges for the development of IT infrastructure of the Department in the State.

Special efforts to ensure sustainability of the e-Governance initiative(s)

- Sustainability of the e-Governance Project of the Government Department is the big challenge. The Project of the Transport Department is sustaining for the last one decade for the best support from the Government and other stakeholders. The Government has issued orders to collect the User charges from the Citizen for the value added services and the amount received is being spent for the improvements and project maintenance.

Challenges faced in transition

- The department has arranged intensive training classes to all levels of officers and staff of the department to attend the transactions and quick disposal of the Citizen.

The Lessons learnt from Change Management and Capacity building

After introduction of the Project, the Department is confident enough that any Change in the process can be attempted and successfully implement the same. The departmental officers and staff are also trained in such way that any change in the process can be attended with full confidence.

Technology

Technological solution adopted

- Centralized Architecture with MS-SQL Server 2012 database as backend and C# .NET as frontend. All the offices are connected to the Head Office (Transport Commissioner's office) through TSSWAN using BSNL Leased Lines as a network backbone.
- The project is being maintained by the identified Service Provider through a transparent tender process. The maintenance includes hardware, software and other IT infrastructure like UPS, Generators, Networking equipment etc. The cost of the maintenance is being paid to Service Provider on quarterly basis from the User Charges collected from the Citizen for the value added ICT services apart from the Statutory Fee. This bring the Department to maintain the project with uninterrupted services to the Citizen.

Compliance of the Technology adopted with e-Government standards
- All the Technologies adopted by the Department are as per the industry Standards with Licenses in place. The database is being maintained with utmost security and confidentiality.

Strategy for Disaster Recovery and service continuity
- At present there is no Disaster Recovery Site for the Department. But backups are being maintained regularly in magnetic tapes and also system to system backups are available for service continuity. Separate backup Server is also available for Disaster Recovery and Service Continuity. However, Steps are being taken to have Disaster Recovery and Service Continuity very soon.

Impact and value-addition thru adaption of Social media
- The department is having the account of Facebook to interact with Citizens and receive suggestions. Apart from this an exclusive online and toll free call centre to receive the suggestions and grievance system to improve the service delivery.

Technology related challenges
- The technology related challenge for project was integration of payment gateway to receive the online payments from the Citizen. The department has consulted e-Seva / MeeSeva which is having Citizen Service Centers (CSCs) and also a payment gateway for online payments. The department integrated the payment gateway of e-Seva for the online payments of department transactions.

The Lessons learnt from Technology choices and implementation strategy
- The department is planning to have the payment gateway for online payments by integrating with cyber treasury for direct debit of revenue to the Government exchequer.

VALUE INDICATORS
Digital Inclusion
- Transport Department of Telangana has taken up the steps to file all applications of the Citizens only through online with a facility to pay the requisite fee and tax online mode only. No cash transactions are allowed in RTO office counters. The applications are to be submitted by the Citizen through Online by scheduling their convenient date and time.
- SMS gateway of the Department has been integrated for the online application submission. As soon as the application is submitted by the Citizen an SMS is sent to his registered mobile with a unique application number. Citizens can just walk-in to the respective RTA office with the SMS and get the service done. All statutory forms required for the transaction is being printed and issued to the Citizen at the Departmental Counters. No needs to fill any manual application forms by the Citizen, all

forms are printed in the counter with filled in details of the particular transaction.

Green e-Governance

- The department has taken up the Green e-Government in respect of disposal of ICT gadgets, in such way that while replacing the old hardware, new hardware is being procured on buy back model from the supplier. With regard to environment friendly services, an SMS gateway is introduced to send the information of the application submitted by the Citizen with the reference number. Citizen will have to walk into offices and show the SMS received to get the work done. An SMS alters are also being sent to Citizen for renewal of Licenses, Tax dues and other Transport Department related transaction in place of printed notices.

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e-Project Appraisal and Continuing Enhancements (e-PACE)
National Highways and Infrastructure Development Corporation Ltd.

Sanjay Jaju and Mansoorul Haque

PROJECT OVERVIEW

ePACE (Projects Appraisal and Continuing Enhancements) is an online integrated Management Information System (MIS) portal designed to monitor and improve the progress of development works, at the click of a button. It is a unique initiative that brings projects executed by MoRTH, NHAI and NHIDCL on a common platform, and provides instantaneous static and dynamic information for all these projects, thus ensuring their effective and real time tracking. The information captured spans the lifecycle of these projects, starting from the nascent stages till their end. This Project, by means of various algorithms, acts as a Decision Support system for the top management by helping them identify the projects that are lagging behind and by also helping them mitigate the factors responsible for such lags. In essence, ePACE captures information from multiple levels and stages of project execution, and then collates it on a desirable single platform, ready for use by the top management for effective project monitoring.

Highways in India constitute the second largest road network in the world, carrying 40% of the national traffic on a daily basis. Adding to this massive network, this sector has seen rapid growth in the last two years with the introduction of a large spectrum of initiatives driven by the latest advancements in infrastructure and technology under the aegis of the Ministry of Road Transport and Highways (MoRTH), Government of India (GOI). A record Rs 5 lakh crore worth total investments have been allocated towards road projects, 10,000 km of new highways have been built and over 18,000 km of new road works worth Rs. 2,00,000 crore have been awarded. MoRTH has been adding 20km to highways in India everyday with an aim of taking road construction up to 41km daily.

As a result of the extensive growth and paramount importance being given to the Highways sector, multiple projects of various scales are running in the country simultaneously. Multiple initiatives have brought in a multitude of stakeholders and a huge amount of information on road development and project reports being generated on a daily basis. With the Government of India envisaging the development of world class roads and highways as a crucial area of focus, the need of the hour is to keep pace with the multiple ongoing initiatives and integrate this multiplicity into an efficient and accurate system of data recording which brings together all project related information onto a single platform.

The first learning from this project is that the use of Information Technology Tools for collecting, collating, and analyzing data to produce meaningful information provides the most cost effective method for doing so. By using Information Technology, one is able to centralize the data but still allowing acquisition of the data at a myriad of decentralized levels seamlessly. This helps in reducing the transmission losses and prevents the data from getting impure. It is also possible to prevent wrongful entries, which may have a cascading effect while generating reports.

Another key learning from the project is the fact that while the development of a platform and an IT system is an easy job, making various stake holders take note of it, and adapt it in daily operations is a challenging task. One has to overcome the innate resistance to change especially from those who have stakes in keeping the information obscure in the fear of being caught on the wrong foot. The resistance to such change can be handled by using the 'carrot and stick' approach, something that was duly exercised by the Ministry in this regard. Regular meetings and reviews with the stakeholders helped in breaking the resistance, and bringing them on board.

ePACE also illustrates that while creating such systems, it is essential that there is clarity on who has to provide which set of data and who all should be given the access rights. Additionally, projects of this nature have to evolve over a period of time and would therefore have to be sustainable as well as scalable. ePACE in its current form and functionalities is far different, and far more evolved from what it was at the drawing board stage. Last but not the least, is the need for the system to be user-friendly, uncomplicated, and easily adaptable for its various intended users considering the levels of their capacity and preparedness. The successful implementation of such projects also depends a lot on constant capacity building exercises to mitigate such problems.

RESULT INDICATORS

The MoRTH undertakes large number of projects through its various executive agencies including NHAI, NHIDCL and State PWDs. Projects like Bharat Mala, connecting places of religious significance, port connectivity, making the North East more accessible, building thousands of new railway bridges and underpasses, enhancing road safety, efficiency and comfort, building people friendly initiatives, have all started on ground simultaneously. These are big-ticket projects involving huge capital outlays with construction durations ranging from months to years and located across diverse stretches all over the country. Due to the involvement of multiple agencies, the monitoring of these projects is always an uphill task. At times discrepancies in physical and financial progress are noticed much after the occurrence of the damage thereby being of no use. With ePACE and the real time tracking of project progress that it brings to the table, problems can be detected at the time of occurrence, so that swift action can be taken ensuring minimal damage to the project itself.

It was also observed that some of the departments and agencies either had no monitoring system or a system that was not designed to maintain any sanctity with regard to the data collection, collation, and conversion in to any meaningful information. Every event would trigger new requirement for acquisition of data since the information was either unavailable in one place, or available in various heterogeneous formats. Because of the involvement of large capital outlays and lack of centralized monitoring systems, the physical progress of the projects suffered, leading to huge cost and time overruns. This led to inefficient and ineffective utilization of resources at all levels. ePACE removes such impediments since it provides a single point source of all relevant information, which is collated into useful tabular and graphical formats, thereby saving time and effort of fresh

data collection and analysis. The rights for manipulation of data of various levels are restricted to their respective level of users, which ensures only the appropriate authorized personnel have the facility to alter critical project data.

It goes without saying that the need of the hour was to INTEGRATE MULTIPLICITY by designing a platform of platforms, a dashboard of dashboards, to be truly able to access information of a scale and magnitude that is unprecedented, and that too all in real time. ePACE thus became a solution, the answer, a SINGLE POINT Real Time Coordination, Monitoring and Information Management System for Highways India that is scalable, customizable and easily accessible to a cross section of stakeholders. It has transformed prosaic monitoring tools into a dashboard model and a platform that now ensures quick links to the projects undertaken by MoRTH, NHAI, NHIDCL. A platform that is now amenable to be connected to social media like Facebook, Twitter, Bing etc and ultimately to the public at large.

Key Performance
Service is of G2C
ePACE captures the static and dynamic information for all the projects executed by MORTH, NHAI, and NHIDCL. The information captured spans across the lifecycle of the project starting from inception till its completion. The system has role based user access, and facilitates real time capturing of project information and helps in monitoring and accelerating the pace of the projects ensuring lesser delays and greater transparency. The project has so far captured information for 2000 projects worth Rs 4 Lakh crores. As the entire portal has been developed in house, the cost of developing the portal is a meager Rs 40 Lakhs. The return on investment is in multiple digits.

Since the data entry into this system requires little to no time, the data updating process is sped up manifold. Further, since the data updating work is to be done by respective authorized personnel, and requires as little time, no significant addition to man-hours is made, thereby restricting the operational costs. On the other end of the spectrum however, removing the duplicity of effort by providing a centralized information resource pool i.e. ePACE, saves several hundreds and thousands of man-hours.

Year-wise wise transaction volumes for various services: It is a MIS based portal hence no such transaction thing happening on this portal.

Implementation coverage
This project has been designed to provide critical information related to various National Highway projects to the top management in varied customized formats. The top management thereby has access to accurate information pertaining to the status of each project. This facilitates identification of projects that are lagging behind, and the reasons for their slow progress so that requisite steps are taken to mitigate lags thereby accelerating the pace of such projects.

The elected public representatives are also among the target group. The portal provides all the project relevant information including their current status and the nature of development to the representatives in one place with a click of a button, saving the time and effort of visiting or contacting individual offices. This helps them provide their constituents more accurate information and much faster. It also aids them in better planning of new projects in their constituencies. The portal also aims to serve the general populace by providing open access to information regarding various road projects and their respective progress, thereby bringing the required transparency, and accountability to the process of project execution. Essentially the portal is built to cater to the entire gamut of stakeholders related to the projects being executed for the development of National Highways by MoRTH, and GOI.

Outcomes in terms of Efficiency, Improvements and integration
ePACE captures the static and dynamic information for all the projects executed by MORTH, NHAI, and NHIDCL. The information captured spans across the lifecycle of the project starting from inception till its completion. The system has role based user access, and facilitates real time capturing of project information and helps in monitoring and accelerating the pace of the projects ensuring lesser delays and greater transparency. The project has so far captured information for 2000 projects worth Rs 4 Lakh crores. As the entire portal has been developed in house, the cost of developing the portal is a meager Rs 40 Lakhs. The return on investment is in multiple digits.

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Specific innovative ideas implemented in e-Gov area and their impact on services
ePACE has been designed to go beyond "Traditional Project Management" tools. It is a web-based system, which allows role-based access to its users. Such users are internal stakeholders whose roles have been laid out through a "Data Capture Hierarchy". This Data Capture Hierarchy allows entry of project static information at the top level while the project execution details are entered at the bottom level. At the highest level, the moment a particular project is sanctioned, the relevant data is captured. The static data entry relates to capture of basic, technical, financial, and approval details of that particular project. Once this information is entered, the system generates a sanction letter thereby helping in automating the business workflow. Depending upon whether the work is in pre-project stage or post-project stage, the salient information pertaining to the bid process is also captured. The capture of the bid process is also so designed that it transcends all stages of bid stage management starting from the issuance of tender notice to the evaluation of technical and financial bids, and ultimately leading to the issuance of the letter of award. The system also provides for automated generation of the letter of award

once the entire information related to the tender is entered. After the project reaches the contract stage, the salient quantifiable information pertaining to the contract is entered. In order to accurately estimate the physical progress of the project, all work components of the projects/items are entered at this stage. This is done so that it becomes a benchmark for estimating the physical progress of the work. The static entry (one time entry) is done at the highest level and the same then remains frozen during the life cycle of the project, unless and until revised. In order to ensure sanctity of the data, only the top management enters the static data. The remaining information is captured at the field level. This information is in the form of entry of physical and, financial execution details among others. The portal also facilitates upload of images and videos pertaining to the project progress.

A plethora of algorithms have been embedded into the system by means of which the aforementioned data is processed to obtain reports in various desired formats. Such reports not only track the award of works during a particular period, but also bring out the completed lengths during that period. The exact physical progress is also obtainable and available in various reports. The portal provides a Dashboard view for every project, and an integrated Dashboard for various programmes, schemes, states and agencies within the MoRTH. The portal has GIS/Google Maps integration by means of which individual projects can be located on the country map using exact location markers. This has been designed to provide a tool for proper planning of road projects and filling in gaps, wherever necessary. A search engine has also been created with multiple fields of queries to get reports in various customized formats as required by the various stakeholders.

The extent of integration of this e-Governance initiative with other internal and/or external ICT systems
This initiatives integrates with all the conventional e-initiatives and secures entire data in itself. It is of comprehensive and exhaustive nature which includes all the data pertaining to every national highways projects being implemented throughout the country.

ENABLER INDICATORS
Process reengineering
A web based portal was developed to ensure transparency and accountability in such a manner that citizens were to be a major part of this MIS portal.

Challenges faced in implementing Process changes
Highways in India constitute the second largest road network in the world, carrying 40% of the national traffic on a daily basis. Adding to this massive network, this sector has seen rapid growth in the last two years with the introduction of a large spectrum of initiatives driven by the latest advancements in infrastructure and technology under the aegis of the Ministry of Road Transport and Highways (MoRTH), Government of India (GOI). A record Rs 5 lakh crore worth total investments have been allocated towards road projects, 10,000 km of new highways have been built and over 18,000 km of new road works worth Rs. 2,00,000 Crore have been awarded. MoRTH has been adding 20km to highways in India everyday with an aim of taking road construction up to 41km daily.

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The model in place, prior to the introduction of ePACE, involved the collection of detailed information on road construction works through multiple existing monitoring systems and posed a major challenge. This was fundamentally due to the large number of capital works being carried out through multiple agencies. With no single platform for accumulating and integrating data, every project report required fresh acquisition of data, which was a tedious and repetitive process for all involved. The lack of a centralized repository for projects related documentation led to the inability to track projects throughout their life cycle, thereby leading to inaccurate measurement of physical & financial progress. The information gap thus created crippled the system with recurrent delays and inefficient deployment of resources. Most importantly, there was no information available regarding these projects in the public domain.

MoRTH's vision of using Information Technology to usher in a revolution in the Highways sector thus aligned with the need to create a unique efficiency enhancer and information dispenser for Indian Highways. The panacea to this predicament came in the form of single point real time coordination, monitoring and information management system for Indian highways that is scalable, customizable and easily accessible to the large spectrum of stakeholders. This system would ensure transparency and provide information in public domain in a dynamic manner, thus aiding in monitoring and expediting the pace of the projects.

The Lessons learnt from the Process re-engineering exercise
The first learning from this project is that the use of Information Technology Tools for collecting, collating, and analyzing data to produce meaningful information provides the most cost effective method for doing so. By using Information Technology, one is able to centralize the data but still allowing acquisition of the data at a myriad of decentralized levels seamlessly. This helps in reducing the transmission losses and prevents the data from getting impure. It is also possible to prevent wrongful entries, which may have a cascading effect while generating reports.

Another key learning from the project is the fact that while the development of a platform and an IT system is an easy job, making various stake holders take note of it, and adapt it in daily operations is a challenging task. One has to overcome the innate resistance to change especially from those who have stakes in keeping the information obscure in the fear of being caught on the wrong foot. The resistance

to such change can be handled by using the 'carrot and stick' approach, something that was duly exercised by the Ministry in this regard. Regular meetings and reviews with the stakeholders helped in breaking the resistance, and bringing them on board.

ePACE also illustrates that while creating such systems, it is essential that there is clarity on who has to provide which set of data and who all should be given the access rights. Additionally, projects of this nature have to evolve over a period of time and would therefore have to be sustainable as well as scalable. ePACE in its current form and functionalities is far different, and far more evolved from what it was at the drawing board stage. Last but not the least, is the need for the system to be user-friendly, uncomplicated, and easily adaptable for its various intended users considering the levels of their capacity and preparedness. The successful implementation of such projects also depends a lot on constant capacity building exercises to mitigate such problems

Best practices adopted
This web portal is totally free to be accessed in public domain and hence it guarantees full degree of transparency.

Change management and Capacity building
We have created a team of e-PACE, where we are handling the maintenance part of it and we take customers feedback on daily basis. We also help them to sort their problems at our best and provide the resolutions related to their problems and satisfy them.

Financial model adopted
Financial model and layout work were done in-house, it cost a mere 25 lakh rupees.

Special efforts to ensure sustainability of the e-Governance initiative
Bringing in transparency in the monitoring of all aspects of highway projects. Margin for human error has been greatly reduced. The associated cost of human error has therefore also reduced. In this web portal, maintenance cost is very low while saving unexpected human error costs to a great extent. All these factors combined with taking customer feedback, make the web portal very cost effective.

Challenges faced in transition
Highways in India constitute the second largest road network in the world, carrying 40% of the national traffic on a daily basis. Adding to this massive network, this sector has seen rapid growth in the last two years with the introduction of a large spectrum of initiatives driven by the latest advancements in infrastructure and technology under the aegis of the Ministry of Road Transport and Highways (MoRTH), Government of India (GOI). A record Rs 5 lakh crore worth total investments have been allocated towards road projects, 10,000 km of new highways have been built and over 18,000 km of new road works worth Rs. 2,00,000 Crore have been awarded. MoRTH has been adding 20km to highways in India everyday with an aim of taking road construction up to 41km daily.

As a result of the extensive growth and paramount importance being given to the Highways sector, multiple projects of various scales are running in the country simultaneously. Multiple initiatives have brought in a multitude of stakeholders and a huge amount of information on road development and project reports being generated on a daily basis. With the Government of India envisaging the development of world class roads and highways as a crucial area of focus, the need of the hour is to keep pace with the multiple ongoing initiatives and integrate this multiplicity into an efficient and accurate system of data recording which brings together all project related information onto a single platform.

The Lessons learnt from Change Management and Capacity building
All the projects were not under a common umbrella till this portal was developed. Lack of transparency in all other conventional system of project monitoring. Cost effectiveness was one of the aspect.

Technology
Technological solution adopted: Technology used - .Dotnet.

Compliance of the Technology: It is compliance with the e- Governance technology.

Strategy for Disaster: As per NIC data recovery and service continuity.

Impact and value-addition thru adaption of Social media: Publicity is being done on social media platforms to make more people aware of it.

Technology related challenges: Before e-PACE was launched, all the projects were not under a common umbrella and hence were not able to be monitor on a common platform.

The Lessons learnt from Technology choices and implementation strategy
With development of e-PACE, all the drawbacks with the existing conventional system of monitoring were eradicated completely making it a very efficient and user friendly interface for project monitoring.

VALUE INDICATORS
At a time, when various stakeholders in real time seek information, transparency and universal access actively, e-Pace provides a viable solution to take the Prime Minister's vision to harness Information Technology forward and usher in a revolution in the Highways sector.

ePACE is a vibrant and versatile web based medium for collection and dissemination of information to ensure effective and real time tracking of infrastructure projects. It strives to make a positive contribution towards the timely and successful completion and running of projects. The portal envisages to be a compendium of all project related data starting from basic project data, setting of targets covering the entire life cycle right from project identification, pre-project activities, construction period activities, all the way to the completion of the project.

The data pertaining to physical and financial execution along with project photographs/videos and documents are entered at the field level. This would result in a single source of truth along with validation checks; it would prevent wrongful entries and make fudging figures, well-nigh impossible.

Digital Inclusion
This initiative facilitates stakeholders pertaining to PAN India in a common language of English. Other language options are under concept stage and will be implemented for covering the understanding of stakeholders from all parts of the nation.

Green e-Governance
Due to the launch of e-PACE, paper work has been reduced to a great extent because it allows digital form of monitoring. No disposal of e-waste due to the non usage of new hardware. No need for generating and printing reports all the time on piece of paper.

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INAM-Pro

National Highways and Infrastructure Development Corporation Limited
Ministry of Road Transport and Highways, Government of India

Sanjay Jaju and Mansoorul Haque

Project Overview

INAM-Prois a platform and marketplace for Infrastructure and Material Providers to conduct business in a fair, transparent and swift manner. With this platform, it aims to free the infrastructure sector from external impediments like materials shortages, cost escalations due to material prices etc. that have historically plagued the field of infrastructure development. Bringing the material suppliers and the Contractors/Agencies in the field of infrastructure development to a common platform for improving the ease of conducting business by providing a user friendly web-based platform that reduces uncertainty and confusions. Creating a wider network of sellers and buyers which would be accessible with the click of a button from any location across the globe. To speed up the entire process of project execution by removing unnecessary delays. Alleviating the problems of artificially created material shortages. Bringing in transparency in the pricing of the infrastructure related materials and removing the business cartels from the picture for fairer trade. Encouraging greater competition in the industry for generating greater sales for sellers, as well as better pricing for the buyers. Facilitating swift transactions, and transfer of money and resources between suppliers and buyers.

Overall approach to the project achievements with reference to plan, current status and the deviations from plan may be provided. Specific information with regard to ICT interventions/Initiatives undertaken during the last two years to be presented. The portal is currently operational for Steel and Cement suppliers as well as buyers, along with online payment gateway to facilitate online transactions. Work goes on progressively as we speak towards incorporation of other infrastructure development related materials besides steel and cement. The aim is to create a platform, which sells the A to Z of infrastructure materials online. Addition of Road side furniture, Crash barriers and fixtures sellers on the portal to further aid the field of highway development is the next step. Down the road it is aimed to add heavy machineries suppliers as well. Besides these incorporations, it is also aimed to encourage and eventually shift all financial transactions related to this field on to the digital platform. With this, it is hoped that the dependency on cash will reduce drastically, thereby reducing the chances of black money transactions, tax thefts, besides also moving towards making India a cashless economy. Efforts are also constantly being made to get inputs from the users, and improving the portal based on those inputs so as to make the portal the user-friendliest portal, thereby attracting more users to it.

With INAM-Pro, we have attempted to eradicate this problem of supply uncertainty, which will lead to better planning and accurate scheduling, thereby timely completion of projects, and an overall improved project execution. It automates the process to such a great extent that not only the human effort, but also the margin for human error has been drastically reduced.

