Section III

e-Governance Initiatives Success Stories
Department Initiatives

CHAPTER 8

*Andhra Pradesh Forest Department**

Shri C Madhukar Raj and Shri P K Sharma

I) Overview

Forest Department of Andhra Pradesh has adopted Information Technology in a big way as DSS for the Management of natural resources in Planning and Implementation of different projects. Modern technologies like Remote Sensing (**RS**), Geographical Information System (**GIS**) and Global Positioning System (**GPS**) **& DGPS** have been deployed in the day-to-day administration and management of forests and monitoring various activities, which has led to improvement in efficiency, transparency and ease of monitoring. The Dept. has executed GIS and RS-based projects in the past like Vegetation Cover Monitoring, Fire Risk Zonation Mapping, Site Suitability of Water Harvesting Structures and Site suitability of Plantations. It has also carried out Statewide Inventory of Forest Resources using modern tools and carried out survey of assets of VSS, Forest Blocks and Forest Conservation Act areas using DGPS. The Dept. has also deployed a number of web-based Forests Management Information System Modules for monitoring various activities of the Department and been a pioneer among the Forest Depts. of the country.

APFD has brought out a comprehensive report on the growing stock and the status of forests in the State of Andhra Pradesh in 2010 based on the field work carried out between 2006 and 2008, titled "**Andhra Pradesh Forest Inventory Report, 2010**". It was a unique venture of a large scale Statewide inventory of the forests resources, attempted for the first time in the country. The department has also brought out comprehensive reports on the forest cover changes at the lowest

* *Winner of CSI-Nihilent e-Governance Awards for the year 2010-11.*

level of forest administration, i.e., Beat level, during 2010 and 2011 in the form of "**Andhra Pradesh State of Forest Report 2010**" and "**Andhra Pradesh State of Forest Report 2011**" using Remote Sensing data.

It has taken a new initiative of **online MIS, APFMIS** with a view to create almost **paperless offices,** reducing redundancy at all levels of the hierarchy for obtaining data from the field level officers through customized data capture modules and generating reports for various levels of Officers and providing them with a tool to analyze the data for better administration and improving efficiency at all levels.

The Department has also been building the capacity of department's officials in the use of modern technologies.

As recognition of the efforts at national level helps motivate the teams engaged in the development and transfer the services employing modern technologies, hence the APFD is submitting the nomination.

Andhra Pradesh is the 4th largest state with 2nd largest forest area in the country with an area of 63,814 Km^2; around 23% of the Geographical area. The department is organized into (13) territorial Circles and (14) functional Circles; (46) territorial Divisions and (62) functional Divisions; (204) territorial Ranges and (222) functional Ranges; (930) territorial Sections and (759) functional Sections and (2611) territorial Beats and (305) functional Beats. (1458) Asst. Beat Officers assist the FBOs. The primary function of the AP Forest department is protection, conservation and management of forests, wildlife and Bio-diversity. Managing this vast natural resource has been a herculean task. Efficient Forest Resource Management requires capturing rapid, reliable and accurate information about the status of various activities connected with Forest and Wildlife. This requires strengthening the current forest planning and management systems using latest technologies and development expertise in-house. The Department has been traditionally managing vast amount of data and images manually, which was cumbersome and time consuming. The modern technologies make the above task simpler and increase efficiency by cutting down the time on redundant activities. Therefore, Andhra Pradesh Forest Department has started out in making use of modern tools of Geomatics like RS, GIS, GPS and MIS in aiding the

planning, execution, monitoring and evaluation of all the activities. These steps are leading to development of a robust Decision Support System (DSS) for the Department.

The Dept. has acquired expertise in a relatively new field and has developed a team in-house to handle all the technologies. The following are some of the Projects executed by the Department, using Remote Sensing, GIS, GPS and Web technologies.

1. Spatial Database creation
2. Vegetation cover Monitoring
3. Fire Risk Zonation Mapping
4. Selection of Suitable Sites of Water Harvesting Structures,
5. Wildlife Habitat Mapping and Bio-diversity Characterization. (Some key areas)
6. Selection of Suitable Sites for Eco-tourism (Some key areas)
7. Selection of Suitable Sites for Coffee and other Plantations. (Some key areas)
8. Andhra Pradesh Forest Inventory
9. Micro-level Watershed Planning using DGPS (Some key areas)
10. Recognition of Forest Rights under RoFR Act (Some areas completed and remaining areas in progress)
11. Online GIS services using Enterprise GIS Server
12. Online Andhra Pradesh Forest Management Information System (**APFMIS**), etc.