RESULT INDICATORS

Table: Impact of INAM - Pro

Sl. No.	Basis	Pre-Deployment Problems	Post-Deployment alleviation due to solution
1	Delays due to artificial stock shortage	Projects would often get delayed on account of stock shortage which may not always be true. This cost the government dearly for the development would get stalled for that duration.	With minimum committed stock per year, as well as the real-time stock status and changes that are in public domain thanks to INAM-Pro, the practice of hoarding and creating an artificial supply shortage has been curbed. Prospective buyers know exactly which company has which product in which stockyard, and in what quantity at what price.
2	Artificially inflated prices	Due to above mentioned artificial stock shortages, prices would escalate for whatever stock was available, as the demand would be high, and supply short. This invariably led to cost escalation for the overall project.	Thanks to the removal of artificial stock shortage practices, the inflated prices have been checked. Additionally, thanks to prices visible openly in the public domain, competition has been induced in to the market which gives sellers an incentive to make their prices as lucrative as possible. Further, owing to the fixed ceiling price factor, prices cannot skyrocket any more.
3	Limited knowledge about prospective buyers in the industry	Earlier knowledge of prospective buyers, and thereby prospective markets for sale of products could only be acquired by means of setting up offices in the regions, or doing market surveys, or simply word of mouth through every seller's private communication or retailer networks. This was a costly and unreliable affair.	The buyers from all across the country are now listed on public domain along with their contact details thereby making this entire process seamless and immensely user friendly. The projects, both ongoing and being awarded are also made available on the portal along with their capital outlays and nature of construction

Sl. No.	Basis	Pre-Deployment Problems	Post-Deployment alleviation due to solution
4	High prices due to middle-men	To sell products in a region required a vast retailer and/or wholesaler network establishment. This directly translated to colossal establishment, maintenance, and service commission costs which reflected in the product price.	Due to online sale/purchase model, the need for these middle-men has been eradicated. The buyers now buy directly from the sellers, thereby enabling the seller to provide material at a much lower cost thus making the purchase more lucrative, faster, and also eventually bringing down the overall project cost.
5	Tax theft and Black money problems	In an industry that worked with cash transactions, the rate of tax theft was high. Retailers would often sell the product at a cheaper rate by not reporting the sale and thereby not paying the requisite tax amount.	The invoicing is all done automatically. Depending on the location of purchase and location of delivery of product, applicable taxes are added directly to the final payable price. Further, due to incorporation of online payment gateway, the push towards a cashless economy has strengthened. Direct account transfers or similar online payments ensure easier traceability of all financial transactions thereby reducing the possibility of tax frauds.
6	Trust in the seller for delivery of product	In the earlier days the sellers would often deliver only partial material and that would lead to buyer seller disputes.	Each seller has been made to commit a Bank Guarantee to ensure smooth and reliable purchase experience.

Key Performance

Service Type- B2B

The creation of the web portal is a one-time effort, and a one-time cost. Since most of the conception and layout work was done in-house, it cost a mere 25 lakh rupees. Due to the deliberately simple and user friendly design, unnecessary complexities in the user interface have been avoided, thereby reducing the cost. The monitoring of the website requires a small team of two to three people at the very most. The man-hour input of the people responsible for monitoring works is at the very most two to three hours in a day.

Outcomes in terms of Efficiency, Improvements and integration

Ceiling Prices to prevent skyrocketing of prices. Committed Quantities to prevent artificial shortages & curtail hoarding practices. Publicly visible real time rates and stocks for ensuring utmost transparency.

Specific innovative ideas implemented

INAM-Pro is aimed at making the road building procedure faster, more transparent and more efficient, and all officials and other stakeholders should make maximum use of the innovations relevant to their areas of operation. The platform was launched in March 2015 to facilitate contractors and cement buyers engaged in executing central/state funded roads and highways and bridge construction projects to place cement orders online with the registered cement companies offering cement at competitive rates in the vicinity of project execution locations.

The extent of integration

Self-financed initiative.

ENABLER INDICATORS

Process reengineering

Major ICT and Non-ICT process changes

We have developed Web portal which is a platform and marketplace for Infrastructure and Material Providers to conduct business in a fair, transparent and swift manner. Prices are low compared to market price. With this platform, it aims to free the infrastructure sector from external impediments like materials shortages, cost escalations due to material prices etc. that have historically plagued the field of infrastructure development and also the prices are gate-way.

Challenges faced in implementing Process changes

Prior to the development of this portal, the lack of a common marketplace led to the formation of a segregated network of buyers, while at the other end of the spectrum the suppliers still remained aggregated. This disparity gave way to cartelization and inflationary pressures on pricing of cement and steel. INAM-Pro provides a common platform wherein buyers are aggregated, and volatility in prices is controlled and maintained within an upper ceiling price. Another huge challenge in this regard was the practice of non-disclosure of prices. These industries have traditionally been very secretive about their prices, and did not prefer disclosing their rates to their competition in fear of losing clientele. This even led to cartel formations, which were disruptive to competition in the industry. Cement and other materials were often given at artificially inflated price due to hoarding practices prevalent in the industry. This led to not only escalated project costs, but also delayed project executions due to the false shortage.

Another problem was the lack of transparency and existence of middlemen in the hierarchy between buyers and suppliers that crippled the system. INAM-Pro has therefore been designed to ensure swift transfer of payments and resources between buyers and suppliers, and to bring in transparency in infrastructure projects by ensuring that all information about source of procurement, price etc. is available in public domain. By providing suppliers with a comprehensive idea about future

demands, and fixing prices for 3 years with a fixed escalation per year, this portal provides the suppliers with a definite assurance of supply and price.

The Lessons learnt from the Process re-engineering

All across the nation, this portal is an unprecedented information compendium, a first of its kind. In the last one year itself since the first time an initial prototype of the website went live, the number of queries regarding the functioning, and response from prospective buyers and sellers has been outstandingly overwhelming. It was also learned that transparency in the working of any industry inspires a lot of confidence in the minds of not only those working within it, but also in the minds of the general tax payer. This is evident from the fact that an approximate average 200 MT of cements is purchased through the portal on a daily basis despite the web portal being so young.

Best practices adopted

For the Cement portal, the target population of sellers includes all large scale cement manufacturers in the country. For Steel portal, the target population of sellers includes all manufacturers who are among producers manufacturing from either their own mined ores, or from raw materials bought exclusively from standard primary producers in the country.

The target population of buyers comprises the Contractors and agencies who are involved in the Infrastructure Development work projects that are related to Governmental bodies including but not limited to National Highways Authority of India (NHAI), National Highways and Infrastructure Development Corporation of India Ltd. (NHIDCL), Central Public Works Department (CPWD), State Public Work Departments (PWD), Municipal Corporations, Irrigation Departments, Defense organizations, among others.

Leadership, Change Management, Capacity Building during transition

We have conducted several meetings which are high level and finally companies pursued to shift online platform.

Change management and Capacity building

We have created a team of INAM-Pro, where we are handling the maintenance part of it and we take customers feedback on daily basis. We also help them to sort their problems at our best and provide the resolutions related to their problems and satisfy them.

Financial model adopted

Financial model and layout work were done in-house, it cost a mere 25 lakh rupees.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Bringing in transparency in the pricing of the infrastructure related materials and removing the business cartels from the picture for fairer trade. All quantity and cost calculations are automated along with the applicable tax components. The invoice is also generated online. Margin for human error has been greatly reduced. The associated cost of human error has therefore also reduced. In this web portal,

maintenance cost is very low while saving unexpected human error costs to a great extent. All these factors combined with taking customer feedback, make the web portal very cost effective.

Challenges faced in transition

- Firstly, the lack of a common marketplace led to the formation of a segregated network of buyers.
- The practice of non-disclosure of prices.
- Existence of middlemen in the hierarchy between buyers and suppliers that crippled the system.
- Cement and other materials were often given at artificially inflated price due to hoarding practices prevalent in the industry.
- Transfer of payments and resources between buyers and suppliers, and to bring in transparency in infrastructure projects by ensuring that all information about source of procurement, price etc is available in public domain.
- By fixing prices for 3 years with a fixed escalation per year, this portal provides the suppliers with a definite assurance of supply and price.

The Lessons learnt from Change Management and Capacity building

Lack of certainty in turn led to improper planning and inaccurate scheduling of works, thereby causing inevitable delays. These delays further increased the cost of the works as by the time the next stage would arrive, the rates for all materials, machines, labour components would have escalated.

Technology

Technological solution adopted: .Dotnet.

Compliance of the Technology adopted

It is compliance with the e- Governance technology.

Strategy for Disaster Recovery

As per NIC data recovery and service continuity.

Impact and value-addition thru adaption of Social media

Publicity is being done on social media platforms to make more people aware of it.

Technology related challenges

Before INAM-Pro was launched, there were delays due to artificial stock shortage but now with the introduction of INAM-Pro, the practice of hoarding and creating artificial supply shortage has been curbed. Before the demand was high and the supply was short due to artificially inflated prices, but now due readily visible prices, the inflation of the prices has reduced so far.

The Lessons learnt from Technology choices and implementation strategy

With INAM-Pro, we have attempted to eradicate this problem of supply uncertainty, which will lead to better planning and accurate scheduling, thereby timely completion of projects, and an overall improved project execution. The

creation of the web portal is a one-time effort, and a one-time cost. Since most of the conception and layout work was done in-house, it cost a mere 25 lakh rupees. Due to the deliberately simple and user friendly design, unnecessary complexities in the user interface have been avoided, thereby reducing the cost. The monitoring of the website requires a small team of two to three people at the very most. The man-hour input of the people responsible for monitoring works is at the very most two to three hours in a day. Support queries are handled through telephone and emails thus savings costs there as well.

VALUE INDICATORS
The web portal of INAM-Pro would facilitate contractors/cement buyers engaged in executing the Central/State funded Roads and Highways/Bridge construction projects to place cement orders online with the registered cement companies offering cement at competitive rates in the vicinity of project execution locations.

Bringing in transparency in the pricing of the infrastructure related materials and removing the business cartels from the picture for fairer trade. Encouraging greater competition in the industry for generating greater sales for sellers, as well as better pricing for the buyers. Facilitating swift transactions, and transfer of money and resources between suppliers and buyers.

Digital Inclusion
Facilitate cement buyers engaged in executing construction of roads, highways and bridge to order cement online with the registered cement companies at competitive rates. It will help the Ministry to track and monitor the activities of buyers and suppliers, and remove impediments of both the parties. It will help the Ministry to track and monitor the activities of buyers and suppliers, and remove impediments of both the parties.

Green e-Governance
Due to the launch of INAM-Pro, paper work has been reduced to a great extent because it allows digital invoicing. No disposal of e-waste due to the non usage of new hardware. No need for quotations because all prices are readily visible.

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INFRACON

National Highways & Infrastructure Development Corporation Limited
Ministry of Road Transport and Highways, Government of India

Sanjay Jaju and Mansoorul Haque

PROJECT OVERVIEW

INFRACON is a web based National Portal for Consultants and Consultancy Firms working for the Infrastructure sector, particularly for the Roads and Highways. These consultants are engaged by the public bodies in the preparation of detailed project reports and also in supervision of the under construction projects. INFRACON has been designed to allow Consultancy Firms and Key Personnel to upload their credentials online and in the manner and form which enables automatic evaluation of their technical proposals. The Portal has the facility to host Firms & Personnel CVs and Credentials online with linkage to Aadhar & Digi-locker for data validation & purity. The Portal also facilitates the public agencies to receive technical proposals through INFRACON. In order to do so, firms & key personnel are required to register on the portal online. This has been done to significantly reduce the paper work being done during bid submission and also to bring in Transparency & Accountability in the process. The information being captured on the portal and the input forms are so designed that it also aids in automating the evaluation process and leads to quick and effective decision-making. Highways in India constitute the second largest road network in the world, carrying 40% of the national traffic on a daily basis. Adding to this massive network, this sector has seen rapid growth in the last two years with the introduction of a large spectrum of initiatives driven by the latest advancements in infrastructure and technology under the aegis of the Ministry of Road Transport and Highways (MoRTH), Government of India (GOI). A record Rs 5 lakh crore worth total investments have been allocated towards road projects, 10,000 km of new highways have been built and over 18,000 km of new road works worth Rs. 2,00,000 Crore have been awarded. MoRTH has been adding 20km to highways in India everyday with an aim of taking road construction up to 41km daily.

As a result of the extensive growth and paramount importance being given to the Highways sector, multiple projects of various scales are running in the country simultaneously. With the Government of India envisaging the development of world class roads and highways as a crucial area of focus, the need of the hour is to keep a Common Platform for both the Service Providers and Clients. It would also open a window for professionals engaged in the Infrastructure domain to showcase their experiences and contribute to Nation Building. Work goes on progressively as we speak towards incorporation of other infrastructure development related projects besides DPR. Efforts are also constantly being made to get inputs from the users, and improving the portal based on those inputs so as to make the portal the user-friendliest portal, thereby attracting more users to it. There is limited availability of good quality skilled resources in the country. There is no place where one can find all the professionals needed for infrastructure projects at one place. Now with the advent of INFRACON, more than 3700 consultants and over 600 consultancy firms have registered so far. More than 350 projects have also been bidded out through this portal and these numbers are growing by the day. In fact, NHIDCL has completed automatic evaluation of projects through the portal itself and it expects

that over a period of time this would become a comprehensive National Database for individuals Consultants and Firms. In short, this project caters to a wide array of organizations and individuals, namely state agencies bidding out consultancy projects, and consultancy firms and individual consultants applying for such projects. At the same time, concessionaires and contractors may also make use of the portal to identify suitable personnel for their projects. The core objective of this portal is to improve the quality of project reports and supervision of public infrastructure projects, it's therefore no exaggeration to say that the ultimate beneficiary of this project would have to be the citizens grappling with poor quality infrastructure in our country.

A detailed and good quality project report lies at the heart of any good project. After the projects are bided out and awarded to various contractors/ concessionaires, key professionals hired from the market also assist in the supervision of these projects. This entire activity is outsourced to external consultancy firms and consultants. These consultants are primarily Highway Engineers, Bridge Engineers, Safety Engineers and Quantity Surveyor etc. Their selection is done on a qualitative basis in which 80 percent weight age is given to technical expertise and 20 percent to financial capability. Technical aspects that include qualifications and number of years and kind of experience are very subjective and is broadly based on individual or firm's curriculum vitae. Numerous incidents had come to the notice of authorities in regard to project specific tailoring of the CVs by the Consulting Firms and the Key Professionals. There was no way to find out misdeeds such as a professional presenting himself to be a highway engineer today for a particular project, would try to get himself considered as a tunnel expert the next day for another project, and become a different specialist some other day or year. All this was camouflaged in sheaths of papers submitted as bio-data during the bid submission. The whole business of consultancies got pocketed by such companies and personnel who had more skills in engineering the resumes rather than the engineering skills. This was compounded by their inner knowledge of the rules of the game leading them to tailor such CVs accordingly. As all these bids are awarded on QCBS mode of selection where technical marks play a huge role, the dressed up CVs and credentials led to faulty evaluation and incorrect selection of the Consultants. In short, such a loophole was exploited by unscrupulous elements on both sides, in the knowledge that evaluation process would take a lot of time and mistakes would be difficult to detect. In a scenario like this, the process can't be but subjective.

Another key learning of the project is the fact that while development of a platform and an IT system is always an easy job in the current age of huge technological advancements, making various stakeholders take note of it and become ready to use and upload data is a more challenging task. One has to overcome the incipient resistance to change especially from those who have stakes in keeping the information obscure in the fear of being caught on the wrong foot. The resistance to such change can be handled by using the 'carrot and stick' approach, something that was duly exercised by the Ministry in this regard. Regular meetings and reviews with the stakeholders help in breaking the resistance and bring them on board. The fact, that it was made mandatory for all the agencies in MoRTH to use the portal for

bidding out various projects, made adoption and adaptation faster and easier. Looking at the success of INFRACON, it's imperative that a similar system is developed for Contractors and Concessionaires. This would make their technical evaluation easier, faster and transparent.

RESULT INDICATORS

The MoRTH undertakes large number of projects through its various executive agencies including NHAI, NHIDCL and State PWDs. Projects like Bharat Mala, connecting places of religious significance, port connectivity, making the North East more accessible, building thousands of new railway bridges and underpasses, enhancing road safety, efficiency and comfort, building people friendly initiatives, have all started on ground simultaneously. These are big-ticket projects involving huge capital outlays with construction durations ranging from months to years and located across diverse stretches all over the country. There was therefore, need to bring in transparency and accountability to the bidding and evaluation process, which necessitated the use of Information Technology to bring about a cost effective and easy to use solution to such problems. Against this backdrop, Ministry of Road Transport & Highways asked National Highways & Infrastructure Development Corporation Limited (NHIDCL) to create an IT Platform, which could act as a comprehensive National Portal for Infrastructure Consultancy Firms and Key Personnel.

With this project, therefore, the intention was to bring transparency and enhance accountability in the process of selection of consultants in the roads and highways sector. Ultimate objective is to have an unerring selection of consultants leading to better quality project reports and timely execution of project works, thereby saving large amounts of public money and time. As is evident, a manual, subjective, unaccountable process has been turned on its head to give way to an online, objective and accountable system. It has also opened a window of opportunity for all those who want to work for the sector but are not able to get the desired opportunity due to lack of awareness about the projects and the consulting firms that might be soliciting their services. The consultants disparately located anywhere in the country now just have to go online, put out their CV on INFRACON and there is a good chance that somebody will pick that CV up and hire them.

On the other hand, INFRACON has made the task simpler, faster and transparent for the clients as well. Otherwise, it used to take months for evaluating the technical proposals with the element of subjectivity and scope for error being the order of the day.

Key Performance
Service Type - G2B type
The consultancy firms were required to submit detailed Bio-Data/ Resume, which led to voluminous paper work during bid submission. They had to prepare this material for every submission. All this cost obviously got loaded in the proposals to be footed by the state. The same also resulted in herculean effort at the client end to evaluate such CVs and award technical marks. A visit to any of the client's office would present a picture of space occupied by technical documents, essential to be

preserved for years together for the auditor's eyes. All this is the cost saved for the system. With everything digitalized, we benefit on space saved to store documents, time saved to evaluate these documents and bring about transparency in evaluation. The evaluation is now done on just a click of a button.

On the other hand, Infracon should improve the quality of project reports and supervision, which should improve the project execution. The benefit of a successfully executed infrastructure project, though difficult to quantify, is huge. As the entire portal has been developed in house, the cost of the portal is a meager Rs 30 Lakhs. The return on investment is in multiple digits.

No financial transaction happens on this portal; however we have more than 3700 consultants and over 600 consultancy firms registered with us this year. More than 350 projects have also been bidded out through this portal and these numbers are growing by the day.

Implementation coverage
The portal is national and it provides an opportunity for individual specialists and consultancy firm to team-up. So an individual specialist from any parts of the country and a consultancy firm who may not know each other can form a team for bidding the projects. It has also smoothened the tedious job of evaluation that earlier used to take months together. The system has been designed in such a way that ministry is now able to get online evaluation done by a click of a button. The portal hence opens-up a huge window of opportunity for all those who have the required skills, but are not recognized, to get noticed by the system. Somebody may be a civil engineer in Darbhanga district of Bihar, but nobody would know of it. This portal gives an opportunity to that person to put his information in public domain and get noticed.

New services that were added include Key Personnel replacement, where in a team member of the firm who had been awarded the contract can be replaced online on INFRACON. SMS and e-mail notification for any new tender to all the registered firms free of cost. Option to see evaluated results and their drill down has also been recently operationalised.

Description of the new services
INFRACON is now developing a similar system for Authority Engineer, Contractors and Concessionaires.

Outcomes in terms of Efficiency, Improvements and integration
Description of Time and cost efficiency improvements
The consultancy firms were required to submit detailed Bio-Data/ Resume, which led to voluminous paper work during bid submission. They had to prepare this material for every submission. All this cost obviously got loaded in the proposals to be footed by the state. The same also resulted in herculean effort at the client end to evaluate such CVs and award technical marks. A visit to any of the client's office would present a picture of space occupied by technical documents, essential to be preserved for years together for the auditor's eyes. All this is the cost saved for the system.

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Specific innovative ideas implemented

INFRACON should improve the quality of project reports and supervision, which should improve the project execution. The benefit of a successfully executed infrastructure project, though difficult to quantify, is huge. As is evident, a manual, subjective, unaccountable process has been turned on its head to give way to an online, objective and accountable system. It has also opened a window of opportunity for all those who want to work for the sector but are not able to get the desired opportunity due to lack of awareness about the projects and the consulting firms that might be soliciting their services. The consultants disparately located anywhere in the country now just have to go online, put out their CV on INFRACON and there is a good chance that somebody will pick that CV up and hire them.

On the other hand, INFRACON has made the task simpler, faster and transparent for the clients as well. Otherwise, it used to take months for evaluating the technical proposals with the element of subjectivity and scope for error being the order of the day.

The extent of integration

This initiatives integrates with all the conventional e-initiatives and secures entire data in itself. It is of comprehensive and exhaustive nature which includes all the data pertaining to bidding of every national highways projects being implemented throughout the country. Ultimate objective is to have an unerring selection of consultants leading to better quality project reports and timely execution of project works, thereby saving large amounts of public money and time.

INFRACON should improve the quality of project reports and supervision, which should improve the project execution. The benefit of a successfully executed infrastructure project, though difficult to quantify, is huge. As the entire portal has been developed in house, the cost of the portal is a meager Rs 30 Lakhs. The return on investment is in multiple digits.

ENABLER INDICATORS

Process reengineering
Major ICT and Non-ICT process

The core objective of this portal is to improve the quality of project reports and supervision of public infrastructure projects; it's therefore no exaggeration to say that the ultimate beneficiary of this project would have to be the citizens grappling

with poor quality infrastructure in our country. The consultancy firms were required to submit detailed Bio-Data/ Resume, which led to voluminous paper work during bid submission. They had to prepare this material for every submission. All this cost obviously got loaded in the proposals to be footed by the state. The same also resulted in herculean effort at the client end to evaluate such CVs and award technical marks. A visit to any of the client's office would present a picture of space occupied by technical documents, essential to be preserved for years together for the auditor's eyes. All this is the cost saved for the system.

On the other hand, INFRACON should improve the quality of project reports and supervision, which should improve the project execution. The benefit of a successfully executed infrastructure project, though difficult to quantify, is huge.

Challenges faced in implementing Process changes
INFRACON brings in transparency and accountability to the bidding and evaluation process, which necessitated the use of Information Technology to bring about a cost effective and easy to use solution to such problems. Against this backdrop, Ministry of Road Transport & Highways asked National Highways & Infrastructure Development Corporation Limited (NHIDCL) to create an IT Platform, which could act as a comprehensive National Portal for Infrastructure Consultancy Firms and Key Personnel.

With this project, therefore, the intention was to bring transparency and enhance accountability in the process of selection of consultants in the roads and highways sector. Ultimate objective is to have an unerring selection of consultants leading to better quality project reports and timely execution of project works, thereby saving large amounts of public money and time.

The Lessons learnt from the Process re-engineering
The first learning from this project is that the use of Information Technology Tools also serves as a platform for infrastructure consultants where individual consultants as well as consulting firms could register themselves. By using Information Technology, one is able to centralize the data but still allowing acquisition of the data at a myriad of decentralized levels seamlessly. This helps in reducing the transmission losses and prevents the data from getting impure. It is also possible to prevent wrongful entries, which may have a cascading effect while sanctioning projects. All across the nation, this portal is an unprecedented information compendium, a first of its kind. In the last one year itself since the first time an initial prototype of the website went live, the number of queries regarding the functioning, and response from prospective bidders and key personnel has been outstandingly overwhelming. It was also learned that transparency in the working of any industry inspires a lot of confidence in the minds of not only those working within it, but also in the minds of the general tax payer. This is evident from the fact that we already have a registered base of 3700 consultants and over 600 consultancy firms registered with us this year. More than 350 projects have also been bidded out through this portal and these numbers are growing by the day.

Leadership, Change Management, Capacity Building during transition
We have conducted several meetings which are high level and finally companies pursued to shift online platform.

Change management and Capacity building strategy
We have created a team of INFRACON, where we are handling the maintenance part of it and we take customers feedback on daily basis. We also help them to sort their problems at our best and provide the resolutions related to their problems and satisfy them.

Financial model adopted
Financial model and layout work were done in-house, it cost a mere 30 lakh rupees.

Special efforts to ensure sustainability of the e-Governance initiative(s)
Bringing in transparency in the bidding of the infrastructure related projects and removing the tailoring of the CVs by the Consulting Firms and the Key Professionals from the picture for fairer trade. Margin for human error has been greatly reduced. The associated cost of human error has therefore also reduced. In this web portal, maintenance cost is very low while saving unexpected human error costs to a great extent. All these factors combined with taking customer feedback, make the web portal very cost effective.

Challenges faced in transition mainly from Change Management & Capacity building perspective
- Firstly, the lack of a common platform led to the formation of a segregated network of bidders.
- The practice of doctoring of CV.
- The system has been designed in such a way that ministry is now able to get online evaluation done by a click of a button.
- Interestingly, to attract people and firms to this portal, government mulled over questions such as why a consultant would be interested to bring information to this portal and it was then decided that the portal could not just be hosting the CVs; it had to go one up and allow the Consultants to bid for projects directly through the portal. An honest individual would never be averse to such a proposition; the need was to bring everybody under the same umbrella.

The portal was therefore made mandatory for hiring consultants in the projects of Ministry, National Highways Authority of India (NHAI), National Highways & Infrastructure Development Corporation Ltd (NHIDCL), Indian Academy of Highway Engineers (IAHE) and State Agencies working on National Highway projects.
- The portal hence opens-up a huge window of opportunity for all those who have the required skills, but are not recognized, to get noticed by the system.

The Lessons learnt from Change Management and Capacity building
All the projects were not under a common umbrella till this portal was developed. There was lack of transparency in the conventional system of project bidding. Time and Cost effectiveness was one of the aspect.

Technology
Technological solution adopted- Dotnet.

Compliance of the Technology adopted: It is compliance with the e- Governance technology.

Strategy for Disaster: As per NIC data recovery and service continuity.

Impact and value-addition thru adaption of Social media: Publicity is being done on social media platforms to make more people aware of it.

Technology related challenges: Before INFRACON was launched, all the projects were not under a common umbrella and hence were not able to be monitored on a common platform.

The Lessons learnt from Technology choices and implementation strategy: With development of INFRACON, all the drawbacks with the existing conventional system of bidding were eradicated completely making it a very efficient and user friendly interface for project bidding.

VALUE INDICATORS
The web portal of INFRACON is a paradigm shift from the past, it brings in greater efficiency and transparency in highway projects. Infracon would make available the largest pool of consultants in the field. At a time, when various stakeholders in real time seek information, transparency and universal access actively, INFRACON provides a viable solution to take the Prime Minister's vision to harness Information Technology forward and usher in a revolution in the Highways sector.

Digital Inclusion
This initiative facilitates stakeholders pertaining to PAN India in a common language of English. Other language options are under concept stage and will be implemented for covering the understanding of stakeholders from all parts of the nation.

Green e-Governance
Due to the launch of INFRACON, paper work has been reduced to a great extent because it allows digital form of biding and evaluation. No disposal of e-waste due to the non usage of new hardware. No need for generating and printing credentials all the time on piece of paper.

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Intelligent Transport System (ITS)
Bengaluru Metropolitan Transport Corporation, Government of Karnataka

Ekroop Caur and C. Nagendra

PROJECT OVERVIEW

Intelligent Transport System (ITS) for BMTC includes Procurement and implementation of Intelligent Transport Solution comprising 10,000 Electronic Ticketing Machines, 6500 Vehicle Tracking Units, 35 Passenger Information Systems LED Boards, Control & Command Centre & Data Centre for 6500 buses entailing Design, Development, Testing, Certification, Installation, Commissioning, Communications, Training, Operations, Maintenance and Management.

Broad Objectives of ITS

- Improve efficiency and decrease operational costs
- Provide real time information on revenue and bus operation
- Monitor, Track and manage service adherence
- Integrated, automate and secured ticketing
- Automate data compilation & report generation to build a reliable MIS
- Act as a one stop shop for all ITS data viewable through a web application
- Analytical tools to plan, analyze and appraise service on various parameters
- Provide service information to commuters through different media
- Manage and handle incidents and accidents
- Encourage modal shift from private vehicles to public transport buses
- Optimized utilization of manpower, bus fleet and other related resources

Intended Benefits

- Schedule adherence and hence operational discipline improvement.
- Centralized and up-to-date Form IV
- Complaints received for rash driving of the drivers are monitored by tracking the vehicles in the ITS application.

Benefits to Commuters

- Due to increased operational discipline, there is increased predictability and reliability of buses to commuters.
- Will get real time information about buses.
- Increased convenience and reduced waiting time to commuters.

ITS is successfully implemented across all the depots and all the fleet of BMTC.

The project was expected to Go Live in eight months from the date of signing the agreement. But it was launched after 33 months due to complexities involved in the project as below:

- ETMs supplied initially got rejected due to non compliance of RFP specifications during testing.
- Vehicle Tracking Units supplied initially was also rejected due to non meeting of requirements during testing. Due to this the OEM was also changed.

- This project is a green field project. Such a project in such a scale with multiple functionalities has never been implemented. Due to this and due to issues in change management, the project was delayed.

Key Learnings

Table: Learning from different Project modules

Project Module	Activity / Observation	Lessons Learned & Future Strategy
RFP and System Integrator Selection	The SI selection criterion in the RFP was changed from QCBS to L1.	In complex and large scale projects such as Intelligent Transport Implementation, QCBS should be utilized to select System Implementers
	SI selection credentials were not comprehensive	• As a proof of past credentials, the RFP asked for submission of WO and/or contract agreements. However, that does not take into account that the past project may have been a recent engagement and thus the SI has no meaningful experience in that field. • The SI should be asked should submit completion certificates from previous clients to showcase their competence in work completion in the related technology/sector. • Sub-contracting should be avoided for major modules of ITS, SI should have ample technical and prior experience in implementing similar projects.
	There has been significant issues in OEM device management w.r.t suppliers of VTU, ETM, Video Wall and PIS	• Proper vetting of the device specifications vis-à-vis RFP requirements are to be carried during evaluation. • The compliance of the devices has to be thoroughly checked vs. the RFP requirement during the selection process itself.
	The RFP included very open ended parameters	All the specifications should be comprehensive and there should not be any open ended parameters.
Project Planning	The project management consultants are brought onboard only after the SI is selected. As a result,	• The ideal time of on-boarding consultants is during the DPR preparation or the SI RFP preparation • The consultants should also allowed to draft the functional and system requirements, thus allowing the SI to

Project Module	Activity / Observation	Lessons Learned & Future Strategy
	the consultants have to engage in fire-fighting rather than being in a position of providing a significant value adds.	focus on their expert area of implementation • The consultants should also be utilized to lay out the entire project activity planning which are to be followed by the SI. • The consultants can have a briefing session with the SI, in the presence of the client, regarding the practices in terms of type of deliverables required, quality and format of the deliverables, approval/sign off process to be followed etc., which would be followed during the project
	Deploying sufficient number of technically experienced resources and experienced project management team.	Require the SI to remain on-site for the duration of the project. This would resolve a lot of communication gaps.
Training	Ideally, training of the staff should happen before rolling out the pilot. During implementation, training activities should be continued in parallel with the development activities.	• Require the SI to provide a detail Training Plan before the Pilot is rolled out. • SI should have a dedicated Training team on board preferably with at least one resource with the knowledge of the local language. • SI should follow the 'Train the trainer' approach and train the staff at the appropriate time and have multiple training sessions.
Operation & Maintenance	Deployment of technically experienced resources for O&M activities.	Staff should be trained continuously on application modification.

RESULT INDICATORS
Key Performance

Through Passenger Information Systems which is part of the ITS Project, the real time information of the buses is being provided at major bus stations through PIS display units. Also through BMTC Mobile Application, the real time information of the buses is being provided for all the bus stops.

Benefits obtained from these services by each category of stakeholders

At Depot Level: The Depot Manager of the respective depots are able to monitor the operations of his depot.

At Division Level: The officer would be able to monitor and manage the operations of the depots coming under his supervision.

At Central Office Level: Concerned officer of the concerned department will be able to get different reports of their interest and hence would be able to monitor and manage the operations.

Commuters:

- Due to increased operational discipline, there is increased predictability and reliability of buses to commuters.
- Will get real time information about buses.
- Increased convenience and reduced waiting time to commuters.

ITS Control Room: Helps to monitor all depot operations on real time basis**.**

Year-wise wise transaction volumes for various

- As a part of Intelligent Transport System Project, 6400 VTUs are installed covering all fleet of BMTCand 10000 ETMs are deployed in all schedules of BMTC. Also 35 Passenger Information display units are installed in major bus stations/ Traffic Transit Management Centres (TTMCs).
- All the VTU devices sends the real time data to central server at every 10 Secs frequency when vehicle is in on mode and sends data every 30 mins when the vehicles ignition is off. ETMs send the data to central server at every 5 mins frequency.

Implementation coverage

BMTC is a metropolitan transport corporation providing services to the city and suburban areas of Bengaluru upto a radius of 48 kms. BMTC covers all sections of people and different types of services are made available to different section of people like Atal sarige services, Suvarna, Volvo and Vayu Vajra services. ITS is installed in all the 43 depots of BMTC. EIA (ETM Integrated Application) and DOA (Depot Offline Application) application is used in depots as a part of ITS and this is used completely to generate waybill abstract, inventory, revenue collection and also to generate MIS reports required daily and monthly. Passenger Information display units are installed in 11 major bus stations/ Traffic Transit Management Centres (TTMC).

New services /scope enhancements

Mobile Application has been provided which helps commuters to know the real time information of buses at bus stops of their interest.

Outcomes in terms of Efficiency, Improvements and integration

As Early arrival and Late departures are being closely monitored, early arrival to depots and late departure are reduced.

Specific innovative ideas implemented

Providing Real time information about Estimated Time of Arrival (ETA) through Mobile Application and Passenger Information System (PIS) displayed at major bus stands.

The extent of integration

Integration with BMTC Mobile Application.EIA (ETM Integrated Application) and DOA (Depot Offline Application) application is a part of ITS

ENABLER INDICATORS
Process reengineering

- Before implementation of ITS project, Conductors were supposed to issue manual tickets. But with the implementation of the project, this process has been eliminated and conductors are issuing the tickets through ETM machines.
- Also conductors were supposed to enter the tickets sold in the waybills for every stage. With the implementation this process is completely eliminated.
- With the implementation of the project, early arrival, late departures, skipped bus stops, route deviations, cancellation of trips are known and this has helped to monitor the above parameter and hence helped in bringing discipline in operations.
- Also real time information of the buses is being made available to commuters at major bus stations and this information gets updated every 1 minutes. This has helped in retaining the commuter loyalty.
- Earlier old system was used for ticket inventory management and with the implementation of ITS, web based application is being used for the same.
- With the implementation of ITS, depot data is being pulled to central server on daily basis.
- With the old system, during audit, ticket sale data was entered manually and with the implementation of ITS, ticket sold data is automatically downloaded from ETM machine.
- Earlier trip wise data was being calculated manually by the conductor and with the new system, this has been eliminated completely as the data is available in ETMs.

Challenges faced in implementing Process changes

- *Change management with a work force of around 36,000.*As the total work force involves all category of people, educating people of different category to adopt to the system and use the system was a huge challenge. This challenge was addressed by giving repeated training to all the category of people. Feedback was taken and based on the feedback application was modified to make it more user friendly.
- *Synchronizing operations of BMTC in tune with ITS.* Ensuring adherence to time viz a viz timely departure, timely arrival, scheduled route operation, stopping at the right location of the bus stops, timely updation of driver, conductor and vehicle. Selection of proper trip in the ETM and updating proper status of each trip.
- *High dependence of day to day operations on network and IT infrastructure.* Any changes made in the form-4, route, etc. has to be synced to depot server in the designated timings. Issue in Network/internet connectivity will lead to non synchronization of data and hence will affect

the day to day operations of the depot. Required data in the ETM and DOA shall get updated on real time basis in the central server - dependency on GPRS, GPS and internet connectivity may affect the said process.

- *Ensuring mapping of correct vehicles to allotted schedules.* As the real time information in PIS display units is dependent on mapping of the vehicles to schedules, mapping of correct vehicles to allotted schedules has to be ensured. If a scheduled vehicle is changed for reasons of Breakdown/FC/maintenance, the newly allocated vehicle to the schedule have to be mapped otherwise this may lead to wrong information display in the PIS display units at bus stations.

The Lessons learnt from the Process re-engineering

- The implementation of automated ticketing system through ETM in ITS has ensured the operations at depot level are executed as per the instructions and guidelines from the Central Office and has eliminated the instances of depots operating with substantial deviation from the actual instructions.
- The degree of errors encountered while entering waybill details on route by conductors were substantially higher and was almost completely eliminated which has resulted in conductors adopting the re engineered process much quicker and easier than anticipated.
- The automated ticketing process as compared to the manual ticketing process has resulted in reduction in tickets books being lost and subsequent misuse and inturn has increased confidence in conductors.
- Information of real time GPRS information has enabled to analyze the stage wise passenger load factor which was difficult in the manual process.
- With the tickets being issued through ETMs, commuter now have all the details with respect to the vehicle, depots, date of travel, time, etc. imprinted on the ticket which has aided commuter in tracking lost baggage/reporting errant driving instances/misbehavior etc in a convenient way as compared to earlier process.
- It was learnt that the gaps in the processes adopted in practice at ground level Vs the prescribed process were substantial and process re-engineering exercise helped in identifying these gaps in addressing the same through re-engineered process.

Best practices adopted

- The requirement was first of its kind.
- The development team should be situated locally.

Leadership, Change Management, Capacity Building

Top Management support was there throughout the project implementation By means of status review of project frequently and regularly. A high level committee - Project Implementation Committee(PIC) consisting of external expert is also formed which will review the status of the project as and when required and take necessary decisions.

Change management and Capacity building
- Continuous training was imparted to crew.
- On site development team supported BMTC to address escalated issues for resolution as and when the issues were reported and also supported to incorporate modifications suggested by users.
- Phase wise roll out was carried out so as to address all the issues faced during initial implementation.

Project management & Monitoring
- Project Management Consultancy has been hired for monitoring and management of ITS project who in turn helps in effective project management through skilled resources.
- Control room has been setup for monitoring of different parameters. It works 24*7 and works in three shifts. Control room people monitor depot operations and communicate to concerned officials for further follow up.

Financial model adopted
BMTC has adopted BOOT model for the project. No funds have been received from Govt. The total estimated cost of the project is Rs. 69.86 crores.

Special efforts to ensure sustainability of the e-Governance initiative
- To ensure sustainability of the project BOOT model has been adopted.
- Ensuring effective monitoring of operational parameters.
- Software modifications and enhancements as and when required to meet user requirement.

Challenges faced in transition
A project like implementation of Intelligent Transport System will involve significant challenges when it comes to addressing the transition requirements from the current AS IS state to the post ITS state. In order to ensure the transition is smooth, it is essential to look at all the aspects that will or likely effect the transition. A smooth transition is possible if all the critical factors are acknowledged and addressed adequately. The following diagram depicts the key areas that need to be examined from a Transition perspective

Figure: Key area in Transition perspective

The Lessons learnt from Change Management and Capacity building
Top level leadership intervention and middle level leadership intervention is very much essential for effective change management. Experienced trainers who know local language are required to conduct training activities.

Technology
Development, Implementation and Maintenance of SW/ HW/ NW, System Administration, are taken care by the vendor selected by means of tender process. Open source technologies are used to the maximum possible extent.

Compliance of the Technology adopted
ITS application servers are hosted at Karnataka State Data Centre on Co-Location Model basis and the required standards and security aspects of KSDC is followed.

Strategy for Disaster Recovery
ITS architecture is designed in such a way that required redundancy is built into the architecture to take care of any failures. Also architecture is designed in such a way that the depot application functions offline without hampering the depot operations. Every depot has a server.

Impact and value-addition thru adaption of Social media
Social media platform helps us to understand the grievances and expectations of our commuters and helps us to improve our services.

Technology related challenges faced
As open source technology is used, support for OS related issues are encountered.

The Lessons learnt from Technology choices and implementation strategy
Experienced resources shall be available on the technology used. The project is divided into phases and is getting implemented in phased manner.

VALUE INDICATORS
Digital Inclusion
The mobile application which takes the information from ITS and gives the real time information to the commuters requires internet connectivity and a smart phone. This may be a limitation for the commuters who do not own a smart phone and who does not have internet connectivity.

Specific steps taken to address this factor
Initiative to provide information through different channels is adopted by means of
- Providing information through Mobile application.
- The people who do not have smart phone may call to the toll free number i.e. 18004251663 and get the real time information.
- The real time information is also made available in the PIS display units installed at major bus station and Traffic Transit Management Centers.

Green e-Governance

Taking into account Green e-Government concept, specific steps taken to address the factor include:

- With the use of ETMs for issuing group tickets, the number of paper tickets may be reduced.
- Reduction in waybill usage due to introduction of ETMs.
- Campaigns are conducted with the help of NGOs.

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Online Driving Licence Issuance in Himachal Pradesh
Department of Transport, Govt. of Himachal Pradesh

Sunil Kumar Chaudhary and Ajay S. Chahal

PROJECT OVERVIEW

With a view to computerizing all the Regional Transport Offices (RTOs) in the country and bringing about uniformity in the Driving License and Vehicle Registration documents issued by the Regional Transport Offices, a project was conceived and implemented. Although the citizens are getting their licenses through a computerized system, they had to visit the RTO/RLA offices personally, multiple times. In order to offer better services, the web-enabled SW was developed by the NIC Central Team and Himachal has been the first State to roll it out in all RTO/RLA offices of the State of Himachal Pradesh, ahead of other States, offering the service of driving licenses to citizens from the comfort of their homes. The Key objectives of the project is to provide

- To provide transparent, timely and citizen centric delivery of services by using ICT.
- Reduction in Time For Delivery of Service.
- Re-engineer the entire processes by eliminating non value adding steps and
- Convenience to the citizens.
- Anytime Anywhere 24x7 service for application submission and e-payment.
- SMS service to the Driving License Holder from application submission to the approval of Driving License.
- Improve citizen perception about the department.
- Citizen Interface with the Department more friendly.
- Increasing the Satisfaction Level of Citizens.
- Providing information to the applicant about the application status through web tracking.
- To provide the service to other stake holders viz. Insurance companies, Police, RTOs/RLAs of India, MORTH, Courts, Banks and other Govt. Agencies for the verification of Driving License.

The main key challenges were:
- To ensure delivery of service based on pre-determined and known timelines.
- De-centralised system was resulting to duplication of data and erroneous master data.
- No mechanism to track and trace the application through web-tracking.
- No system of slot booking for Learner/Driving Test, Online application form Submission, e-payment.
- No SMS/e-mail integration to get the updates of application status.
- No online service for the Insurance, Banks to apply online, Pay online and to get the DL Information online.
- Personal visits to Government offices normally result in corruption and delays on the part of officials.

In order to overcome the key challenges faced earlier with RTO-centric Sarathi1.0 application software has been revamped to Centralized, Web-enabled architecture with single database and application for the whole country. The system is accessible over internet for RLA & RTO users through secured log-in and authentication. Online services are also facilitated to citizen so that for availing transport services, RTO visits can be minimized. The new system will consolidate the database and applications for all RTOs across all states into a common, centralized platform and deliver the core services of Sarathi throughout the country.

In order to start on pilot basis, Himachal Pradesh has taken a lead in the implementation of Web based Driving License issuance software by taking RLA Dharamshala (HP-39) and RTO Shimla (HP-63) on pilot basis. After running for one month lot of issues were faced and were communicated to core development team. After two months additional 10 RLAs/RTOs were taken for implementation ad by the end of March 2016 all the RTOs of Himachal Pradesh were taken and the application has rolled out in whole HP. Himachal Pradesh is the 1st state in India who has 100% coverage of this software. Because of difficult geographic terrain and remote locations the Transport Department and NIC officers posted in the District have done tremendous job in rolling out this application without any PPP mode and with the existing hardware and SWAN connectivity available to all he RLA/RTOs of Himachal Pradesh. No outside agency was hired for providing training to the field staff and it was possible only because of NIC officers posted in the Districts.

Key leanings from the life cycle management of the project.
- The main key learning from the life cycle management of the project is that a proper pilot testing of the project must be ensured before final rollout and proper feedback of the users must be taken before final rollout so that issued faced after final rollout can be minimized?
- The proper availability of basic infrastructure including capacity building, the last mile connectivity and hardware is ensured as per the requirement of the project.

RESULT INDICATORS

The solution is uniformly implemented in the State of Himachal Pradesh covering all the 70 RLA/RTO who are issuing Driving Licenses. Himachal Pradesh is the first state in India who has implemented this software 100%.

Key Performance
- One can submit applications online for New DL
- Online e-payment integration with HimKosh Cyber Treasury.
- The online slot booking for the appointment for DL and LL test.
- Services of LL and DL e.g. Renewal of DL, Endorsement of Additional Vehicle Class, Duplicate DL etc. are available online.
- Uploading of Scanned Documents, Photograph and Signature of the applicant.

- User friendly website with all the information needed for anyone including all the web-fill able forms.
- The address of the license holder is being captured using the e-Governance standards by taking 2011 census Village/Town directory having State, District, Tehsil/Town, Village, Ward along with postal Pin code.
- It provides a one-stop solution for various services in an efficient, reliable, transparent and integrated manner on a sustained basis by easy access through internet using the portal www.parivahan.gov.in/sarathiservice
- Real-time Services to the Citizens
- Tracking of Application Status
- Automated Alerts to Citizens
- Elimination of NOC and Clearance Certificate
- Onetime submission of documents
- Online sharing of data by RTO, State transport department & DoRTH
- Online sharing of relevant information by Insurance agencies and banks
- Use of relevant information by Police department
- Computerized test for learner's licence and online booking for service.
- NOC and clearance certificate**:** Earlier in order to get the Driving License services from the RTO/RLA other than the original licensing authority one had to get the confirmation from the Original Licensing authority about its genuineness and validity of the DL. Now with the new system no confirmation is required and anytime, anywhere service is being rendered to the citizens of Himachal Pradesh.
- Availability for Learning License Mock test. Mock Test is similar to the test which the candidate needs to appear at the RTO office. Each mock test will have 20 questions consisting of a specific number of randomly selected questions. Option to write the exam in the local regional language is provided. The candidate can select any language of his/her choice i.e. English, Hindi, Punjabi, Tamil, Gujrati, Telugu, Marathi and Malyalam. The sequence of the options for selection in a question will change every time a question is picked up from the question bank. The applicant needs to complete this test within 10 minutes. Pass mark is 12 correct answers out of 20 Questions (i.e. 60%).