The efforts of the Dept. have been recognized by the Govt. of India in the past and have been awarded with **Silver Icon** during the year 2004 for "Fire Risk Zonation Mapping" and with **Golden Icon** for "Site Suitability of Water Harvesting Structures" during the year 2005 for excellence in the e-Governance Initiatives.

The output of the above initiatives has been made available to all the Officers and Staff and the communities, who have been sensitized in the use of these technologies

in day to day administration and preparation of Micro Plans at the VSS level, respectively.

II) Result Indicators

1. Key Performance

a. Service Delivered (G2C, G2B, G2G, G2E)

G2G: Most of the activities of the department in the past were highly time consuming, giving very little time for proper analysis and use in the decision making. To elucidate this point, it is to inform that identification of encroachments in the forests was highly time consuming for the field officers, especially in the hilly terrain. Now with the deployment of RS, GIS and GPS technologies, the officers can straight away walk to the sites and take appropriate action. It saves 90% of time of the field officers.

The Work Estimates are being prepared by the executive officers using APFMIS by selecting readily available menus and time is greatly saved and it is not prone to errors.

The reports generated through various modules of APFMIS at various levels are highly useful and time saving. This time is reduced to a fraction compared to the time needed in data collection compilation and use through snail mail. APFMIS removes manual and subjective errors/biases.

Initial cost of procurement of hardware, software is high but in long term it will prove to be highly cost-effective as the benefits in terms of empowering the officers at all levels and enabling them in taking correct and timely decisions will far outweigh the costs.

G2C: Various types of maps and vector layers of Forest areas and Reports of Forest Inventory, State of Forest Reports and various other reports are kept on the web for the use of general public. This brings in transparency in the operations and aids the Researchers in advancing their works. This serves as a sensitizer to communities and other sister organizations. The NGOs can also make use of the data for their projects.

b. Implementation Coverage

The Implementation coverage is whole of the 63,814 Sq. Km of Forest Area of Andhra Pradesh (All the items mentioned in 2-2) area-wise and 50% functions-wise. Future plans are to provide PDAs to field officers enabling them to enter data on the central server direct from the field specially pertaining to offence cases (Registering of PORs), Nurseries, Plantations, Wildlife Monitoring, etc. and to cover all the remaining functions (pertaining to HRM and HRD, Budgeting & Accounts, JFM, Timber sales, Establishment matters, etc.) in the next 1-2 years.

2. Efficiency Improvement Initiatives

a. Time and Cost Efficiency

The time of the executive officers and staff, regional officers and Head Office Officers as well as staff is saved as the data is received almost on time basis and period of wait, which sometimes ranged up to 6 months, is reduced to a maximum of 1 week. As this data is available on the web, is available to stakeholders as well as general public. Now they need not approach various offices for supply of information.

b. Innovative ideas Implemented

Both, the department officials as well as common public and stakeholders are benefited. For example, even the clearance of Forests for encroachments, is identifiable to sub-Hectare level. This precise information helps the field officers in effectively and timely dealing with the Offenders. It is also leading to increase in the accountability on the part of field.

The Applicants for Mining Licenses, New Sawmill Licenses etc. can easily come to know if the proposed location/s and the extent are falling inside the RF/ proposed RF or a WLS or NP; by plotting it on Arc GIS Server and make appropriate decision. It relieves the dependence of the public on the FD for each and every work.

c. Integration with Other Departments

The facilities available have extensively used by **Rural Development** department, specially the IWMP, for better management of the Watersheds.

The services have also been utilized by the **Tribal Welfare Department** in mapping of the rights of the Tribals and Traditional Forest Dwellers under RoFR Act, 2006.

Irrigation department, **Electricity** department and others like **GHMC** etc. have also benefited from the facilities of the Geomatics in the Department.