The above mentioned services and features are some of the initiatives that have made the department not only responsive but also provide services in a transparent manner. The central database helps the department to provide services to the police and other departments on request.

Benefits obtained
The new version of Sarathi4.0 facilitates the citizen to file their application online along with uploading of necessary documents. A unique Application Number is generated for each application filed, which can be used by the citizen to track the status of the application. The online Learner's License Test (STALL) slot booking and e-payment integration with HIMKOSH (HP Cyber Treasury) for payment of license fees and various other services are available through this new system. This web application can be accessed through other devices such as mobiles, tablets, etc.

The SMS integration is also there and the Driving License holder are being intimated about the action taken and when it has been approved and the LL/DL number generated. The e-mail integration is also there for sending the updates of application to the individual.
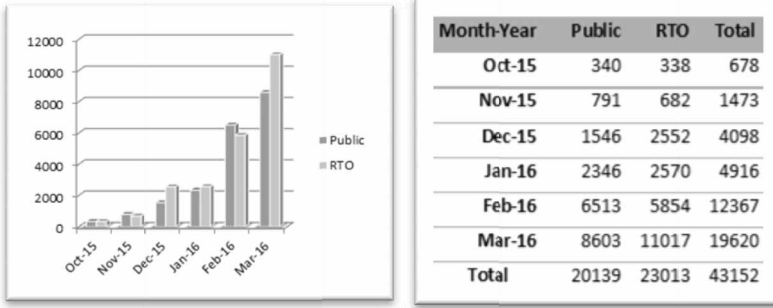
In existing system, the public can search their Driving & Learner License details online and also see the status of their applications. The application status will also show the flow of application in the office and which dealing hand has processed their application on which date and when it has been approved, printed and dispatched. An individual Learner License holder can download his Learner License from the web portal once the LL is approved. The SMS is sent to the individual once the LL or DL is approved along with the LL/DL number. In the earlier system, general public had to visit or contact concerned RLA/RTO office for applying and payment of fees etc. The Motor Vehicle Inspectors can update the Driving License Test results directly from the Driving Test tracks against each application. The RTO/RLA can track the pending application at different levels in his office and all the pending applications in for final approval will also be available. Any applicant coming for any of the services and if the renewal is also due then automatically systems takes care of the same and alerts the individual to pay for the Renewal of Driving License fee too.

If the individual passes the driving ground test for one class of vehicle and fails in another class of vehicle then he has the option to withdraw a service for particular class of vehicle from the public portal to get the Driving License or pay for the rest fee and wait for next driving test. The Govt. of Himachal Pradesh has also opened the Common Service Centre (CSC) up to Village level known as LokMitraKendras in Himachal Pradesh. They are also the stakeholder in this project and are submitting the application on this portal and providing the services to the public living in rural areas of Himachal Pradesh. Besides this, the other stakeholders like insurance companies, Banks, Advocates can apply online for the DL extract where the complete details of Driving license and its history is available. They can get the same by making the online e-payment and can download the same from the portal itself. They need not come to the RTO/RLA office
The SMS and e-mail integration gives the updated details to each individual. It acts like an Information Repository for State Transport Department to know about the Driver's Details, Type of DL issued for Transport & Non-Transport categories, Gender Based DL Data, Summary of DL Transactions, Service wise DL Transactions, Revenue collections etc.

Transaction Status: The graphical/quantitative representation of progress in implementation of Sarathi40. The number of application received from the public portal vis-à-vis application received through RTOs/RLAs.

Month-Year	Public	RTO	Total
Oct-15	340	338	678
Nov-15	791	682	1473
Dec-15	1546	2552	4098
Jan-16	2346	2570	4916
Feb-16	6513	5854	12367
Mar-16	8603	11017	19620
Total	20139	23013	43152

Implementation coverage

The solution is uniformly implemented in the State of Himachal Pradesh covering all the 70 RLA/RTO who are issuing Driving Licenses. Himachal Pradesh is the first state in India who has implemented this software covering entire area of the state. The coverage aspect as a service is beyond the State too as the Driving License holders residing outside Himachal Pradesh can view /verify their Driving License details in Public Domain.

Quantitative implementation coverage in the state is as follows:
- Total Driving License issuing RLA/RTOs: **70**, Solution implemented in all 70 RLA/RTOs,
- Population: 68Lakhs, 10.03 % is Urban and 89.97% is Rural Population and Rural Literacy is 81.85%.
- 89.97% of the Rural including Tribal Population is being served.
- Area: 55,673 square KMs including Trans Himalayan arid zone having toughest terrain in the world.
- The dispersed population having density of 123 people per Sq Km are being served.
- Total Application submitted so far: 1,95,988 since October 2015 till 20th September 2016.
- Half of the applications (50%)are submitted online.

Outcomes in terms of Efficiency, Improvements and integration
- License Holders/Applicant who had to waste time and money by paying frequent visits to get transactions done in concerned RLA/RTOs. The solution in its first phase removed the manual submission of applications and the services are available online on 24x7 anytime anywhere basis and the CSC/LMK and Transport services providers are also providing the services to the public who are not having access to internet.
- Planning and Decision Support: The availability of Driving License data in digital form (database) is helping Transport Department in a big way by providing relevant information for planning as well as decision making. Prior to digitization, it use to be a tedious task to search for a driving license holders, the number of Driving Licenses issued for various class of vehicles etc.

- Responsive solution allows RTOs/RLAs to access the application details on mobile phone and ensure timely approval of services. The RTOs/RLAs need not to sit in the office to approve the cases.
- Integration: The various stakeholders such as Insurance, Police, Banks, and Treasury etc. are able to access the portal for the verification of Driving Licenses and tracking the status of their application. The e-payment has also been integrated with HIMKOSH Cyber Treasury for the entire state of Himachal Pradesh.

ENABLER INDICATORS
Process reengineering

Since the data pertaining to the Driving License are covered under Central Motor Vehicle Act and Rules having legal bearings. Migration of database of entire state from Client server to Web enabled architecture without any data loss and variations and proper data mapping of codes was achieved flawlessly. Because of the availability of centralized database the various processes have been changed for various transactional services. Now the citizens will be able to track their applications. Some of the value added and citizen centric initiatives were included with the implementation of the project e.g.

- Online verification of Driving License details.
- Automated SMS alerts for stakeholders of the system.
- Facility of sending alerts by authorities to citizen on approval of Driving License.
- Mechanism to maintain online Driving License registers, Driving School Details.
- Design of modified web-based data capturing formats for use of stakeholders.
- New data capturing formats have also been developed where ever needed.
- Do away with the process of getting of NOC by the Driving License holder because of availability of Driving License data from central server.

In order to run the web-enabled system there was a requirement of uninterrupted high speed internet bandwidth through the state. The same was achieved through HIMSWAN the state wide area network where it has been upgraded from 512 kbps to 2 mbps even in the remote of the remotest part of the state. After implementation of online services, RTO department has become much transparent and user friendly resulting in faster license issue and application turnaround process time. The applicant can apply for a license online by visiting the online portal of Sarathi service – http://www.parivahan.gov.in/sarathiservice

It is evident from the figures given above that out of 195988 applications received in last 12 months around50% of the applications have been received from the public portal. One can see the success and response of the public in getting the service. It has definitely reduced the number of visits to the RTO/RLA office and waiting time in RLA/RTO office in getting the service. The training to the RLA/RTO staff was also conducted through Video Conferencing Session or by arranging training at respective District Hqs. In Himachal Pradesh only 10.03% of population as per

2011 census data is living in Urban area and 89.97% of population is living in Rural areas and the literacy rate of Himachal Pradesh as per Census 2011 is 81.85% in Rural area. As most the population is living in rural area and the penetration of internet and mobile is very high. In order to serve those who are not having access to Internet are using the services of Common Service Centre (CSC) known as Lokmitra Kendras which are available in each village of the state are bridging the gap of digital divide in rural areas. One can see the application submission data presented above where around 50% of the applications have been entered online and is a good example of digital inclusion.

Challenges faced in implementing Process Changes
- The main challenge faced in starting Online Sarathi4.0 service was :
- How to migrate from existing Sarathi1.0 to Sarathi4.0
- Porting of existing data from Sarathi1.0 to Sarathi4.0
- Continue service delivery while shifting from Sarathi1.0 to Sarathi4.0 without any inconvenience to the general public and various other stakeholders.
- Porting of subsequent pending data to Sarathi4.0 for which transactions were pending in Sarathi1.0 after initial porting of data.
- How to tackle the old transaction which were not completely processed in Sarathi1.0
- Part of the payment done in Sarathi 1.0 after migration.
- Same DL records were available in different RLA/RTO authorities because of previous transactions done. How to take the valid updated records during porting for RLA/RTO data to Sarathi4.0.
- Connectivity in all the RLA/RTOs and even RLA/RTOs of remote tribal areas.
- Mapping of different master tables used in Sarathi1.0 & Sarathi4.0
- The master tables codes were not same in all the RLA/RTOs and to mapping of such table of different RLA/RTOs to Sarathi4.0
- Testing of software on staging server for different types of transactions and issued faced in tackling such cases in Sarathi4.0
- Issues faced during the pilot run at two sites.
- Training to the RLA/RTO staff sitting in remote areas of Himachal Pradesh.

All these challenges were handled and data migration from old to new system was achieved and subsequently pending applications being processed in old software are being pushed to Sarathi4.0 production server on weekly basis by running the Change Data Capture module for differently sites as per the schedule defined.

Future Roadmap
- *Paperless Office:* To make paperless office reality in Government Sector project provides for the submission of online applications and to do away with collection of manual applications in RLA/RTOs. Since the project provides for online submission of application as well as submission of

requisite documents in a scanned form including the URL links from Digi locker, the initiative aims at making it paperless office.

- *Driving Test Results:* Capturing the Driving Test results directly from the Driving Test Tracks. The tablets have been provided to all the RLA/RTOs for capturing the test results from the field. SMS/USSD service for the MVI for sending the Test Results where the when the Internet connectivity is not available at the Driving Test Tracks.
- *e-Payment:* To stop the manual collection of fee in the RLA/RTOs and making the e-payment mandatory.
- *e-District:* Integration of Sarathi services with e-District Project.
- *Driving Training School:* To capture the Driving Training School enrollments.
- *Aadhaar:* Presently Aadhaar number is being captured in the application submission as optional field and it is not mandatory. Once it will be made mandatory its integration can be done with UIDAI database and will help in de-duplication of License records.

Leadership, Change Management, Capacity Building during transition

- The Sarathi4.0 is an end result of lots of efforts of both Transport Department and National Informatics Centre. The system of Transport services are very complicated which makes it vulnerable to procedural delays and non-transparent. However, due to sustained efforts, the implementation of the software has been undertaken to cater the requirements of common citizen to a great extent. The dealing hands are trained on Sarathi4.0 software and general computer awareness training is also imparted. LMKs and TSPs were also trained on the application.
- Imparted Training to all the RLA/RTOs initially at Shimla to give the overview of the system and to get the feedback from them. Further Training was imparted to RLA/RTOs and their staff through Video Conferencing session and effectively utilizing the IT resources. The NIC DIOs/ADIOs posted at the District Headquarters further helped the users in customization and hands on training. Transport Service Providers and CSCs were also sensitize about the availability of various online services.
- Regular monitoring of the project was done by the Commissioner Transport, Govt. of HP.
- Because of difficult geographic terrain and remote locations the Transport Department and NIC officers posted in the District have done tremendous job in rolling out this application without any PPP mode and with the existing hardware and SWAN connectivity available to all he RLA/RTOs of Himachal Pradesh.
- No outside agency was hired for providing training to the field staff and it was possible only because of NIC officers posted in the Districts.
- The training was also provided to all the RTOs/RLAs through Video Conferencing and helpdesk has been created for reporting the problems being faced in handling various types of cases.
- The project itself is self-sustainable as the service charges are being levied for various services.

- The main challenges faced initially was the acceptance of new system by the dealing hands as they were working earlier on Client/Server based application since for the last one decade. In order to migrate to web enabled system the proper training on various modules viz. Learner License, Learner License Test, Capturing of Biometrics, Scrutiny and flow management was imparted to the field functionaries in an efficient manner which made the state wide roll out of the project.

- In the project initiation phase, which the Department planned for any ICT enabled solution should initiate at least computer awareness trainings for the end user staff. This will result in confidence building for the user Department team by the time software development and testing is completed, the end user will be well equipped in using the new solution and will be in a position to give positive feedback for betterment of the solution.

VALUE INDICATORS
Digital Inclusion

- HP Department of Transport has provided trained Transport Service Providers (TSP), who provides services with reasonable charges at localized RLA/RTOs, facilitating services across Himachal Pradesh, serving cross-cultural citizens irrespective of language.

- Sarathi would be used across the state by all users at state, district, Sub. Division, Tehsil and village levels by citizens, Vehicle Drivers& Students. This will also cover the last mile beneficiaries like citizens, students etc.

- In order to cater the requirement of Commercial vehicle Taxi, Bus, Truck Drivers the Learning License Mock test is similar to the test which the candidate needs to appear at the RTO office. Each mock test will have 20 questions consisting of a specific number of randomly selected questions. Option to write the exam in the local regional language is provided. The candidate can select any language of his/her choice i.e. English, Hindi, Punjabi, Tamil, Gujrati, Telugu, Marathi and Malyalam. Similar feature is available when they will come in RTO to appear for the actual screen test Aid for Learner License (STALL).

- The Online system replaces the old age procedure of manual submission of forms and remittance of statutory payments wherein the applicant had to approach to RTO officer and to stand in queue for submission of application and making payment of fee.

- Who are not having access to Internet are using the services of Common Service Centre (CSC) known as Lokmitra Kendras. There are 3000 CSC/LMK already established in Himachal Pradesh.

Green e-Governance

- *Green Initiative:* IT has been used to enable paper-less transaction to the extent possible**.** All the forms as defined in Central Motor Vehicle Rules are being submitted online and the requirement of manual submission of all those forms will be stopped. The Ministry of Road Transport & Highways is amending the Motor Vehicle Rules for the same. No manual

NOC is being generated and printed on paper. The individual record is available online on central database and the Driving License holder details are being fetched and verified online for taking service in another RLA/RTO.

- *Smart & Green Solutions:* But as now all those are available online and are being filled electronically, therefore, saving the time and costs to citizens and hydrocarbon fuel used in motor vehicles on part of the State and Country and contributing towards of clean environment.

- *Paperless office:* By utilizing the online services the Government of Himachal Pradesh is aiming to achieve a Paperless Governance and Cashless transactions. This indirectly has impact on reducing the extra Green House Gases that would have been released, had the citizen travelled multiple times to avail the service.

- *Digilocker:* The Driving License has now integrated with Digi locker under the Digital India programme. With this integration people will no longer need to carry around physical copies of Driving Licences.

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Vehicle Tracking and Monitoring System
Karnataka Road Transport Corporation, Government of Karnataka

Rajendar Kumar Kataria

PROJECT OVERVIEW

Karnataka State Road Transport Corporation (KSRTC) is the largest public transport provider for traveling Commuters in South India. KSRTC covers City, Sub-urban, Rural areas and Long distance routes in across the Six States and one Union Territory. On every day covers 27 lakhs kms and carries 25 lakhs passengers per day. KSRTC main motto is provide safe and secure service to the commuter.

The vision of KSRTC to introduce the Vehicle Tracking & Monitoring system & Passenger Information System (VTMS) project to provide safe and secure services to commuter and to improve its capability in managing the public transport system more efficiently, safely with a commuter friendly approach. VTMS Project aim is to improve the reliability of KSRTC services through effective Operations, Travel Time Management, Incident Management and reduction in the waiting time of the passengers at bus stations. In the same way monitoring operational activities and analysis of the driving behaviour of the crew. VTMS is an integrated system for automatic vehicle location and monitoring from central control station. Core technologies include GPS receiver located in VMU which determines the Vehicle location, position reporting implemented through a GSM Network and supporting information and communication technology infrastructure in terms of hardware and monitoring equipment. VTMS project provides real-time locations of the vehicle through GPS device (Vehicle mounted Unit-VMU), ETA, ETD, number of seats available in vehicles at the source bus station that allows commuters to plan their trips better, complete picture operations and utilization of existing infrastructure for running advertisement campaigns.

In this behalf KSRTC has implemented Vehicle Tracking and Monitoring System (VTMS) in 2000 buses, and Passenger Information System in 27 major bus stations that helps better management of operations, effective, efficient and travelling passengers' satisfaction at large, under Government of India – Ministry of Road Transport and Highways (MoRTH) "Central Assistance for Strengthening Public Transport System" scheme.

RESULT INDICATORS

With VTMS, the staff at various levels at KSRTC shall be able to plan the schedules, allocate personnel, track the compliance through a monitoring system and then initiate corrective action where desired. For this a mechanism of Scheduling and re-scheduling is evolved.

- Scheduling – one time activity to be effected in the application duly allocating bus and crew to a schedule. This will run automatically till such time changes are made in bus or crew.
- Re-scheduling – whenever there is change in bus or crew, than the planned or scheduled one this activity is done for the required temporary period only.

With the above activities, we can see the details by a click on a bus in GIS map/application, real time.

Increase in Productivity to Commuters: With intelligent passenger information system units at bus stands providing information on bus trips, schedules and estimated time of arrival/departure, commuters enhance their productive time with no idle time at bus stands.

Reduction in Travel Time: With well-established communication lines between vehicle, control station, bus stands, ability to manage operations will be enhanced in the event of any emergencies en-route saving property of KSRTC (in such events such as riots en-route) and help to reach the destination in pre-determined time.

Patronage of Public Transport System: With the introduction of this VTMS system is resulting in more efficient transport management, real-time dissemination of information to passengers regarding bus services at bus stands. This will enhance reliability of public transport services and encourage people using personal transport to use public transport system.

Reduction in Accidents / Incidents Management / Breakdowns: With VTMS improving the monitoring, tracking and increased efficiency and management of fleet, it is expected to reduce incidents. In the unfortunate event, use of incident management facility in VTMS, will ensure quick relief in incidents such as holdups, accidents, breakdowns diversions etc.

Key Performance
Vehicle Tracking System (VTMS, PIS & GIS application) to Commuters:
- Real time Vehicle location – On time, Early, Late, location, Time.
- Deviation – Route violation. Severe violations noticed in cases and 6 crew have been suspended by initiating disciplinary action in Bengaluru Central division.
- Distance Travelled.
- Two way communication between vehicle and control room. This is being used in times of emergency.

Driver Behavior & Fuel Management:
- Speed Violation: Replay option is used to show the speed violation of crew and are being educated for KMPL. As compared to 2013-14 & 14-15 there is increase of 0.05 KMPL points in 2015-16 over a period of two years.
- Harsh Braking: This is also being shown to crew in replay option of GIS application.
- Harsh Acceleration: This is also being shown to crew in replay option of GIS application by giving counts in their duties.
- Bye pass operations, skipped stops & bus stands: This check has been done extensively by the users at depots to ensure revenue realization is optimum. In other words, buses that operate through bye pass without passing through the respective bus stands are dealt severely by initiating disciplinary action.

Vehicle Management / Health Monitoring & Preventive Maintenance Alerts:
- Allocation of buses on weekly/monthly etc by way of Scheduling concept.
- Provision for recording daily docking, workshop, RTO passing buses in a separate maintenance menu.
- Alerts (SMS/E-mail) for Vehicle Maintenance, RTO renewals.
- Alerts to DM/DME for maintenance, RTO passing.
- Accident and Breakdown. Crew can use SOS button in the VMU: A pop up will come in the application, it will get clear only on acknowledgement of SOS alert for accident & breakdown in the application screen and so also need to initiate action to support for the same from Central Control Station.
- Available for speed/harsh braking/harsh acceleration. A small beep sound is given for any violation beyond limits specified for the same.
- VMU tampering for any physical damage etc.
- Late Departures from Depot beyond scheduled timings.

MIS Reports:
- Various Operational reports.
- Distance travelled.

Operational Transactions / Management (Depot/Division/Corporate):
- Non-performed Trips.
- Skipped Bus stands, stops, pickup points.
- Regularity, Unauthorized stops, stopped duration.
- Display and playback of a vehicle on Digital Map (history).
- ETA/ETD of a vehicle.
- Line Diagram indicates buses passing in a route facilitates to arrange relief vehicle(accident/BD).
- Duty Rota Allocation of crew on weekly/monthly etc.
- Bunching of Services, Scheduling of services.
- Historical Data for analysis and improvement.
- Analytical data for top management.
- Resolving Public complaints.
- False Hit and Run case can be avoided to a greater extent.
- Increase in Revenue due to passenger loyalty.
- Increase in Revenue due to Awatar / ETM integration.
- Competitive services as against Other STUs/Pvt. operators.
- Alerts for crew license expiry, Inter-State permits, insurance.
- Running Time between Routes / Stops.

Passenger Information System / Commuter Portal:
- The 'Status' of a service with real time and 'Expected time of arrival' / "Expected Time of Departure" is available at any point of time.
- Enquiry of Real Time information by passengers through Web Portal/SMS/PNR No/Trip Code/Vehicle No.

- Time Table - Schedule details for 2000 services (Express &above) of Bengaluru Central, Ramanagara, Mysuru Rural, Mangaluru & Putturu divisions are available in portal for the benefit of commuters. They can plan their trips and reserve to it, as a link is given to www.ksrtc.in (for booking tickets).
- Increase in commuter satisfaction due to reduction in uncertainty. However, we are awaiting for commuter responses through part of 'on-line survey' & 'feed-back' system given in the portal.
- A link is given in www.ksrtc.in to 'Track Your Bus'. We can also access the Commuter Portal in http://vtms.ksrtc.in/KSRTC-VTMS_new/

The Key performance parameter of the Project is as under;
- Vehicle Mounted Unit (VMU) installed   1972 nos
- Spare VMUs   28 nos.
- Tracking Percentage   88% to 93%
- Execution of Schedule mapping at depots   75% to 83%
- Passenger Information System Boards   87% to 93%
- Expected Time of Arrival/Departure   83% to 89%

Key Project features
- Tracking the Buses, Domestic Vehicles on Real time and history
- Calculating Expected Time of Arrival/Departure of buses
- Automated Fleet Scheduling & Daily Rescheduling
- Calculation of Revenue KMs and Dead KMs based on requirement
- Displaying Bunching of buses
- Two way communication between Central control station to the buses
- Running Campaigns in display board
- Tracking the driver behavior on Real time and history, Driver Behaviour capturing & alerts
- Replaying the actual travel path of the bus
- Various MIS Reports to assist with KSRTC Operations
- SMS & Email Alerts on Accident, Break downs, Late Departure, Crew License expiry, FC Renewal, Vehicle Insurance.
- Dynamic Status Report
- Recording Bus Maintenance Activities
- Master Data for Crew, buses, Schedules, Form4, etc
- Live Information to Commuters using Commuter Portal , SMS and PIS Display boards
- Integration with AWATAR through Vacant Seat Information, ETM for real time seat availability, Displaying the vacant seats in Display Boards
- Crew/Vehicle license Expiry monitoring
- Vehicle Performance dash board

Outcomes in terms of Efficiency, Improvements and integration

Table: Outcome/Utilities Derived from this VTMS System for the last 18 months from March 2015 to August 2016

Details	In Nos.
Accident and Breakdown Analysis	104
Educating Over Speeding Drivers (Dr. Behaviour)	1445
KMPL Tackling – Mileage	341
Schedule Operations Analysis	564
Real Time Location for various reasons	109
KMs comparison including CC Kms	47
Running Time Analysis	12
Irregular Operations	6
Information used for Intelligence/complaints resolving	48
Resolving Awatar and Public complaints	59
Disciplinary action against erring crew	109
Others – crew license and FC expiry	29
Total	**2873**

ENABLER INDICATORS

Process reengineering
Major ICT and Non-ICT process
Functional Requirements – a set of functions which the module must meet in realizing the objectives of the stakeholders. This part meets the "What" is required of the solution. As a part of this, 125 Functional requirements have been evolved for a solution in the project.
Technical Requirements – a minimum set of features that will help in realizing the functionality of the system. This part meets the guidelines of "How" the solution is conceptualized. As a part of this, 91 Technical requirements have been evolved for a solution in the project.

The details of the same are enclosed in a separate MS Word document. Currently, the System Integrator has provided solutions and completed all the Functional and Technical requirements (excepting for some reports, which will be designed during operations and maintenance based on the operational requirements).

Likewise, the changes effected to the system by additionalities or new or change requests are documented suitably. A separate MS excel sheet is enclosed for perusal.

Challenges faced in implementing Process changes
Challenges faced before deployment of the project
- GIS Survey of 63000 KMs across 7 States of South India with required Landmarks,
- Geo-fencing particular stops, bus stands, Landmarks,
- Creation and validation of Routes, schedule data, etc.,

- Scheduling and Rescheduling (dispatch mechanism) by depots,
- Trip Recognition of a Schedule in the beginning,
- Connectivity issue in ghat/remote areas in some depots,
- Place of fixing and power drawal to VMU. A comprehensive study of type of buses were made to under the physical structure of the bus to fix VMU, so also power drawal before cut-off switch or after this switch.

The Lessons learnt from the Process re-engineering

Key learnings to Transport Sector (all STUs) as a whole:

- Designing Standard Proto Type Optimum level Vehicle Monitoring Unit. STUs are handling complex bus types in terms of BS-II, III, IV, CAN bus etc, operational features, whereas in the Telematics Field a lot number of VMUs/OBD/ITS kits are readily available. This creates selection difficulty among STUs to opt a particular type of VMU. Therefore, there is need to design for an optimum level VMU that can give minimum VTS features as default and the other features like CAN, security camera, VHMD, etc as optional.
- Campaign Management activities to earn revenue by using PIS display boards at bus stands.
- Inclusion of all independent Depot System for integration. Currently, all STUs are planning for Vehicle Tracking System (VTS) spending huge budget and without any centralized solution for capturing revenue parameters also. Therefore, it is high time for STUs to go for comprehensive ITOMS (Integrated Transport Operations and Management System) inclusive of VTS.
- Better Technical solutions to connectivity like analyzing the GPS, Glonass, Gagan etc and recommend for the best one by an appropriate authority duly guiding STUs.
- Actual Travel Time (Running Time) Analysis for differential Form IV (indicating schedule timings). Currently, Form IV is common to a particular schedule that will be operated at any point of time, say peak or slack or day or night. With the availability of travel time between two points for a given time like peak or slack or day or night facilitates management to think new concept of flexi Form IV for a route or schedule.
- The entire VTS + systems shall cover both physical & financial transactions (ticket revenue, other revenue accounting, all types of expenditure), instead multiple solutions. Currently, STUs are having multiple systems to capture physical parameters or financial parameters by spending huge budgets. In the absence of one unified system, STUs are depending on multiple systems say 50+ or so to get their required results. Therefore, this is high time for STUs to think for one unified system, may be ITOMS which covers both physical and financial transactions under one system.
- Providing emergency Panic Button near to the seats of commuters to raise Alerts to central control station to ensure safety and security of Women and Child.
- Comprehensive ITS solutions beyond tracking aiming towards ITOMS.

- Provision for Multi Modal Integration options along with city and metro transport.
- Preparation of ITS/VTMS Tool Kits by Government Agencies and provide it to STUs. Since STUs are new to ITOMS and VTS technology, standard ITS and VTMS tool kits may be designed by Government Of India or its agencies or by private agencies, so that STUs can follow accordingly for smooth implementation.

Best practices adopted
Currently, the RFP prepared for this project is based on the benefits that could be derived and delivered to Commuters at large and also as per the standard internal operational transactions in KSRTC.

KSRTC is in lead role in the implementation of ITS solutions for better operations management and to provide better, safe services to commuters from time to time.

Leadership, Change Management, Capacity Building during transition
A Project Management Committee headed by the Managing Directors and Director (Security and Vigilance) as member, a few Heads of Departments form Traffic, Mechanical, Stores etc will lead the initiatives, guide, monitor actions from time to time.

Change management and Capacity building strategy
As of now, Systems Integrator (SI) will monitor the overall implementation, operations and maintenance of project for a period of next three years. Change management is defined at the time of end of completion of operations and maintenance after three years. Exit management is well defined.

Initial Capacity Building of about 8000+ crew and 89 workshops for 1100+ office staff has already been completed for effective implementation of the project by System Integrator/KSRTC from time to time. Technical capacity building is scheduled in next 6 months' time.

Project management & Monitoring
A Project Implementation Unit headed by Chief Mechanical Engineer (Production) and a few other Heads of Departments from Traffic, Mechanical and Stores will monitor the overall implementation of the project duly guiding the depots and divisions from time to time.

Similarly, a Project Implementation Unit at the Divisional Level headed by Divisional Controller and a few other Sectional Heads from Traffic, Mechanical, civil and Stores will monitor the overall implementation of the project duly guiding the depots, bus stands from time to time.

Financial model adopted
Sources of funds 50% by MoRTH, Government of India and 50% by KSRTC. Total Cost of the Project comes to 12.90 crores.

Challenges faced in transition

As of now, there are no hurdles from change management perspective. However, while capacity building to crew (conductors and drivers) was challenging in the initial stage of explaining them of the initiative and its benefits to all the stakeholders. Now, crew are comfortable with the benefits derived out of the project.

The Lessons learnt from Change Management and Capacity building

While conducting 89 capacity building workshops, SI team & VTMS Cell team travelled across 27 depots 4 times and could complete the task. Such workshops are in progress across all depots of KSRTC. This process is a parallel activity. As on date, 8000+ crew and 1100 staff are being trained in the Project.

Technology

Technological solution adopted

Reliance GPS, GSM and MPLS cloud technology has been adopted for tracking and transfer of data to the data center. Hardware environment consists of HP tower server models with suse linux 11sp3, Windows Server 2008 R2 Standard and CentOS release 5.4.

Compliance of the Technology adopted

This system is designed with usage of defined company standards, Application is designed based on Oracle 11g, Java 7, hibernate and spring framework with Apache tomcat runtime environment.

Strategy for Disaster

Clustering of servers is used for handling all possible failure and increase reliability. Also regular backups are taken. Every server is provided with backup servers which will increase the efficiency of handling the failures. Zenoss tool is adopted for the monitoring servers and network related components.

Impact and value-addition thru adaption of Social media

PIS display boards and commuter portal plays a major role in providing required information to the end users. Also Add-manager tool is used to keep track of the advertisements.

Technology related challenges

Main challenges faced were GPS satellite availability and GSM coverage not available for some areas (Specially in Ghat sections).

The Lessons learnt from Technology choices and implementation strategy

In order to overcome loss of data in above mentioned cases Post-processing had been employed. Data related to packets are stored in SD card present in VMU, on availability of network these data is fed into system and processing is done accordingly and reflected in application.

VALUE INDICATORS

KSRTC has been leading the state of art technology initiatives covering the reservations system- AWATAR, Intelligent Transport System in Mysuru, electronic ticketing machines, Leave KIOSK management system, duty rota system and many

others. The National Urban Transport Policy as laid out by the Ministry of Urban development "is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs with our cities".

KSRTC is building intelligence in to the transport system brings in the convergence of technologies providing a synergetic transformation in the commuter experience. This projects aims at establishing sustainable transport which is not just a case of increasing the infrastructure available, but also question of maximizing the use of existing infrastructure and of maximizing the efficiency and interoperability of all transport assets. Upon implementing this project with VTMS solution gets more and more complex based on the size of the transport network to be addressed and intricacies of traffic conditions. Changing the traditional ground transportation scheme to a fully automated and intelligent transport network is a substantial upgrade of the scheme. Apparently the main problems that are hampering to materialize are not just technological limits, but cultural, conceptual, social emotional, political and economic hurdles. The bigger the geographical area of operation the more complex this becomes.

Digital Inclusion
Currently, all the stakeholders of the project comes under digital inclusion. However, under Travellers/commuters category, illiterate/rural passengers may not easily access to VTMS project and its technology buildings into the system.

To overcome this, KSRTC, currently using a separate Passenger Announcement System at Bus stands duly announcing the bus no, platform no, departure time in local language to benefit the passengers instantly. This separate system is under consideration for integration with VTMS in Phase II. Likewise, mobile application is under development in English and Kannada version for benefit the passengers. Further, it is also pertinent to mention here that the passenger/travellers that lack on-line activities mentioned below;
- access - the ability to actually go online and connect to the internet
- skills - to be able to use the internet
- motivation - knowing the reasons why using the internet is a good thing
- trust - the risk of crime, or not knowing where to start to go online

To make the above into positive, the role of Society/Government at large is also important to include ourselves to Digital Inclusion to reap the benefits of VTMS.

Green e-Governance
- Currently, in VTMS project reports are designed in such a way that the reports or master data could be exported or imported at any point of time. This initiative is more towards aiming at paperless office. This data can be exported to MS Excel and required data or summary can be printed. This is user friendly system developed in VTMS. It is also instructed to keep the reports in electronic form than in paper form, so as to conserve environment, rather to curb the usage of paper.

- All correspondence pertaining to VTMS project is paperless (unless it is used in local Kannada Language) and majority of it happens in electronic form (e-mails) including reports generation, analysis etc. across 27 depots. It happens through vtms@ksrtc.org and vtmsksrtc@gmail.com .
- Likewise, in KSRTC, currently, the life of Computers and its accessories (as an Asset) is 5 years. Once these reach end of life new procurements are made and the scrap/e-waste will be disposed of by way auction, as per our IT Department process.

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Item Tracking System
Bharat Heavy Electricals Limited, Government of India

Shikha Saxena

PROJECT OVERVIEW
AIM-The project was taken up, aiming for Improvement of Customer Service and Internal management of project information.

Motto-To help deliver Projects and Quality Products in time and committed to enhance Customer Delight via Continuous improvement in the system.

Item Tracking System is an In-house developed project monitoring cum document sharing tool.

It caters to needs of customers and employees of BHEL Bhopal with following Objective:

For Customer
- Online tracking of orders item wise
- Get the status of manufacturing and dispatches done
- Prioritize their orders
- Have direct access to BHEL documents uploaded related to project.
- Reduce Cycle time
- 24 X 7 Monitoring Tool for customer

For Internal Employees
Site officials, commercial department and manufacturing department, it is a tool for
- Entry and management of project information
- Monitor the project stages online as per process flow
- Prioritize the job by commercial department
- Online receive the job priorities from customer and commercial by manufacturing department
- Have access to customer documents online
- To Make BHEL Documents/maintenance manuals available to Customers/Site Employees

RESULT INDICATORS
Key Achievements:
Technical benefits:
- Real Time availability of status of items being manufactured in BHEL.
- Reduction in response time to stakeholder's query
- Intimations by Mail
- Minimized manual Query redressal
- 99.99% Availability of Services
- Complete Transparency & Online Monitoring
- 100 % accuracy & Zero Delay in Processing Information

Economic benefits:
- Approx. 50 Lakhs / (Recurring) annually
- Zero outflow of company cash on software development and maintenance due to full in-house development.
- Cost saving from paper reduction
- Cost saving through reduction in tours
- Cost saving through elimination of daks/courier

Social benefits:
- Enhanced Customer Satisfaction & Employee Productivity
- Image and Trust Building of the Organization
- Standardization of Process and reusable solution
- Provide complete Transparency
- Reduced Turn Around Time from 15-20 days to real time access

Key Performance
- Government to Employee
- Government To Customer

Benefits to Employees:
A common application is developed for entry of project information and workflow of information from 1 department to another.(Customer -Commercial department-Engineering Department-Manufacturing Department-Logistics Department –Site-Customer)
- Monitor the project stages online as per process flow
- Prioritize the job by commercial department
- Online receive the job priorities from customer and commercial by manufacturing department
- Have access to customer documents online
- Provide BHEL Documents directly to customer
- Make maintenance manuals available to Customers/Site Employees
- Continuous improvement through feedback
- Develop a Standard, flexible and reusable Solution
- Provide complete Transparency
- Cycle Time reduction

Benefits to Customer:
- Online tracking of orders item wise
- Get the status of manufacturing and despatches
- Prioritize their orders
- Have direct access to BHEL documents uploaded related to project.
- Reduce Cycle time
- 24 X 7 Monitoring Tool for customer

Services per Year
- Number of Projects   : 2091 nos
- Number of Work orders   : 5834
- Number of items tracked : 53345

Implementation coverage
Geographical Coverage: Can be accessed from anywhere across the globe

Implementation coverage: It caters to huge customer base of Indian Railways :

> Central Railway, Clw Dlw Dmw East Central Railway East Coast Railway, Eastern Railway, Icf, North Central Railway, North East Frontier Rail, North Eastern Railway, North Western Railway, Northern Railway, Rcf Rly Board, South Central Railway, South East Central Rail, South Eastern Railway, South Western Railway, Southern Railway, West Central Railway, Western Railway.

The new services /scope enhancements planned
- Integration of system with companywide eDoc Sharing Mobile App, making item tracking available through mobile App.
- Receipt of Job priorities through mobile app.
- System to be extended for all customer and products
- Include MM project status.

Outcomes in terms of Efficiency, Improvements and integration
After the implementation of Item Tracking System, following improvements have been achieved.
- Automation of manual process
- Facility of online creation and workflow of information between different departments.
- Reduction in errors due to human intervention.
- Standardization of Process.
- Reduced Turn Around Time from 15-20 days to real time access
- 24X 7 availability of system as monitoring and management tool.
- Direct information from database has resulted in complete transparency.
- Feedback mechanism / Status updations

Integration
System Information is collected and processed from different sources (Customer, Commercial department, Engineering Department, Manufacturing Department, warehouses, Logistics Department, Site) and given at a common platform.

Process changes made:
- Creation of Directories–Drawing, price list, items, customer, ccn, approver, customer etc
- Facility for online entry of documents.
- Creation of workflow
- Pendency reports in different formats
- Online prioritization
- Central storage of documents generated.

Technology interventions:
- Every transaction / action is being stored with Date, Time and User Name
- Single Sign-On Authentication with encrypted password
- Role based access to the system.
- The data is being stored in clustered environment using Disaster recovery mechanisms like data mirroring, which ensures high-availability of data(24X7 Availability)
- No Data Loss: The data is being backed up on daily, Monthly & yearly basis
- The data is being stored in clustered environment using Disaster recovery mechanisms like data mirroring, which ensures high-availability of data
- Network– INTERNET 30 MBPS, VPN- 16 X 2 MBPS (REDUNDANCY), LAN – 10 GBPS to ensure high availability.

Time and cost efficiency improvements:
- Reduced Turn Around Time from 15-20 days to realtime access per customer requirement
- Annual cost saving of approx. 50 lac

(Includes Cost saving in terms of manhours, Cost saving in terms of paper cost for Internal documents, monitoring-review Reports, Cost saving in terms of courier / daks communication facility, Cost saving in terms of Installation manual prints, Customer documents)

Extent of integration with other systems:
- Personal System (Authentication, roles)
- IT management system (change management, problem reporting, resolution, review)
- Integrated Quality management system (checks ,validations, Inspection certificates)
- Corporate Site management system (Site related details and issues)
- Finance Invoicing system (WO value and items manufactured ,to be despatched)
- MM system (checks, validations w.r.t Workorder indenting, PO, store receipt voucher)
- Stores system (Workorder material availability and issue)

ENABLER INDICATORS
Process reengineering

- Study of manual process followed, manual data maintained, documents generated
- Identify the Scope and Prepare application development plan
- Finalization of Item Tracking System Project Team -3 from IT, 1 user coordinator
- Conducted As-Is Exercise for Process being followed
- Conducted To-Be Exercise for Processes
- Identify Gaps and Process Improvements

- Study of Resources available
- Technology, manpower, network framework, client side accessibility, software, hardware Freezing of Requirements and Logics
- Create system logics
    - Inputs-Outputs
    - Processing Logic
    - Functionality logic
    - Information Security Logics
- Develop a Working Design or SRS (System Requirement Specifications)
    - Performance and accessibility requirement
    - Interfaces and Linkages in departmental process, with other systems
    - Development Environment – based on accessibility, technology available and expertise of IT, user requirement
- Developing Codes based on Design criteria
    - Deployability Issues

Testing and Implementation

- Item tracking application and development was done on development and testing environment
- Test cases were developed ,testing was done by IT system in-charge, approved and reviewed by reporting officer and user
- Continuous monitoring and review of implementation was done by HOD
- After through testing, system was moved to production environment, again testing was done by internal team, followed by user team.
- Problem reported /change management is catered through IT management system.
- Phase wise implementation done.

Challenges faced in implementing Process changes

- User were used to old practices
- Creating user awareness about new system-process and application
- Some unidentified activities came out after design was finalized, application development which needed system modification
- Availability of clean data, Constant monitoring of data posted and mismatch to be removed on priority.
- Cross functional user expectations to be catered

The Lessons learnt from the Process re-engineering exercise

- As-Is process study should not miss out any process
- Team must consist of Members from each function involved in process .
- Additional Resource requirements to be identified before project

Best practices adopted

ISO 9001 certified application development process

- ISO 27001 Information security management certified policies and procedures are followed.

- BHEL internal process (system management Instruction, departmental management instruction followed)
- OWASP application security testing standards and recommendations followed.

Leadership, Change Management, Capacity Building during transition
Leadership support
- Review of requirement, monitoring of development and maintenance.
- Facilitation for necessary resources.
- System Implementation related monitoring and review at all stages.
- Quick decision in case of discrepancy.

Change Management
Change management–An internal process (Working management instruction - 25C,BHEL,Bhopal) is being created to address to change management needs of the user.

New requirement identified, problem reported, small changes request are being catered through workflow based IT-management system. User gives their requirement details and probable implementation date which is approved by user HOD. This is send to IT HOD.IT HOD approves and send to concerned system incharge. IT system incharge does the study and discussion and gives the PDC, if requirement found feasible. He does the changes, maintaining all documents like feasibility study, SRS, testing records in the system. Request is closed by system incharge approved by IT HOD and by user. Email intimation is send to user at every stage and monitoring done through online reports.

The Lessons learnt from Change Management and Capacity building
- Feasibility Study must be done thoroughly covering all aspects of development i.e resources required, team members to be involved, development methodology
- Incoming information and outgoing information from application must be clearly defined
- SRS to be approved by all team members before development phase
- User training must be done thoroughly
- Standardization of process and record keeping is essential.

Financial model adopted
100% in-house development and maintenance, hence zero external cost was involved.

Special efforts to ensure sustainability of the e-Governance initiative
- Use of Standard Practices
- ISO 9001 Quality Standards followed for development process
- ISO 27001 Security Standards followed for information security and its maintenance.
- Every year 3rd party Audit and Internal Audit is conducted to know health of system.

- System is Operational for more than 1 year.
- The Project has proved useful to all stakeholders (Customers, Employees and management) in facilitating their day to day activities, monitoring and reviews.
- In House developed. Therefore it is customised for BHEL Practices.
- Standard practice is followed for continuous changes and improvement in system based on user feedbacks.
- Standardization in Practices through process Improvements.

Technology used:
- **Front-End**
  - Active Server Pages / Dot Net
  - HTML, Jquery/ JavaScript
  - Oracle Forms and Reports
- **Database:** Oracle 11g
- **Hardware:** High-End IBM P780 Servers / Client PC with N/W connectivity
- **Security**
  - Role based Single Sign-on
  - PAROS For Application Security
  - Penetration testing by external agency
- Mitigating Application Security challanges like sql Injection, cross site scripting etc –
  - this was tested with Open Source testing Tool PAROS and steps taken according to recommendation given for testing.
- Standardizing document storage–Only PDF allowed with maximum 8 MB size.
- Use of technology which can run from internal LAN, Customer End and Sites.
- Cyber Security guidelines, advisory, and alerts are received by BHEL from concerned national nodal agencies in Government like NCIIPC and CERT-in as part of Government's efforts to ensure safety of cyber-space in India. Action as suggested by them to mitigate the risk is taken and awareness created among users through internal mail.
- Penetration testing of application is conducted by 3rd party once in a year to identify various vulnerabilities which may be exploited by hackers. All the vulnerabilities reported are closed and re-checked by the 3rd party to ensure proper closure.
- BCP and DRP**-**All critical services have been configured in clustered mode with near DR within the same premise. All the services are shifted to near DR site once every 6 months to ascertain Business Continuity in case of any disaster at DC. The far DR is located at Corporate IT, Noida.

Backup and restore policies have been established and implemented with appropriate data retention as per policy. The backup media is regularly tested for restoring system to point in time recovery.

The Lessons learnt from Technology choices and implementation strategy
- Technology used for system should be user friendly and secured.
- Data to be stores at central storage with backup facility and disaster recovery mechanism.
- Tracking of changes done by users transaction level should be possible.
- Proven technology to be used to make system accessible from different location through LAN, VAN and internet.

VALUE INDICATORS
- Online system for monitoring of project supplies from manual process to Online
- Standardize the Processes
- To consolidate different reports and hard copies.
- Huge huge amount of items data
- Get customer priorities.
- Online searching, scrutinizing
- Reduce Manpower involvement
- Reduce Turnaround time
- Reduce Job related Customer queries
- Reduce Person dependency

Digital Inclusion
All the Documents and reports are developed in English, which is common means of communication throughout India.

Green e-Governance
- Reduction in paper print usage for internal documents, which have been made online like Customer Information (PO details), Work Order (Commercial Group), Handing Over Documents– PFR (By Manufacturing), Dispatch Document & LR Document (Logistics).
- Reduction of paper movement for monitoring and review
- Reduction in postal services by Internal Employees and by Customer.
- Use of centralized Server Consolidation Technology and Blade servers for Energy Saving.
- All the hardware resources used are on leased basis and are being maintained by Service providing agency. BHEL ensures the clause of proper E Waste management of IT hardware in the contract.