III) Enabler Indicators

1. Department Policy and Strategy

a. eGov/ICT Vision and Road Map

A new **ICT Vision document** is prepared in year 2011 focusing on A to Z of the ICT in the department. It includes ICT hardware, software, human resource, connectivity and other infrastructure; and sources of funds for the same including Capacity Building of the Department Officers and staff. It is being sent to Centre for Good Governance/APTS for vetting. However, as per the APO of 2011-12 of the CAMPA-NPV Project and the 13th Finance Commission Schemes (i.e., major sources of funding), action to procure H/W, S/W and CB is going on.

b. Sharing of Common Infrastructure

APFD has been striving to achieve excellence and avoid duplication of works. In this endeavor it has obtained as well as shared data and common infra-structure with the Forest Survey of India, Dehradun & the NIC at national level and The NRSC Hyderabad and AP State Remote Sensing Applications Center (APSRAC) at State level. The AP Forest department has been providing its GPS and other Lab facilities at nominal rates to Other Government departments. Besides, it is helping/guiding many students of the Universities and Colleges in pursuance of their Degrees, PG and Doctoral thesis.

c. Technology Standardization

A Technical Advisory Committee (TAC) has been constituted by the State Government Order (G.O.Ms.No.121 dated 04-12-2009, EFS&T (For-III) Dept.) by nominating Members from various National and State level organizations like NRSC Hyderabad, MoEF GoI New Delhi, FSI Dehradun, APSRAC Hyderabad and Officers of the AP Forest Department to guide the activities of the GIS wing. All the activities are undertaken as per the advice of the experts.

Besides the above, there are Technical Committees for various purposes constituted by the PCCF for data standardization as well as procurement of IT-related equipment and software and services.

2. Process Re-engineering and Reforms

a. Major Non-ICT front end Process Changes

In the past, all procurements were done following the traditional method of calling for tenders etc. by giving paper notification. Now it has been replaced with the system of e-Procurement to have greater participation and to ensure transparency and fair play.

Traditional method of surveys has given way to GPS/DGPS surveys saving lot of effort and time. Around 2000 GPS sets are available in the field. In the past each Division was provided with an Arc-View GIS and now all the required functions have been made available through web-enabled Arc-GIS Server. The customization is nearing completion.

It is planned to procure PDAs with GPRS connectivity and cameras to monitor most of the important activities like wildlife sightings, seizure of forest produce in offence cases, plantation details, nursery stocks; including movement of staff and their field observations. This will enable better monitoring by the superiors and will provide timely guidance to the field officers.

b. Major Non-ICT back end process changes

As the GIS and MIS are in use in the Department for last 10 years, the back-end ICT is ready for general applications. However, it is planned to integrate all the data collected using geo coordinates and the unique codes to each geographical unit and person within a period of next 6 months.

3. Capacity Building

a. Leadership Support and Visibility

The AP Government and the APFD leadership in particular, is highly pro ICT. They are providing all the budget, support and guidance needed for deployment of the ICT Plan.

b. Change Management Strategy

It is planned to manage the change by regular trainings to all the concerned on the new technologies and applications. Training modules have been prepared keeping in view the needs of various categories of the Officers and staff in various fields. Further, CB activities have also been decentralized; certain trainings and programes will be conducted at State HQ level, while others would be at Circle, District, Division and Range level, so that benefit of changes proposed is quickly disseminated to the ground level.

c. Capacity Building Plan and its Implementation

It goes with the change management programe. Capacities of the officers and staff would be strengthened by custom made, decentralized training programes.

d. Program Management Teams

Yes, the programe management teams, known as **Core Functional Groups** (CFGs), are in place. They are full time department officials, having been identified based upon their aptitudes, expertise and domain knowledge with interest in the field of ICT. They are supported by programmers and GIS scientists, taken on contractual basis.

IV) Value Indicators

1. Digital Inclusion

Steps taken to address this factor

Stakeholders, specially the frontline staff and the Communities (VSS members) are being educated in the use of new technologies in their own mother tongue. Manuals and reading material are being provided in Telugu. Some Web-Mobile applications are also proposed to be in Vernacular language, besides English.

2. eParticipation

Steps taken to address this factor:

Most of the information is being captured through Web-based applications. Many such applications are in place and many more are in the pipeline.