Mrs. Shikha Saxena, *Senior Manager, ITS, Bharat Heavy Electricals Ltd. Bhopal, ITS (Informatics Center), email id: shikha@bhelbpl.co.in*

Mobile Seva - Nationwide Mobile Governance Initiative
Ministry of Electronics and Information Technology, Government of India

Kavita Bhatia, Zia Saquib and Kapil Kant Kamal

PROJECT OVERVIEW

The "Mobile Seva", an initiative of Government of India aims at mainstreaming mobile governance in the country as a compelling new paradigm for delivery of public services electronically through the mobile platform. It stems from the realization that penetration of mobile phones in the country is much higher (more than 80% populations) compared to access of internet through computers and, especially in rural areas. Hence, mobile platform helps tremendously in increasing access to electronic services, especially for the rural population. Mobile devices are ideally suited as alternative access and delivery channels of public services in these areas. Mobile devices can also provide certain services that are unique to this platform, e.g., location based services. As the prime driver of electronic delivery of public services, the National e-Governance Plan (NeGP) of Government of India takes a holistic view of e-Governance initiatives across the country, integrating them into a collective vision. The ultimate objective is to bring public services closer home to the populace, as articulated in the vision statement of NeGP: "Make all Government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs to realise the basic needs of the common man". As an extension of NeGP's vision, and in cognizance of the vast mobile phone subscriber base, the Government has decided to also provision for access to public services through mobile devices, thereby establishing mobile governance (m-Governance) as a compelling new paradigm within the ethos of e- Governance in the country.

To take this forward, DeitY launched Mobile Seva as a new countrywide initiative in 2013 on mobile governance to provide public services to the citizens through mobile phones and handheld devices. As a part of this initiative, a centralized platform named Mobile Service Delivery Gateway (MSDG) has been created by DeitY through its technical development agency, Centre for Development of Advance Computing (C-DAC). Mobile Seva platform has been developed around open standards and cloud-based solutions and is a key implementation strategy under the Framework for Mobile Governance that was notified in February 2012.

The prime motivator for this initiative was the realization that massive and growing penetration of mobile phones in India which can substantially enhance access to electronic services, especially in the rural areas. In India, the sparseness of landlines, particularly in rural areas, coupled with the relatively high cost of PCs, has kept Internet usage very low. Mobiles are fast bridging the digital divide, and have become the most convenient channel for people to access information and communication based services for work, education and leisure. This emergent scenario provides a ready and widespread base for access to and delivery of public services electronically. Another motivator for this initiative was that its implementation complemented efforts to realize the vision of the National e-Governance Plan to bring public services closer home to citizens at affordable costs. In the country, Government departments and agencies at central and state levels

touch over 1.2 billion citizens in their day to day lives. Implementation of Mobile Seva bring all these government departments and agencies at central, state, and local levels on to this common platform and reach over 900 million mobile subscribers in the country with public services. The "Mobile Seva" project, aims to provide a one-stop solution to all the central and state Government departments and agencies across the nation for all their mobile based service delivery needs. The objective of the initiative is to provide a centrally hosted cloud based mobile enablement (m-enablement) and mobile based delivery (m-delivery) infrastructure and platform that allow all Government departments and agencies to expeditiously start offering their services through mobile phones without having to invest heavily in creating their own mobile platforms. Mobile Seva enables integration of mobile applications with the common e-governance infrastructure for delivery of public services to the users. Availability of Government's wide shared infrastructure and services enables rapid development and reduced costs for the integrating departments. Already over 2550+ Government departments and agencies across the country have integrated their services with this platform (with more than 10+ billion Push SMS transactions flowing across), and the numbers are growing by the day.

RESULT INDICATORS
Key Performance
There are various services being delivered using Mobile Seva platform

Table: Mobile Seva Services

Service Type	Students	Parents/Workers	Citizens
Enquiry	Fellowship, Games and Sports	Pensions, Government Orders	Employment, Government Benefits
Registration	Competitive Examinations, Part Time Job, Employment	Driving License, LPG Connection	Vehicle, Voter, Right To Information (RTI)
Status	Passport, Bus Pass	Reservation, Doctor's Appointment	Train, Flight, Medical Report
Alerts	Strikes, Examination Schedule, Last date of submission	Power Cuts, Due date for payment, Vaccination	Traffic, Weather
Search	Charts, Map, Contact details, Employment Opportunities	Address, Location, Statistics, Tourist Place	Directory of m-Governance Services
Results	Examination	Diagnostic, Policy Maturity	Election, Selection
Certificate	Birth, Pass, Character	Income, Medical Certificate	Community, Domicile, AADHAR

Service Type	Students	Parents/Workers	Citizens
Payment	Tuition Fees, Payment Receipt	Property Tax, Income Tax	Utility Bills, Service Tax, Pension
Cost	Application, Registration	Insurance Product, Diagnostic Tests	Loan Items, Collateral
Authentication	Photo Identity, Password	One Time Password, Captcha Code	AADHAR, Digital Certificate, Iris, Biometrics
Location	Vaccination Centre, Examination Centre, Play ground	Bank ATM, Hospitals, Cultural Event, Function Hall	Voting Booth, Diagnostic Centre, Emergency Service
Voting	Eligibility	Party Symbols, Opinion Poll	Candidates Profile, Casting a Vote
Awareness	Road Rules, Facilities, Opportunities	Hygiene, Cleanliness, Consultant	Pollution, Social Responsibility
Guidance	Career, Fitness Exercise, Moral Values	Insurance, Crop Yield, Marital Counselling	Investments, Health Indicators, Specialist
Education	Courses, Virtual Lab, Simulation Games	Financial Literacy, Skills Development, Pollution, Clean and Green Environment	Rights and Duties, Social Responsibility
Medical	First Aid, Vaccination	Diagnostics, Test Costs and Reports	Re-imbursement, Insurance
Police	Theft Reporting	Vigilance, Cyber Crimes	FIR Format
Emergency	Mishaps, First Aid	Accidents, Ambulance	Fire, Earth Quake, Medicine
Complaints	Punishment, Eve Teasing, Ill Treatment, Sound Pollution, Child Abuse	Harassment, Excess Fare, Food Adulteration, Pest Control Spray, Misbehaviour, Road	Water Supply, Street Lights, Locality Cleaning, Improper Maintenance, Exploitation, Drainage

The main benefit that Mobile Seva brings is its boundary breaking potential: truly allowing working on an anywhere, anytime basis and helping to create a truly integrated digital nervous system for government. Because of its immediacy and

convenience, it also reduces the barriers to public service operations, encouraging citizens or service providers to make use of the technology where previously barriers were discouragingly high. Providing information to the public is not a trivial activity. It is the foundation of citizen empowerment. Without relevant information citizens are unable to form intelligent opinions and, thereby, are unable to act on the issues before them meaningfully. Mobile devices provide an important access channel for governments to reach citizens (G2C).For example, **mKisan** project under Department of Agriculture and Cooperation(DAC), Ministry of Agriculture, Government of India is using Mobile Seva platform extensively. mKisan Portal for farmers enables all central and State government organizations in agriculture and allied sectors. It facilitates providing important information to a large agrarian population on climate, pest, seeds, market, market price etc. DAC had challenge to disseminate information at a short notice. It had multiple delivery channels for citizen centric services namely Kissan Vigyan Kendra, Kisan Call Centres, Citizen Service Centres, etc through which it is disseminating information.

In view of larger mobile user base across India, DAC decided to use mobile as a platform for reaching out to the farmers in a quicker way. Information dissemination services may be delivered through multiple mobile channels. DAC is extensively using Mobile Seva platforms for communication between Department and farmers and started sending various alerts and market information to farmers via mobile on real time basis. Farmers and other stakeholders can query about agricultural problems, crop information, weather information, commodity prices to DAC and answers from concerned specialists and officials were sent to the farmers through this service.

Table: Year-wise transaction volumes for various services

Name of Service	2015-2016	2014-2015	2013-14	As On Date
Department Integrated	558	663	487	2500+
SMS	4785938144	2399730580	691171408	1026 Cr +
Pull SMS	3049466	3031352	1528037	641+ Services
IVRS	2730442	361424	2297	2544201
Mobile Application	293	171	285	975 +

Implementation coverage

National level   -   36 Number of State covered
State/UT level   -   670 Number of District covered
District level   - 7000 Number of Blocks covered

- Develop an ecosystem of smart e-governance comprising of:
    - Mobile based authentication
    - Location based applications
    - Indian language apps
- PKI based communication though mobile devices
- Outbound Dialler (OBD) Service.
- Billing Infrastructure
- Keyboard for Indian languages
- VoIP & SIP Platform

Outcomes in terms of Efficiency, Improvements and integration
Using Mobile Seva departments are providing their services through websites and different channels in the form of SMS, IVRS, Mobile applications to their citizens/users. A centralized Mobile Seva platform has been created which can be utilized by various government departments can use without investing heavily on creating a separate infrastructure thus saving time and money. Government departments, users/citizens save the time. These services help to improve the aggressiveness of business environment to create smart customers helping businesses save time, money and energy.

Specific innovative ideas implemented
A centralized Mobile Seva platform has been created which can be utilized by various government departments can use without investing heavily on creating a separate infrastructure thus saving time and money. The services are offered over cloud and with changes to their existing system various government departments can start offering their services over mobile based channels.

Extent of integration
"Mobile Seva" act as a one-stop solution for various central and state Government Departments and agencies across the nation in providing all their mobile service delivery needs. IT centrally hosted cloud based mobile enablement (m-enablement) and mobile based delivery (m-delivery) infrastructure and platform that enable all Government departments and agencies to offering their services through mobile phones without having to invest heavily in creating their own respective mobile platforms.

In the country, Government departments and agencies at central and state levels touch over 1.2 billion citizens in their day to day lives. The "Mobile Seva" bring all these government departments and agencies at central, state, and local levels on to this common platform and reach over 900 million mobile subscribers (80 % of country population) with public services. Mobile Seva enables integration of mobile applications with the common e-governance infrastructure for delivery of public services to the users. Already over 2540+ Government departments and agencies across the country have integrated their services with this platform (with more than 1026+ crore PUSH SMS transactions flowing across).On SMS over 634+ services have already been operational. Over 25 lakh and 7 lakh transactions have been done thorough IVRS and USSD integration respectively. Mobile Applications Store (AppStore) hosted 837+ live and fully integrated mobile apps. These applications are for various government services and social cause. Over 10 lakh citizens have downloaded these apps. A Mobile Payment Gateway has also been created, which allows citizens to make electronic payments for various services through mobile phones.

ENABLER INDICATORS
Process reengineering
The prime motivator for this initiative was the realization that massive and growing penetration of mobile phones in India can substantially enhance access to electronic services, especially in rural areas. In India, the sparseness of landlines and absence

of broadband, particularly in rural areas, coupled with the relatively high cost of PCs, has kept Internet usage very low. Mobiles are fast bridging the digital divide, and have become the most convenient channel for people to access information and communication technologies (ICT) based services for work, education and leisure. This emergent scenario provides a ready and widespread base for access to and delivery of public services electronically, hence contributing significantly to the cause of e-governance across the nation. This initiative was that its implementation complemented efforts to realize the vision of the National e-Governance Plan to bring public services closer home to citizens at affordable costs. In the country, Government departments and agencies at central and state levels touch over 1.2 billion citizens in their day to day lives. Implementation of Mobile Seva is helping to bring all these government departments and agencies at central, state, and local levels on to this common platform and reach over 900 million mobile subscribers in the country with public services, again contributing to the national e-governance movement.

Mobile Seva provides a one-stop solution to all the central and state Government departments and agencies across the nation for all their mobile service delivery needs. It provides a centrally hosted cloud based mobile enablement (m-enablement) and mobile based delivery (m-delivery) infrastructure and platform that allow all Government departments and agencies to expeditiously start offering their services through mobile phones without having to invest heavily in creating their own separate mobile platforms

Challenges faced in implementing Process changes
- Low cost access to electronic public services, especially in rural areas
- No institutional and policy driver for mobile-enablement
- High investment requirements for departments for m-enablement
- Lack of capacity and skilled personnel
- No convenience of a single number
- No "single window" solution
- Integration with multiple telecommunication companies.
- Cross platform support.
- Convincing departments to use Mobile Seva as Single Mobile Platform
- Multi-lingual support– India has 22 Official Languages.

The Lessons learnt from the Process re-engineering exercise
- Responsibility needs to be shared by the team.
- Training in required technologies is must.
- Executive support is critical.
- Choosing the right tools required for project.

Best practices adopted from the industry/ other State implementations
We studied practices followed by other countries. Mobile Seva team visited South Korea to study the practices they are following to provide services through mobile channels.

Leadership, Change Management, Capacity Building during transition
The entire initiative is owned, funded and implemented by MeitY. The initiative has received full support of the Ministry of Communications and IT and the Prime Minister's Committee on National e-Governance Plan (NeGP). The PM's Committee on NeGP in its second meeting on 1st July 2013 directed all ministries and departments both at the central and state levels to integrate their services with the Mobile Seva platform for delivery through mobile devices.

Leadership support for the initiative
Driven by the vision of providing public services to all the residents in the country, especially in the rural areas by utilizing the reach of mobile phones and the innovative potential of mobile applications, Ministry of Electronics and Information Technology (MeitY), Government of India, took up the initiative of baselining the current scenario regarding mobile-governance and also formulating a comprehensive policy framework on the same to make government services available to the residents of the country through mobile devices. In this regard, a Draft Consultation Paper on Mobile Governance Policy Framework was prepared by the National e-Governance Division (NeGD) within MeitY) in March 2011, and circulated and also made available online for feedback and comments from stakeholders across Government departments, industry, civil society and citizens.

Multiple rounds of consultation were held. Part of these consultations was a written consultation, which started with the publication of the draft consultation paper on mobile governance framework on the website of MeitY) in April 2011. Interested parties were invited to respond to the consultation paper and to the questions included in it. In addition, face to face consultations were held with various stakeholder groups such as telecom players, industry associations, telecom equipment providers, IT and VAS industry representatives and civil society organizations. It emerged from the consultation process that the mobile platform was ideally suited for increasing access to and widening the reach of public services in view of the very high penetration of mobile phones in the country, particularly in the rural areas. It was also recognized that a wide range of services offered by Government departments at both central and state levels could be mobile enabled and offered through mobile devices. Services such as status tracking of applications submitted, notifications for receipt of applications and delivery of services, and complete end to end services through intuitive mobile applications were specifically identified for delivery through mobile devices. After holding several rounds of detailed consultations with all the stakeholders, the final Framework on Mobile Governance was notified by MeitY in Feb. 2012.

Change management and Capacity building
We spread awareness across centre and state governments, which have resulted in integration of more than 2550+ departments. We have imparted hands on training to various officials from beneficiary departments to use the Mobile Seva platform, mobile applications, and how to use various services provided by the Mobile Seva platfrom.

Project management & Monitoring

The key activities of the project are tracked, reviewed, and revised at regular intervals to ensure the desired results are delivered. The benefit of this process is that risks to project setbacks or failure are minimized.

Regularly assessing progress related to scope, timeline, and budget helps to minimize the impact of setbacks as the project progresses. By capturing and assessing progress, proper evaluation of variance to plan can be conducted and corrective actions implemented. Additionally, as the Meity/PM or lead is thoroughly capturing progress and any missed activity dates, adjustments and tradeoffs between schedule and budget goals can be analyzed and agreed upon.

Financial model adopted

Financial sustainability: The entire project is being funded by MeitY. At present, the Push SMS services and mobile app development and hosting is being done free of cost for Government departments and agencies. For Pull SMSs, citizens pay normal charges to the telecom service provider. A revenue model is being evolved based on the platform's service offerings and capabilities and shall be put in place before the end of the current funding in 2017.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Narsee Monjee Institute of Management Studies (NMIMS), Mumbai was entrusted by C-DAC to conduct an unbiased third party assessment into the effectiveness and impact of this initiative. The objective of the study is two-fold:

- Establish key performance indicators to gauge efficiency of Mobile Seva initiative, and solicit response on these KPIs from the end-consumers of the service
- Assess the impact of the service on stakeholders and identify gaps between perceived and actual benefits. The research methodology was a mix of qualitative and quantitative research methods. The qualitative methods ere used to explain and interpret our findings from the quantitative analysis of data points in a survey.

The quantitative research used a formalized and unconcealed questionnaire with close ended questions (Dichotomous, Multiple Responses, and Scale Based). Data were collected through means of survey administered via email or telephone, depending on convenience of the respondent. Key performance indicators were identified to measure the effectiveness of Mobile Seva initiative. These KPIs were measured using 4-point scale, percentage of responses, and correlation. The qualitative research used in-depth interview conducted over telephonic medium. The interview form was semi-structured with open ended questions. Data collection was interactive and used an unstructured approach. To analyze the qualitative response received, we mapped every answer to a theme and identified the tone of the respondent as positive or negative based on keywords being spoken for every question type. This technique is derived from the moodsense algorithm used by Twitter and other noteworthy analytics engines such as Google. The subjective feedback received was further categorized under broad impact assessment

parameters (with some feedback being repeated across categories due to its qualitative nature) to help identify a generalized insight and recommendation.

Challenges faced in transition
Challenges faced in below areas

- Seek stakeholder ideas and support
- Update them on the process
- Hear about any issues
- Brainstorm workshops.

Throughout the process of developing the plan, ensure that all stakeholders are aware of the progress and that there are mechanisms for them to clarify any areas and have input into the development of the plan.

The Lessons learnt from Change Management and Capacity building
Mobile Seva project enables the departments to function in parallel with the legacy system. The SMS, USSD, IVRS, Mobile applications, payment gateway extend its reach and provide convenience to the citizens. The departments can work with the existing/ legacy mode of operations. Mobile Seva provides an additional arm with larger reach. For example, through Mobile Seva SMS Gateway, Ministry of Agriculture start sending SMSs to farmers containing information about weather, farming, various social schemes, etc. We spread awareness across centre and state government, resulting integration of more than 2540+ departments. Our team gives hands on training to various beneficiary departments to use the new system, mobile Applications, capability of the mobile seva delivery gateway. Using mobile applications developed for departments give awareness to go with the changing technology.

Technology
Mobile Seva platform is developed upon open standard using open source software tools. Different technologies used in the development of Mobile Seva platform are:

- Java
- JSP Servlet
- JBOSS application server
- Postgresql
- Struts
- Spring
- Kannel –SMS Gateway
- Asterisk –IVRS Gateway
- OsTicket -Ticket System
- Nagios - Monitors Tool
- Mobicents Communication Platform

VALUE INDICATORS
Digital Inclusion
Mobile Seva provides the ability to individuals/citizens and departments to access and use information and communication technologies. Mobile Seva target people without having internet access like rural area citizens where they can get access and utilize the Mobile Seva platform to get their services related information immediately. Mobile Seva platform provides full support for all Indian languages. It has developed Indian language keyboards for mobile devices in 11 Indian languages. The mobile apps for these keyboards have been hosted on the Mobile Seva AppStore. The services on the SMS channel have been made available in 11

Indian languages. IVRS inbound service is available in English and Hindi. IVRS outbound call service is available in all local language languages.

Green e-Governance

Before Mobile Seva and before electronic service delivery, the communication between customer/citizen and government departments happened through direct interaction between both parties and lot of paper work needs to done. Citizens/users have to visit the government departments frequently to get the status of their ticket. It consumes citizens' valuable time and natural resources in terms of fuel.

Departments have to maintain files and records at their end. Keeping them safe from external hazards and maintaining them for long time is another challenging task for the departments. In any case if department miss the physical files chances of loosing important citizen related data were very high.

Mobile Seva removed all these bottlenecks by providing their services to departments and citizens through websites and various channels to communicate both parties to seamless and smooth functioning of their services. Now departments become paperless in providing their services to citizens regarding their ticket status. Mobile Seva has brought service at the hands of the citizens. Now Citizens no need to fill any forms to get their ticket status/information. Simply they can use their handsets to send SMS and get the status instantly. There are lot of mobile apps developed by Mobile Seva which are uploaded to Mobile Seva AppStore helps to eliminating paper waste, a mobile app can be a more efficient way to communicate important information by paperless.

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One Stop Clearance System @Invest Punjab
Department of Investment Promotion, Government of Punjab

Anirudh Tewari and Krunesh Garg

PROJECT OVERVIEW

One Stop Clearance System (OSCS) is a common platform developed for the investor to obtain Regulatory Clearances as well as Fiscal Incentive Approvals of various state departments through Punjab Bureau of Investment Promotion (InvestPunjab). OSCS ensures world class facilitation to the investors, right from conceptualization of the project till commencement of commercial operations that includes Project Acceptance, Site Clearances (LORC-I), Construction Permits (LORC-II) and Operational Clearances (LORC-III).OSCS is beneficial for all domestic and international prospective entrepreneurs who consider Punjab as their preferred investment/business destination. Further this system provides regulatory clearances to investors with respect to all sectors with Fixed Capital Investment of Rs. 1 Cr. and above. OSCS also helps the investor in getting incentives as per the State Incentive Policy called FIIP {R} 2013, at present these incentives are available for sectors such as Manufacturing, Textiles, Agro& Food Processing, IT/ITes & ESDM, Tourism and Healthcare. World Bank has ranked State of Punjab as no. 1 in "Ease of Setting Up a Business" in its Assessment of State Implementation of Business Reforms Survey, Report released in September 2015. This successful model has been applauded by Parliament Committee, Cabinet Secretariat and states like Andhra Pradesh, Tamil Nadu, Rajasthan, Haryana, Orissa, Chandigarh, Madhya Pradesh and Bihar. By moving one step further state of Haryana is replicating same system for their Haryana Enterprise Promotion Board under InvestHaryana umbrella.

The benefits to the stakeholders are:
- Know your clearances before start of the project
- Online project submission through CAF (Common Application Form)
- One time document submission along with CAF
- Pre-feasibility in 10 days without any fee
- SeVA (Self Validated Approval) within 24 hours
- Advisory at the start of each stage
- Multiple statutory payments in one go through Online Payment Gateway
- Paperless filling
- Online processing
- Single level of approval, CEO InvestPunjab
- Single point of contact (Desk Officer)
- Deemed Approval to reduce delays.
- Stages and timeline defined (Stage I, II, III, IV)
- Pre-cleared industrial sites
- Graphical Reports & MIS
- Online Business Query Interface
- Land Bank Information
- Real time status tracking through SMS, Email & InvestPunjab Mobile App
- Inter-department communication mechanism

The key learnings are as follows:

- Standardization to reduce system redundancies
- Governance reforms by enhancing transparency and timely approvals
- Business process re-engineering to facilitate the targeted population
- Person wise mapping of required activities, regular follow-up and targeted milestones for enhancing the efficiency
- System enabled task alerts to enhance acceptability, efficiency and productivity

RESULT INDICATORS

InvestPunjab has been setup by the Government of Punjab through notification no. PBIP Notification No. 7/17/13ASI/1998 for providing required regulatory clearances and fiscal approvals for setting up industry with in state of Punjab. InvestPunjab is consisting of 23 departments/agenciessitting under one roof with single approving authority CEO, InvestPunjab.

Key Performance

- One Stop Clearance System provides a unique interactive platform where investor and officials work as per their mutual requirements. Like if investor has any query, investor can get immediate response by sending query online through OSCS. For the facilitation of investor lank bank and master plan layouts have been made available at InvestPunjabweb-portal. Overall OSCS provides world class facilitation to the investor right from conceptualization of the project till commencement of commercial operations.
- As on date One Stop Clearance System has processed more than 200 projects with proposed investment of approximately Rs. 14,000 Cr. in just a period of 19 months.

Online (One Stop Clearance System) Vs Offline
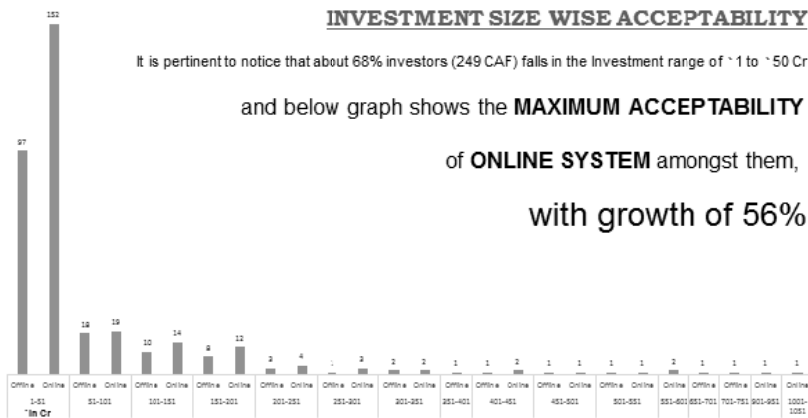
Figure: Instrument size wise maximum acceptability

Implementation coverage
- Know your clearances before start of the project
- One Stop Clearance System is a workflow based web application for investor facilitation right from conceptualization of the project till commencement of its commercial operations that includes Project Acceptance, Site Clearances (LORC-I), Construction Permits (LORC-II) and Operational Clearances (LORC-III). One Stop Clearance System provides regulatory clearances to all sector investors with Fixed Capital Investment of Rs. 1 Cr. and above. As per the State Incentive Policy called FIIP {R} 2013, there are incentives available for sectors such as Manufacturing, Textile, Agro& Food Processing, IT/ITes& ESDM, Tourism & Healthcare.
- InvestPunjab has added new SeVA (Self Validation Approval) on 26 August 2016 which wasinaugurated by Hon'ble Deputy Chief Minister of Punjab. Using this service an investor can have approval in just 24 hours.
- Availability of Business Query Interface
- Availability of Land Bank and master plan layout for industry
- Departmental notifications, Regulatory Forms with fee details
- Sectoral Information
- Third party validations

Outcomes in terms of Efficiency, Improvements and integration
One Stop Clearance System has been designed & developed jointly by InvestPunjab and NIC Punjab with minimal cost as both are government departments working without profit and loss. Even there is no additional cost involved in implementation of the project as already working manpower was trained to work on OSCS. This online system allows paperless working within office and allows easy communication flow between members, which results in reduction of administrative and other office expenditures. Also provides easy interface between investor and this office, which further reduces search cost, delay cost and interest cost of investor. With minimal cost involvement maximum investment attracted within short time span.Innovative ideas implemented in e-Gov area
- 23 departments working under single roof
- Common Application Form (CAF) catering needs of multiple departments
- One time document submission
- Receiving multiple statutory payments in one go through online payment gateway
- Free of cost Project feasibility check in 10 days
- SeVA (Self Validated Approval) within 24 hours
- Single point of contact (Desk Officer)
- Real time SMS and Email alerts
- Advisories at the start of each stage
- Pre-cleared industrial sites
- Deemed Approvals
- Paperless processing
- Fixed timelines for each clearance
- Graphical MIS dashboard for Management

- Inter-department communication facility through web application
- Online business query interface.

ENABLER INDICATORS
Process reengineering
After complete Business Process Re-engineering, InvestPunjab has divided various clearances into following stage:

Table: Stages of Clearance

Sl. No.	Stage	Forms Involved	Outcome
1.	Stage I	Common Application Form (CAF)	Accepted In Principle
2.	Stage II	CLU, CTE, Temporary Power Connection, Forest NOC	LORC-I (Site Clearance)
3.	Stage III	Building Plan Approval, Contract Labour License, Boiler Erection Perittmission, Provisional Fire NOC	LORC-II (Before Construction)
4.	Stage IV	CTO, Factory Registration, Regular Power, Electrical Equipment Approval, Fire NOC, Shop Registration, Boiler Registration, Stability Certificate, Water & Sewerage Connection, Final Fire NOC	LORC-III (Before Commissioning of Project)
5	Stage V	Fiscal Application Form (Investor's Proposal)	Fiscal Incentive Approval

Stage I is consisting of One Time Online Registration, filling and submission of CAF and issuance of Accepted in Principle intimation to investor.*Stage II* onwards, process starts with the filling & submission of prefilled forms (data fetched from CAF) as mentioned in Forms Involved column and ends with Outcome column as shown in table given above.All stages are enabled with the provision of Online Payment of various applicable statutory fees.

In the process of issuance of clearance whenever an action is required from any stakeholder i.e. investor/officer OSCS will alert the stakeholders with Email and SMS. In addition to that every day OSCS is sending alerts to every user regarding his/her pendency.

Challenges faced in implementing Process changes
InvestPunjab is consisting of 23 departments/agencies, for getting all department/ agencies in sync was a challenge. For that numerous presentations and discussions where conducted. Various acts, rules, notifications and guidelines have been studied for getting all departments/agencies on board. During this exercise focused effort was made to identify parallel and serial set of activities involved at various levels. Following are the challenges faced:

- Bringing 23 departments/agencies under one umbrella

- Development Common Application Form (CAF), so that it satisfies needs of each and every department
- Setting clearances timelines to understand the paradigm of the regulatory regime applicability and process re-engineering
- Fee and its distributions so that department can take all in one go
- Grant of approvals in fixed timelines

The Lessons learnt from the Process re-engineering exercise
- Standardization to reduce system redundancies
- Business process re-engineering is required to facilitate the targeted population
- Governance reform by enhancing transparency and timely approvals
- Seamless inter and intra communication between all stakeholders
- Regular follow-up and targeted milestones have enhanced the efficiency

Best practices adopted from the industry/ other State implementations
One Stop Clearance System is an innovative idea of InvestPunjab. This successful model has been applauded by Parliament Committee, Cabinet Secretariat and states like Andhra Pradesh, Tamil Nadu, Rajasthan, Haryana, Orissa, Chandigarh, Madhya Pradesh and Bihar.

Leadership, Change Management,Capacity Building during transition
One Stop Clearance System has been developed under the dynamic leadership of Mr. AnirudhTewari, IAS, CEO cum Principal Secretary Industry & Commerce, Punjab and Mr. D. K. Tiwari, IAS, Additional CEO. OSCS has become role model for Single Window Clearance System (Industries) for all the states in India. Various have visited Punjab Bureau of Investment Promotion and shown keen interest in replicating the OSCS in their states to increase efficiency, transparency and productivity in industrial sector. By moving one step further state of Haryana is replicating same system for their Haryana Enterprise Promotion Board under InvestHaryana umbrella. NIC Punjab and InvestPunjab are helping them in modifying the system as per their requirements.

Change management and Capacity building strategy
In offline system in 2014, InvestPunjab has received 139 applications of proposed investment of Rs. 9,650.50 Cr. After implementation of One Stop Clearance System, the InvestPunjab has received & processed more than 214 projects with proposed investment of approximately Rs. 14,573.69 Cr. in just a period of 19 months. In the all the benchmark calculators whether it's Investment Size wise, Sector wise or district wise, the new system is way ahead from earlier.
After development OSCS, NIC Punjab in collaboration with InvestPunjab has organized various trainings and handholding session for capacity building. In training along with live demo users were provided with manuals. The manuals and video tutorials are available online on the portal for any time reference.

Project management & Monitoring
At InvestPunjab there is a review meeting on every Monday. One Stop Clearance System provides a comprehensive MIS report of all the departments for the meeting.

Financial model adopted

One Stop Clearance System has been designed & developed jointly by InvestPunjab and NIC Punjab with minimal cost as two government departments are involved who are working without profit and loss. The funds were provided by Government of Punjab. With minimal cost involvement maximum investment attracted within short time span.

Challenges faced in transition mainly from Change Management & Capacity building

InvestPunjab has been setup by the Government of Punjab for providing required regulatory clearance and fiscal approval for setting up industry with in state of Punjab. InvestPunjab is consisting of 23 departments/agencies, for getting all departments/agencies in sync was a challenge. Various acts, rules, notifications and guidelines have been studied for getting all departments/agencies onboard.

The Lessons learnt from Change Management and Capacity building
- Person wise mapping of required activities
- System enabled task alerts to enhance acceptability, efficiency and productivity
- Seamless inter and intra communication between all stake holders
- System allows more visibility to officers to process applications
- Regular follow-up and targeted milestones have enhanced the efficiency
- Activities can be easily measured, monitor and control

Technology

Technological solution adopted

One Stop Clearance System has been developed and maintained by NIC Punjab using following Open Source Technologies:

- ASP MVC 5
- AngularJS
- JQ query
- Bootstrap
- CK editor
- Light Box
- File Upload Plugin
- Nivo Slider
- News Ticker
- FlotGraph

Strategy for Disaster Recovery and service continuity

OSCS is deployed using secure NIC Cloud services and it has full proof disaster recovery plan. One Stop Clearance System tries to achieve cent percent service continuity.

Impact and value-addition thru adaption of Social media

NIC Punjab and InvestPunjab have created video tutorials for investors and officials. The video tutorials are available on InvestPunjab channel at YouTube.

The Lessons learnt from Technology choices and implementation strategy
- Must enables the full control over the rendered HTML
- Provides clean separation of concerns (SoC).
- Enables Test Driven Development (TDD).

- Easy integration with JavaScript frameworks.
- Following the design of stateless nature of the web.
- RESTful urls that enables Search Engine Optimization (SEO)
- No ViewState and PostBack events.

VALUE INDICATORS
Digital Inclusion

For digital inclusion of all the stakeholders, InvestPunjab and NIC Punjab have consulted them in development and implementation phase of One Stop Clearance System. There are two major categories, one is officials (i.e. 23 departments/ agencies) and other is prospective entrepreneurs. For inclusiveness of all the stakeholders InvestPunjab has performed following tasks:

- Regular workshops for investors and officials
- PDF & Video tutorials are available on InvestPunjab web portal for anytime reference.
- Conducted hands on trainings and handholding sessions for all the stakeholders
- InvestPunjab has Person wise mapping of required activities
- Single point of contact (Desk Officer)

Green e-Governance

- One Stop Clearance System is an online application. Hence allows paperless working with in office and allows easy communication flow between members.
- For One Stop Clearance System, InvestPunjab has not purchase any servers. The application is deployed using NIC Cloud services for reducing e-Waste.

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Electronic Project Proposal Management System
Science and Engineering Research Board (SERB)
Department of Science and Technology, Government of India

Brakaspathy, V. K. Sharma and Paras Nath Barwal

PROJECT OVERVIEW

Electronic Project Proposal Management System (e-PPMS) is a web-based system that encompasses the complete life-cycle of funding of R&D projects, beginning with online submission of project proposals for funds, to monitoring and management of funded projects. e-PPMS is intended towards making the entire process of funding R&D projects paperless and bring in the much needed transparency in the system. Efforts are towards providing easy access to information and statistical analysis/results on all the projects funded by the various departments of organization. The project aims at providing service to the citizen in terms of ease in applying for research. Through in-built communication models and easy tracking of the proposal status, the project will provide researchers timely updates on their application and will reduce undue time delays. Also, the project will help to keep the intellectual property rights of the citizens secured by allowing only authorized people to view the proposal details. It also increase the outreach and recognition of the organizations. Before this initiative, all the research funding through the government agencies was done manually. It had severe drawbacks that hampered the quality and quantity of research going on in the country, a few listed below:

- Inconsistency of Research Data: Manual system was prone to human error, which could lead to inconsistency in the data recorded.
- Transparency in Funding: Research funding should be a transparent process. Favoritism and duplicate funding were a few of the reasons that the manual system was compromised. There was no way to monitor the complete process of funding as there were individual decisions at various steps that were unaccounted.
- Data Loss and Natural Hazards: Offline system was prone to natural disasters which could lead to server loss of important data. There was way to recover the lost data.
- Security and Integrity of Research: Offline system could not safeguard the integrity of the research being proposed or carried out. It was prone to plagiarism and the data was vulnerable to all sorts of theft.
- Paper based system: The file submitted for research, on an average, consisted of over 50-60 pages per proposal. This was one of the major reasons to move to an online system as it accounted to the loss of huge amount of natural resources.
- Lack of Consolidated Reports: Due to offline mechanism, there was no way to obtain understandable and accurate reports from the data that was captured. As it was humanly impossible to analyze terabytes of data to obtain relevant information.

There were many challenges in terms of implementation strategy and infrastructure that were identified in order to overcome the drawbacks mentioned above. A few of those challenges are listed below:

- *Generic System*: The design of the system shall be generic enough that it should accommodate infinite changes and should cater all processes and requests, for the near future, by the organization.
- *Database*: In order to make a comprehensive system, it needs to have the complete database of all research institutions from the country, the data of all cities/districts/states and all the experts who may act as a potential expert for a research domain were also to be identified.
- *Registration of users*: Identified experts of various domains and sub domains and internal members of the organization along with eminent personalities who were to be a part of the system shall be mapped and registered in the system automatically by the administrator.
- *Scalable system*: The system is expected to cater requests of the order of 10,000 and above proposals per year per scheme. It should be accessible at all times to the end user and should have a fail proof strategy for the recovery of the data being captured.

In SERB, we implemented e-PPMS as a pilot project for their one Major Scheme only (Extra mural Research Funding Scheme). The System was launched by Hon'ble Minister on 31st January, 2014.Before implementation as pilot project, we planned for soliciting feedbacks from stakeholders, tracking the activities and outcomes and recording any adjustments we made in the system to get the desired results which helped us in the following manners:

- It reduced the risk of an unsuccessful organization wide implementation of e-PPMS.
- It enabled the SERB officials to determine if this system was the appropriate solution to their workflow or not.
- This helped in learning what went well and what didn't for Extra mural Research Funding scheme before full-scale implementation.
- This also helped us in building user (SERB officials) awareness which was important and helpful for a successful full-scale implementation for other schemes.

To the stakeholders it has come fruitful in many ways, E-PPMS has not only increased the ease of access to the end users but it has also enhanced the capability for the internal users to communicate with the end users. It has inbuilt channels for communication e.g. communication module which utilizes both email and mobile based communication. As a result of this, the whole process has moved from a bulky set of paper file to some kilobyte of data which contains all the detailed information including the complete proposal, communication pertaining to the proposal and its proceedings etc. Earlier researchers, who applied to various fields for research, had to travel or communicate with the concerned department for any query or addendum. Online system has got this ease of keeping a track of every change. System is accessible from any place in the world that has access to internet. This provides the end users with the flexibility to access their data any moment. This has not only enhanced the quantity of the research proposals submitted but also the quality of the proposals submitted has improved. As the amount of time for constructing the proposal content has increased in contrast of the time required for submitting the proposal offline. The online system is far more effective than the offline system. In terms of services provided, it has covered all aspects of the

offline system and has grown further beyond that. Online system is not only capable of all the offline processes like the submission of a research proposal, its evaluation by the internal members, online meeting decisions, release of funds and the monitoring post approval but it also covers the more broader aspect of analyzing the type of research going on in the country. The system can generate different types of reports on the go based on different parameters like the research domain, demographics and the investigator qualifications etc. It covers every characteristic possible from the system that can be incorporated to identify the status of research in the country.

RESULT INDICATORS
Benefits to SERB
- It has made the entire process paperless and has aided easy dissemination of project information, including the review comments on proposals.
- e- PPMS has brought in the much needed transparency. PI can get the status of proposals via SMS using PUSH/PULL services.
- It has enabled organizations to get MIS Reports and perform Statistical analysis on the proposal data and helped in streamlining the project monitoring process.
- e- PPMS secures the data and there is no loss of information which was seen in the pre-deployment scenario due to proposals getting lost, or proposal files getting torn with passage of time.
- e- PPMS has reduced the processing time of proposals.
- Using search engine of e-PPMS duplicate proposals can now be easily tracked to void duplicate funding.

To Citizen
- The PI finds it very easy to submit project proposals from anywhere through online submission.
- Automatic alerts and reminders (email and SMS) keep PIs updated with their proposal status and next action.
- e-PPMS gives the PIs a platform to track the status of their proposals easily via SMS and e-mail.
- PI can now get real time status of his proposal even without having the internet connectivity. e- PPMS is integrated with the **MobileSeva** of Government of India for PUSH and PULL SMS services.

Key Performance
- **G2C:** The project aims at providing service to the citizen in terms of ease in applying for research. The statistics have shown that the government organizations that have adopted the e-PPMS have increased number of applications every year and also have a higher rate of processing applications and in release of funds. Our feedbacks have been outstanding in all the organizations where the citizens themselves provided the benefits of using e-PPMS. It has not only aided the citizens to help apply for research grants, but also provided a consolidated means of archival for the organizations, where they have access to thousands of files on a single click. It is secure, versatile and easy to use.

As a result of successful implementation this, project is being successfully deployed in 4 other research organizations apart from SERB. In SERB itself, the volume of data processed is very high. The total number of registered users being 38,356 out of which 21,108 have registered in the last year itself. Total number of proposals submitted is 18473 out of which 8199 were submitted in the last year. Total number of Sanction issued is2142 out of which 1780 are from the previous year. Total reviews being done online are 17395 out which 10357 were from the last year. This data show that since e-PPMS was launched in January 2014 to now September, 2016 the usage of system has increased significantly by the stakeholders. This data is a proof of the following service outcomes about e-PPMS that:

- It has made the entire process paperless and has aided easy dissemination of project information, including the review comments on proposals.
- e- PPMS has reduced the processing time of proposals.
- Using search engine of e-PPMS duplicate proposals can now be easily tracked to void duplicate funding.
- e-PPMS has increased the number of Proposals.
- Increased outreach.

Table: Year-wise transaction volumes

Sl. No.	Service Type	2013-14	2014-15	2015-16	2016-17
1.	Users Registered	3127	6493	17469	11267
2.	Proposal Submitted	92	3461	9041	5879
3.	Online Meetings	1	18	62	56
4.	Online Reviews	64	1673	9605	6053
5.	Proposals Sanctioned	0	0	1267	875
6.	Ongoing Projects	0	0	0	1419
7.	Schemes added	1	1	4	3

Implementation coverage

e-PPMS is web based application covering 29 states of India and hosted in the Cloud environment which can be accessed from anywhere. It has a responsive GUI which makes it compatible with almost all handheld devices like Mobile, tablets and laptops. There is no need to travel to any access point to access the system. It can be used while sitting in the home or travelling in the bus or train on your mobile phone. New services added:

- *Feedback:* e-PPMS is equipped with a Feedback module, where the user is allowed to provide feedback for the process they register for in the system. For example, an Investigator can submit a feedback on the proposal submission process, where they can rate each sub-process on various pre-defined parameters on a scale of 1-5.
- *Grievance Redressal:* We have a problem reporting module, where the user can report any problem they face while interacting with the system. Being a single step process it hardly take seconds to report any problem. The screenshot of the error is automatically captured along with the request. This request is then given a ticket number. Administrator responds

for the ticket after the issue has been resolved. We also have a helpline number and a support email address for the user to send their issues.

- Integration of Google Analytics for real time views of system in terms of number of users connected region wise and mode of access (Type of device and browser).
- Social Media Integration: for promoting the web application.
- Enhanced Full text search to avoid plagiarism.

Outcomes in terms of Efficiency, Improvements and integration

e-PPMS has reduced the effort time and cost for the users as:

Effort

- Access to all the necessary information at one place.
- Ease of application to the applicant due to the simple design and the tutorials provided within the application
- Reduction in the amount of paperwork that was needed for a physical application.
- Easy access to all the proposals to the evaluator and single click evaluation process, reducing the effort in evaluation and scrutiny.

Time

- The time for submitting an application has been reduced to minutes, where it used to take days to gather necessary details for the physical copy.
- Evaluation time is also reduced significantly comparing to its counterpart where it took months for a proposal to get funded.

Cost

- For the investigator the cost of producing paper copies of about 100 pages and posting them is reduced to zero.
- For the SERB, reduction in duplicate funding and avoiding plagiarism as resulted in providing quality research get funded. It has also prevented favoritism and partiality thus increasing the overall quality while reducing the cost.

We categorize innovations into different categories that make e-PPMS a one of a kind system.

- It can automate the manual process of any organization that supports research funding. It's *a workflow based system*, and the workflow can be configured as per any requirement. Its modular design enables us to configure different modules for any organization and is open to infinite changes in each module without affecting the performance of other schemes.
- It not only enables *transparency in the system* but also provides real-time tracking of the proposal. The system is coupled with Lucene based full-text search which is used to search keywords, phrases or fuzzy text from anywhere in the system. It is indexed, which makes it faster and more efficient. Since, e-PPMS ensures a centralized database for all research organizations; it provides an efficient mechanism to avoid duplicate funding of same or similar research in different research organizations.

- It is enabled with latest *cutting edge technologies* which makes it versatile and usable in all scenarios. e-PPMS is built upon the Java technology and utilizes a Spring and Hibernate based framework, this not only provides features like various modules of Spring (security, MVC, AOP etc.), Easy usage with object relationship mapping with Hibernate and the open source yet powerful database of PostgreSQL makes it a complete pack of technologies.
- It is *accessible* to all from anywhere in the world. The main motive of enable an online e-PPMS system instead of the manual process was to make it accessible to everyone in the country. e-PPMS can be accessed by anyone with very basic infrastructure requirements of internet connection. It can be accessed from any device, be it a desktop, laptop or a mobile device. It supports all latest browsers and operating systems.
- The system is capable of generating *dynamic reports*, for in-depth analysis and insights on the type of research going on in the country, in the form of pictorial or graphical representation. Various permutations are available to capture data in the form of these reports.
- E-PPMS has incorporated Mobile Seva service from MGOV, for which SLAs have been signed. They're documented in the SVN repository along-with other project related documents like initiation, MOUs etc.

ENABLER INDICATORS
Process reengineering
- Elimination of Hardcopy document: The first process that needed to be re-engineered was to eliminate the need of paper for submitting a proposal online.
- Changing the application format: The application format needed to be re-engineered as the one that was used for offline system had redundancy of information in terms of the institute details, investigator details and the information captured in the project proposal itself.
- Removal of signed copy approval: Approval from Chairman in the meetings and approval of the Secretary had to be done online, which required exclusion of the requirement of having a signed copy approval as implementing digital signature was out of the scope of the project at the initial stage.
- Project Start Date process: Start date of the proposal was decided by the acknowledgement of investigator that he/she has received the released money. This process itself took months and it has been re-engineered to automatically capture the date of the released money from the system.

Challenges faced in implementing Process changes:
- Stakeholder acceptance: First and foremost challenge was to get the acceptance from the stakeholders to re-engineer the complete offline process to a paperless online system. It was a challenging task to introduce a complete paperless system.

- Changing the structure of the file number caused commotion in the whole organization as it used to be a familiar identifier for a file in the offline system.

The Lesson Learnt from the Process re-engineering exercise:
- There needs to be a clear mode of communication between the implementing organization and organization for which the project is implemented. This can be taken care of by conducting regular meetings with the client, organizing workshops and training sessions and getting cooperation from the higher authorities in making strict decisions.
- The system should be extremely user friendly and self-indicative to be used by an audience that is naïve to the system.

e-PPMS comes with an interface that is built up on a fully responsive framework, which enables it to be accessed from all devices and operating systems. It encompasses all security measures required to make it a safe application and is coupled with different inbuilt features like feedback and grievance redressal mechanism. These are some of the best practices that each of the e-governance initiative should have to make them more usable by the end users.