3. eWaste

Steps taken to address this factor:

The e-Waste generated is being recycled/disposed of as per the Orders issued in G.O.Ms. No.24 dated 03-09-2010 by the Government of Andhra Pradesh as part of its eGov initiative

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CHAPTER 9

*eGovernance at Chief Minister's Office (CMO)**

Dr Hiren Joshi

I) Overview

On June 23, the Chief Minister's Office (CMO), Gujarat, won the prestigious 2010 United Nations Public Service Award (UNPSA) for innovative use of information technology to address public grievances. CMO is also certified ISO 9001:2008 since last three years with scope related to administration and overall governance. Effective use of IT has played an important role in getting this certification. CM office implements the e-Government strategies and professional IT development which contribute to achieve positive transformation – '**Change for Performance**'. CMO plays a vital role in sustaining the democratic ethos of the society and ensuring a high level of transparency in governance. Chief Minister Office (CMO) is the focal point of GoG performing innovative, constructive and result-oriented progressive policies for the promotion of e-governance in the State. It acts as a catalyst to play a significant role in the affairs of the State.

Overall governance of the state with efficiency and transparency is the primary objective of the Chief Minister's Office. It adopts leadership, people, process, partnership and resources in process to enhance e-governance initiatives of GoG.

Active participation in e-governance by Hon'ble CM with infrastructure, policies and e-governance road map, charter to implement ICT as a vehicle for transforming Gujarat into a knowledge-based, economically vibrant, democratic

* *Winner of CSI-Nihilent e-Governance Awards for the year 2010-11.*

and inclusive society. CMO plays a vital role in sustaining the democratic ethos of the society and ensuring a high level of transparency in governance. It further focuses on 'digital gap' and implements ICT-enabled egovernance in almost every sector of socio-economic activity ranging from industrial production to education and public healthcare for improvement in the quality and efficiency of human endeavors. It encourages E-readiness initiatives in CMO and all ministerial and department offices.

The experience gained shows that the major challenges that are faced by Gujarat State Government to implement an e-Governance project are:

1. to overcome inertia to change work culture
2. to upgrade skills and increase awareness
3. to introduce changes in infrastructure
4. to redefine rules and procedures (legal/tech)
5. to ensure security

Having overcome challenges, Some of the remarkable '**Changes for Performance**' achieved are:

1. Effective policy making
2. Ensured 'Environment-Friendly' office
3. Development of a collaborative and structured work environment
4. Efficient work/task prioritization
5. Enhanced and efficient monitoring and control of various files, work items of CMO
6. Enhanced internal information exchange
7. Building up a sharable knowledge base system
8. Automated the routine tasks
9. Automated the generation of file number and tracking
10. Standardized common processes
11. Reduced cycle times and dependencies
12. 24*7 access to relevant information

This section should give **high level** introduction to the Department and should explain the overall approach to the e-Governance plan and current status.

e-Governance is visualized as Governance by a 'SMART' Government at CMO which is Systematic, Methodical, Accountable, Responsive and Transparent government.

CMO overhaul Major Initiatives for strategic performance with its enhanced IT Policy 2006-2011. CMO encourages E-Readiness Initiatives in all departments with IT Action Plan with a one year focus and a five-year perspective. CM motivates and encourages other ministerial and Department Offices for E-readiness and implements workplace task force to perform as per his vision and mission.

Primary Activities of the Chief Minister Office

The main activities of the CMO in coordination with various department Boards, Corporations, Heads of the Department, etc. are as under:

1. Effective and better governance of overall state activities.
2. Ensuring overall economic, cultural, social progress of the state.
3. Appointing different ministers for regulation of various departments.
4. Effective utilization of the budget.
5. Provided better infrastructure facilities and safety measures to the citizens.
6. Regulation of funds collected from the taxes for the betterment of the citizens of the state.
7. Providing funds to the needy and the victims of natural calamities from the "CM Relief Fund".
8. Introducing, implementing and monitoring the different schemes.
9. Timely and optimum utilization of all the natural resources available.
10. Promote foreign trade and improve relations with neighboring states.
11. Managing in-house work flow like Secretarial Functioning within GoG Departments, Effective Time Management with CM's Schedule, PRO/ Media Meetings/Programs/Public Forum/CM. Instruction for state image building and justification of negative news/program/trends. Approval of all media press notes/program clips before publishing