Leadership, Change Management, Capacity Building
This project has been a success story only under the Leadership of Dr. Brakaspathy (Secretary, SERB). His constant involvement from the scratch in moving the offline system to online was the decisive factor in taking the e-PPMS to the standards it has reached now. He constituted a committee that is responsible for constant updates and revisions in the online system so as to keep it up to the mark at all times. This committee is the nodal point of contact for building or updating any e-PPMS related task.

Change management and Capacity building strategy
- Imparted various training sessions to the stakeholders.
- Preparation of Sophisticated and detailed Role wise user manuals for all modules.
- Conduction of various time-to-time workshops for hand holding sessions.
- Setting up of IT Help Desk at SERB to address the issue.
- Strong Online Grievance redress Module.(Email, Phone, Web)

Project management & Monitoring
e-PPMS is a 5 year project for SERB, which includes development and maintenance of all the schemes implemented. This involves getting constant approvals from SERB in order to add or update the new/existing schemes.

Financial model adopted
Source of funds is from SERB as per the invoice raised. The total cost of project ownership is 3.86 Lac.
- Revenue generation: e-PPMS has been customized, configured and implemented for below mentioned government Organizations which sponsored research in various areas:

Science & Engineering Research Board (SERB): The SERB is funded by the Government of India through the Department of Science & technology, Ministry of Science & technology.

Indo-French Centre for the Promotion of Advanced Research (CEFIPRA): CEFIPRA is a model for bilateral cooperation in Science and Technology. The Centre established in 1987 receives financial support from the Department of Science & Technology, Government of India and the Ministry of Foreign Affairs, Government of France.

- Indian Council of Medical Research: The apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest medical research bodies in the world. The ICMR is funded by the Government of India through the Department of Health Research, Ministry of Health & Family Welfare.

Special efforts to ensure sustainability of the e-Governance initiative(s)

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Department of Electronics and Information Technology (DeitY), Ministry of Communications & Information Technology (MCIT) for carrying out R&D in IT, Electronics and associated areas. C-DAC has today emerged as a premier third party R&D organization in IT&E (Information Technologies and Electronics) in the country working on strengthening national technological capabilities in the context of global developments in the field and responding to change in the market need in selected foundation areas.

Challenges faced in transition

- Training sessions to be provided were to an audience that was totally new to the computer based technology. These sessions were to be designed in a way that they could provide detailed yet easy to understand explanation to the audience.
- Creation of user manuals was a tedious task as well, as it required numerous revisions based on the feedback of the training and workshop sessions.

The Lessons learnt from Change Management and Capacity building

Workshops and training sessions proved beneficial for the system itself, the feedback and response provided in these sessions helped us improve the services incorporated in the e-PPMS system.

Technology
Technology Used

Spring is the most popular application development framework for enterprise Java. Millions of developers around the world use Spring Framework to create high performing, easily testable, reusable code. It's lightweight when it comes to size and transparency. For privacy we have implemented the following technologies:

- *SSL:* We've used secure link to ensure the integrity of the data being transferred from client to server.
- *Hashing (SHA256):* To save the password of the users of the system we have implemented the SHA256 algorithm using CryptoJS.

- *Anti Samy filter:* AntiSamy is an HTML, CSS and JavaScript filter for Java that sanitizes user input based on a policy file. It is a way to make sure HTML, CSS and JavaScript input strictly follows rules.
- *Role based Access Control:* It is an approach to restricting system access to authorized users. Only users which are authentic to the system can access the resources of the system.

Compliance of the Technology adopted with e-Government standards
- *Security:* e-PPMS is fully equipped in terms of security. It uses hashing to store the password in the system. Secure authentication layer is provided. AntiSamy is used to filter out the data that reaches the database server to prevent HTML and script injection in the server. Hibernate nullifies the possibility of a SQL injection attack in the system by mapping the normal queries to the Plain old java objects. CSRF tokens are used to authenticate the web pages of the application and spring session management ensures that there is no leakage in the user session data.
- *Confidentiality:* The data is stored at our in-house data center. It is an ISO certified data center that hosts many of the government projects that have sensitive information. Its firewall and data protection policies ensure the confidentiality and the integrity of the data in the web application.

Strategy for Disaster Recovery and service continuity
We have the web application hosted at our in house ISO certified datacenter, it has its own backup policies for the application as well as the database. We have a disaster recovery site at Hyderabad which would ensure the service continuity in case of any natural hazard or disaster at the existing datacenter.

Impact and value-addition thru adaption of Social media
Currently, we have integrated our e-PPMS for SERB with Twitter and Facebook. It can be linked to many other online social networks (OSN) like LinkedIn, Google + and Pinterest etc. Linking the e-PPMS with OSNs have benefitted in the following ways:
- It helps in reaching a wider audience. Due to this, researchers are able to know about SERB and the e-PPMS easily. It has not only increased the number of visits on the online portal, but has also provided a way for the users to spread this information themselves.
- For a new system to be accepted by everyone, we need to spread the information about the credibility of the system to the users who are yet to use it. OSNs have proven to be a good medium to share this information.
- It has given us an opportunity to understand the type of audience that seeks out for the e-PPMS portal, which helps in customizing the system accordingly.
- OSNs also act as an online platform where people can share their experience about the e-PPMS. This also acts as a feedback redressal and information center for the e-PPMS.
- Information about SERB is posted on their OSN pages frequently to keep the users updated about the recent proceedings of SERB.

Technology related challenges

While implementing all the new technologies, there was an element of risk where there may be a situation where the system had to compromise at later stages. e-PPMS system already existed in many organizations. Its customization for SERB was a major task in terms of the technological changes and upgradations. It was required that the latest cutting edge technology is used in all aspects of its customization.

- The system was built on an absolutely new technology (spring and hibernate), for which trained resources were not available with the organization.
- Focus was to use open source resources which proved challenging in creating a new design for the database.
- Security has been given the first priority and thus a numerous steps have been taken to ensure that the e-PPMS is absolutely safe to Host. This involved challenges like training the existing manpower about the various security modules.

The Lessons learnt from Technology choices and implementation strategy

The risk paid off well, the technologies that were incorporated are now being used in all web application portals. They have inbuilt features that, if not used, were to be coded ourselves. Spring, hibernate not Just provided access to various modules but also optimized the code for the whole system. Now the system is scalable for huge amount of data, it is built such that it is open to numerous changes without affecting the existing setup.

VALUE INDICATORS
Digital Inclusion

e-PPMS is a system that can be accessed anywhere in the world with a basic infrastructure requirement of internet. English language has been used as a medium of instruction everywhere in the system because of its global acceptance. There is no cultural or demographic bias amongst the users of e-PPMS. Anyone and everyone can use its services if required.

Green e-Governance

- Paper consumption: the very basic purpose of building an online system was to make the whole process paper-less. E-PPPMS does not require the usage of hardcopy submission of proposal and has thus reduced the amount of paper used significantly.
- The system is accessible at all places, hence it removes the requirement of transportation to different places in-order to obtain acceptance and other necessary documents that were required in the manual system of working.

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Vidhan Sabha Online Prashnottar Pranali
Vidhan Sabha Secretariat, Government of Uttar Pradesh

Pradeep Dubey and Saurabh Gupta

PROJECT OVERVIEW

It is a path breaking application of ICT for Uttar Pradesh Legislative Assembly and the state government. It involves innovative use of information technology in the process of Assembly questions and their replies by the Government Departments. It is a complete online solution that entirely replaces all manual procedures used at any stage of the process. Looking at the critical nature of Legislative functioning, DSCs and SMS (OTP) based transaction authentication is used. This 'go-green' solution saves almost 100 lakhs paper sheets every year, relieves the dealing officers of unnecessary stress and helps in instant communication between the government, Assembly and other stake holders, including media and general public. The intended benefits of VSOPP are as follows:

- Results in huge savings of money, time and effort.
- All manual process between the Govt. Dept. and the Assembly Secretariat for change of department, postponement, change in answers etc. have been eliminated.
- The Govt. Departments are not required to submit their replies in large number of hard copies in the range of 400 of 500.
- Booklist of Listed Questions is no longer required to be sent to the Govt. for informing the listing of questions on the floor of the House.
- The efforts on the part of the Assembly to store huge volumes of stationery are no longer required.
- The delay in delivery of Question notices is completely eliminated.
- The media is no longer dependent on the hard copies provided by the Assembly Secretariat. The Question & answers are available at http://uplegisassembly.gov.in/Question_online/ Questions
- About 10 million paper sheets can be saved every year.

VSOPP comprises of four different Application Softwares:

Vidhan Sabha - Questions Management System (VS-QMS)

- It is a web application used by the Question Branch in an intranet environment for the processing of Assembly questions.
- Every question received from Hon'ble member is assigned a unique ID.
- Questions are scrutinized by the scrutinizer and then passed onto the Section Officer online.
- The Section Officer, after verification at his level, sends these questions to Hon'ble Speaker through Special Secretary/Principal secretary for final approval.
- Every question approved/admitted by the Chairman is assigned :-
- A department, who will reply the question online
- A day on which the question is scheduled for debate in the house
- The serial no. of the questions on the day of debate
- These approved/admitted questions are then made available online to the concerned departments through another web application "VS-OASYS".

- All the necessary reports are available to the question branch at every stage of question processing.
- There are 404 MLAs and 123 Govt. Departments.
- Approximately 5000 questions are received in each session of the house.

Vidhan Sabha – Online Answering System (VS-OASYS)
- This web application is available in public domain so that the departments may get their Assembly questions online.
- This application has been modified to include SMS (OTP) based authentication for all the Section Officers of U.P. State GOVT. Departments for sending answers of the questions received by them. Digital signatures are also there so that the users who want to use DSC may use it.
- The departments answer the questions online and the attachments are also sent online to the question branch of Vidhan Sabha.
- The transfer of questions from one department to another, cancellation of question and the postponement of questions are done through this application.
- Final agenda is also prepared with this application.
- All the necessary reports are available to question branch and all the U.P. Govt. departments.

MLA Online
- This web Portal is designed and developed exclusively for MLAs and they make use of it to :-
    - Submit their questions online using SMS(Verification through OTP)
    - Know the status of his submitted question through a dash board.
    - Send queries to Vidhan Sabha and get their reply.
- The features of this Application S/w are :-
    - OTP Authentication Module for Login
    - Question Submission with Image & Camera Click
    - Question Submission in Unicode
    - Question Status Report
    - Agenda Uploaded to MLAs account before 24 hours of Question Hour.
    - Analytics Reports.
    - Important News Notification Broadcast to all MLAs
    - Specific messages for MLA
    - SMS message for MLA and Department Notices
    - FAQ & Query module with Question Branch

Vidhan Sabha – Question Answers Online
This web application provides a search facility to all the stakeholders/user like General Citizen, press, research scholars etc. to know the details of Assembly Questions asked in the U.P. Vidhan sabha.

Value Proposition

A few statistics has been worked out by UP Vidhan Sabha regarding usage of Papers for the previous year. The number of papers used between Vidhan Sabha and Government Departments are much higher and are approximated 4.42 crores per annum. If we save such a huge number of papers we would have saved approx. 5500 number of trees from felling. By doing this, about 11500 persons could have been supplied Oxygen and expenditure amounting of Rs. 14.29 crores per annum approximately on usage of papers including other overheads could also have been saved by the departments which is now possible with implementation of this Prestigious Project in Uttar Pradesh.

- Legislative Assembly has a Great Role to play in making Laws, Overseeing the executives and communicating with citizens. They ensure that the citizen participate in the decision making process. The emergence of VSOPP has created an opportunity for developing creative ways through which Legislative Assembly could ensure interaction between Citizens and the Legislature.

ICT Interventions/ Initiatives Undertaken During the Last Two Years

- Responsive 'Dashboard' has been developed for real time statistical analysis
- OTP authentication module has been introduced in OASYS along with previous DSC authentication in order to make it more user-friendly
- Final as well as tentative Agenda Module has been added in QMS Application hence reducing the print copies needed. As well as it is easily available to the stake holders
- During the session time Helpdesk Facility is available for departments in order to assist them in overall answer submission process
- Pre-Session trainings were conducted for all authenticated users to make it more accessible and approachable

RESULT INDICATORS
Key Performance

Table: Key Performance Data

Particular	2015-16 Session 1	2016 Session 2
Total questions entered	4281 i.e.100%	780i.e.100%
Total accepted question	2940	585
Questions dispatched online to departments	2940 i.e.100%	585i.e.100%
Total question answered in house	1237	301
Total answers received online	1237 i.e.100%	327
Total section officers registered of different sections of various departments of u.p. state government	100 %	100 %
Total departments registered as coordinators	100 %	100 %
Total MLA registered	100 %	100 %

Particular	2015-16 Session 1	2016 Session 2
Answers availability online for public	100 %	100 %
Answers availability for media & press	100 %	100 %
Reduction in usage of paper	75 %	75 %
Reduction in time taken in complete workflow mechanism	95 %	95 %
Reduction in cost incurred in travelling for various activities while processing of assembly question	50 %	50 %
Work efficiency	Online: 100% Manual: 0%	Online:100% Manual: 0%

Implementation Coverage

Number of delivery centers

- UP Legislative Assembly
- Accessible on Inter-departmental LAN at Question Branch of U.P. Legislative Assembly
- 124 Departments of UP Governments
- Web Application accessible on Internet to all around 404 MLA's at 835 blocks in 75 districts across
- The application uplaquest.uplegisassembly.gov.in where the complete proceedings of every house of U.P. Legislative Assembly are broadcasted after processing from QMS, OASYS, and MLA Online is accessible to each and every citizen of India across India for various purposes like research, analysis or information gathering.

Geographical

- National level - Number of State covered   – One (Uttar Pradesh)
- State/UT level- Number of District covered – 75 Districts of Uttar Pradesh
- District level- Number of Blocks covered   – 835 Blocks of Uttar Pradesh

Demographic spread (percentage of population covered)

- 404 MLA's
- Question Branch of UP Legislative Assembly
- 124 Departments of U.P. State Government
- 430 Sections under 124 Departments of U.P. State Secretariat
- Research Scholars
- Media Persons and General Citizen

Table: Outcomes in terms of Efficiency, Improvements and Integration

MLA	Time Saving, Money Saving, Real time reporting, Ease of access
Question Branch	Time Saving, Money Saving, Paper Saving, Real time reporting, Ease of access, Paper archival reduced, Query management system, Ease of approach to departments, Up to date repository of users
Departments	Time Saving, Money Saving, Paper Saving, Real time

/Sections	reporting, Ease of access Paper archival reduced FAQ, Video Tutorials / Training Sessions, Ease of approach to question branch
Research Scholar	Real time reporting, Ease of access to all UP Legislative, Assembly session questions, User friendly web portal, Dashboard for statistical analysis
Media Persons/ General Citizen	Ease of access to all UP, Legislative Assembly session questions, Data availability 24 X 7, Time Saving, User friendly web portal

ENABLER INDICATORS
Process Re-engineering

Table: Process Re-engineering

Old System	New System
For Question Branch of U.P. Legislative Assembly	
Questions were received manually	An interface in QMS is designed to receive question online using internet
Entry of question related information in Title Entry Register Diary Register which comprises of one diary for each day of a week separately according to the day allotted to a particular department Summary Register, where final state of question is registered	Specific Users Interfaces in QMS(Question Management System) are designed for each user like – Data Entry Users for Title Entry and Full Text Entry Specific interface to allocate Vaar No. and Vaar Type which replaces all the set of Diary Registers entry After the proof reading of questions, whether a questions is accepted or rejected and all the related information is being fed by Scrutinizer User using the specified interface
Change in Question Type (Starred / UnStarred) was done manually	An interface in QMS (Question Management System) is provided to the concerned authority to make changes related to this
There was no management of data, all records were manual on papers	All the entries done are stored in a specific database linked with the application (QMS) being designed. Hence digitized data.
It was a very cumbersome mechanism to generate reports manually after going through a pile of registers	All the required reports are automated and can be generated using QMS (Question Management System) on a single click. A dedicated interface is designed to generate reports
No tracking of work done	A dashboard is designed in QMS for the higher authorities to keep track of work done

Old System	New System
For Question Branch of U.P. Legislative Assembly	
Send questions to concerned department manually for getting replies	An interface OASYS(Online Answering Information System) is designed in which questions become visible when transferred by the authorities of question branch as soon as they are received and processed at Question Branch of Legislative Assembly
Complete agenda of questions for a particular data was generated manually by the officers of Question Branch after rigorous consultation of all files and registers	Complete agenda can be generated easily on a single click using QMS (Question Management System) by providing Vaar No. and Vaar Type of a particular date
For Members of Legislative Assembly	
Member have to visit question branch of U.P. Legislative Assembly to submit his/her 5 questions maximum on daily basis	An online interface MLA Online is designed for the members using which they can send questions to Question Branch from their respective places
Members have to keep record of all the questions submitted manually	All the questions submitted using MLA Online can be viewed by member at any instant of time from anywhere
Members have to visit question branch of U.P. Legislative Assembly to get their queries related to questions processed during sessions conducted	All the Questions & Answers processed during sessions are uploaded online on http://uplegisassembly.gov.in/ and can be accessed from anywhere
Documents were not secured, there were chances of fake question submission	Online interface MLA Online uses a secure mechanism which allows login by MLA only after verification of its User Id, Password and Digital Signature attached with it.
For Departments of U.P. State Government	
Departments have to wait to receive questions notices manually from Question Branch of U.P. Legislative Assembly	An interface OASYS (Online Answering Information System) is designed where each department can login with User Id, Password and DSC (Digital Signature) provided and view questions allotted to it.
Send notices regarding requests for change in department, postponement and change in answer manually to the question branch of U.P. Legislative Assembly	Using OASYS (Online Answering Information System), department can send all such requests to the Question Branch online.
Inter-Department requests were also manual and very time consuming	Online requesting mechanism provides an easy and fast mechanism for all kinds of requests.

Old System	New System
For Departments of U.P. State Government	
Reports generated at various levels were manual after consulting piles of records and that may be erroneous	Reporting feature is also provided in OASYS (Online Answering Information System), where each department can generate reports specific to its need
Since all the records were managed in files, registers manually, there were chances of losing them in any natural hazards	Digitized data with the mechanism of back up makes it secure from natural hazards
For General Citizen, Media Persons	
There was no mechanism for general citizen to know about the proceedings of house	They can view proceeding of house online by visiting http://uplegisassembly.gov.in/, where they get complete details about the questions asked by their region MLA and its answer from concerned department
Separate booklets for media persons were printed in order to provide those with complete details.	Complete data is online which reduces the need of printing booklets specifically for media persons.

Leadership, Change Management, Capacity Building during Transition
*Leadership-*VOSPP is one of the leaders E-GOV Solution of its kind and implemented successfully. UP Legislative Assembly has become the India's Premier ever high-tech Legislative Assembly by implementing VSOPP in coordination with UP Vidhan Sabha, UP Government & NIC.

Change management- Hon'ble Members may submit Assembly Questions manually or online. After registering questions online at Notice office, questions are assigned online for typing and proof reading is also done online. As the Hon'ble Chairman, Vidhan Sabha approves, the questions are automatically sent online to concern departments for acceptance. After fixation of questions through an online engine, questions are approved by the Hon'ble Chairman, Vidhan Sabha and are sent online automatically to Departments for sending the replies and are published on Web. Process of Bracketing, Clubbing and Postponing of questions is also online. http://uplegisassembly.gov.in has public & secure website. There is also a facility to send SMS and eMail automatically to notify the concern stakeholders / users regarding the necessary information.

Project Management &Monitoring- UP Vidhan Sabha has constituted a Committee to monitor the Project and also established a Project Monitoring Cell & Computer Centre to look after all the ICT Activities related to this Project.

*Financial Model Adopted & Sustainability(Owned by Department)-*UP Vidhan Sabha has allocated fund of *Rs. 20 Lakhs Per Annum (Approx.)* to hire the Cloud Services and Technical Manpower deputed at Project Monitoring Cell yearly.

Entire ICT Infrastructure like H/w, LAN, Bandwidth are being utilized by Vidhan Sabha & 124 Departments that have been provided in various other e-Gov Projects funded by Secretariat Administration Department. NIC along with UP Vidhan Sabha have adopted Cheapest & Very Sustainable Model to execute this Project in a long term.

*Savings-*Expenditure amounting of Rs. 14.29 crores per annum approximately on usage of papers including other overheads could also have been saved by the departments which is now possible with implementation of this Prestigious Project

Technology

- For developing the front end i.e. the user interface for all the four applications :-.NET framework 4.5, IIS 7.0
- At back end i.e. database for data storage and processing :- SQL SERVER
- For designing GUI (Graphical User Interface) :- HTML5(HYPER TEXT MARKUP LANGUAGE 5), Java script, J-query, CSS and BOOTSTRAP
- Intel® Xenon® cpu X5650@2.67 GHz :- Virtual Machine 1- 4 LP 12 GB RAM, Virtual Machine2 -4 LP 12 GB RAM, Virtual Machine 3-4 LP 12 GB RAM, Virtual mm-24 GB each
- Client :- Windows 7 and later
- Browser :- IE 8,9 and Google Chrome, Firefox
- Web Services Push/Pull SMSs, facilities to save reports in PDF, services to upload documents in the form of images or PDF
- For DC & DR Services- Department has hired the GoI Cloud Services and host the application & Data at MEGHRAJ Cloud.

VALUE INDICATORS
Digital Inclusion

- The VSOPP Solution has transformed almost every aspect of stakeholders and their work life.
- VSOPP has been developed in local languages Hindi and English understandable by all the stakeholders of VSOPP. All the perspective user & stakeholders have getting full benefits & advantages of this Solution.

Green Governance

- As an another leap towards Green Governance, Department now deciding upon having all the questions related documents, provided to different departments, digitally signed and thus making sending signed documents by post, an old tale of the past. Following table depicts about how much savings can be done by achieving green governance:
- Direct Cost saving in terms of paper under various modules Online question submission, online register maintenance, online answer submission, generation of reports, generation of tentative agendas, generation of final agendas during a session:

Table: Total saving for the department in terms of Paper, Postage, Fuel and Employee during a Year

Cost	Per Month	Per Year
Paper Cost @ 1 Rs.	36,73,714	4,40,84,568
Postage Cost @Rs 25 per speed post	24,23,050	2,90,76,600
Fuel Cost @Rs 60 per trip Document	58,15,320	6,97,83,840
Total	**1,19,12,084**	**14,29,45,008**

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Leveraging Technology Towards Digital Transformation
Selected e-Governance Initiatives - 2016

Award worthy e-Government initiatives of various government authorities at Center and State level of India provide a significant opportunity towards experience and knowledge sharing. This book consisting of select e-Governance projects, who participated in the CSI Nihilent eGovernance awards 2016 process, aims to contribute towards understanding of use of technology for leveraging digital transformation from an Indian context.

Each of these projects present a view of critical success factors, classified into result and enablers indicators, towards achieving project objectives set out by the project owners.

These initiatives are not only steps taken by government towards digital transformation of India but also to protect the environment by reducing government's and societies' carbon footprints.

The e-government initiatives are presented theme wise / sector wise such as Citizen Services, Education, Election, Energy, Health, local bodies, Police, Public Distribution and Transport etc for ease of reference.

For e-Governance practioners, researchers and Industry professionals, compendium published under the series 'Selected e-Governance Initiatives' by Computer Society of India's Special Interest group on eGovernance (CSI-SIGeGov) continues to provide a rich source of information for discerned readers.