Major eGovernance and reach of initiatives

1. Policy/strategy drafting is initiated by CMO for functioning efficiently and to achieve its public mission to provide convenience to citizens along with sustainability, innovation and reliability.
2. Implementation of IT strategies to accomplish effective eGovernance.
3. All departments are in the process of creating shareable databases of rules and other information pertaining to administration including information such as budget, recruitment/service rules, plan achievements for various schemes, etc.
4. Integrated Workflow and Document Management System (IWDMS) is implemented across the Government Secretariat, which increases Accountability, Transparency and Effectiveness in Government administration.
5. State Wide Attention on Public Grievances by Application of Technology (SWAGAT) – At Jansampark Department of Chief Minister Office, the grievances of the common man are addressed through video conferencing and solutions are provided online immediately. Since the implementation, 92.45% of the applications received have seen justice through the mutually united initiative of all Department heads.
6. The GSWAN project saw a boost from the CMO for the Secretariat office Activities. It facilitates intra government communication. It involves active participation through 20015 email ids created for Government offices all over the State.
7. Systematically monitoring and integration of activity-oriented MP/MLA system is performed by the CMO apart from formulating relief fund processing, visitor and telephone diary systems and other fields that need CMO governance.

ICT is an enabling tool that achieves the Vision of Development and effective Governance that has been established for Gujarat. Using various ICT interventions, we are committed to accelerated growth and cohesive social development through the following measures:

1. Providing SMART governance to the people of Gujarat.
2. Empowering citizens and providing equal opportunities through appropriate information dissemination .
3. Making the Government accessible to citizens anytime, anywhere and serve them in a more effective and empathetic manner.
4. E-readiness initiatives with in-house implementation at workplace – Task force to perform as per vision and mission of CM. The Government is thereby, geared for e-governance right from the grass root levels.

Other features:

1. Grievance registration: online lodging of grievance and online status tracking available.
2. Online Appointment and tour scheduling and automatic updation of appointment list for Hon'ble CM.
3. Online employees' requests submission for various entitlements like leave, advance payment, etc. with ability to track the same online. Online records of such requests are also maintained.
4. Online appointment scheduling for Chief Minister
5. Implementation of ICT-enabled CM website www.narendramodi.in and State Portal, www.gujaratindia.com.

Performance Goals

CM believes that technology alone can foster e-Governance and that good governance can only happen through an efficient, proactive and citizen-friendly system.

Hence, the GoG initiated a massive training program to reorient over 5,00,000 state government employees and to strengthen the administrative machinery.

Chintan Shibirs are annual retreats for ministers and senior government officials for brainstorming, progress review, goal setting and developing a collective vision while V-Governance is a unique training initiative for Vibrant Governance through 'change in mindset'. Till date, 4 Chintan Shibirs have been held and lakhs of officers/ employees have undergone the V-Governance training. In addition to government officials, over 2.5 lakh teachers too have undergone the *karmayogi* training.

II) Result Indicators

1. Key Performance

Services Delivered (G2C, G2B, G2G, G2E)

GoG remain focused on—and committed to—Transparency, Participation and Collaboration. CMO is the focal point with improved task operations with ICT enabled features—an open government initiative that has its impact on deliverance of G2C, G2B, G2G and G2E.

1. G2C Service: Citizen

Enhanced access to public information through the use of dissemination tools, such as:

State Portal and CM Narendra Modi's website: Provides transparency. Highlights policies and development projects and initiatives. Increases venues of communication between the CM and the citizens through updates, news stories and online interactions. Live Audio, Video and Photo features reflect the CM's bold strategies for Development and governance.

SWAGAT provides right platform to the citizens to avail various government aids and raise their issues/concerns to top leadership for effective and speedy resolution. Registering common man / public grievance and forward to concern department for closings and make sure that compliant has been resolved without unwanted delay. SWAGAT program every week with effective planning & execution and its closing and for a reach to Villages 'Gram Swagat' is effective with G2C service.

2. G2B Service: Business

- Focus on effective compliance management and transparency.
- Provide business information and simplification through website download of policies, project and initiative highlights and links to related websites eg. Vibrant Gujarat (through State Portal and CM's website).
- E-communication between Department and stakeholders through e talking, e messaging and sms.
- Speedier conveyance of Decisions to concerned Departments/stakeholders.

3. G2G Service: Government

- State MP/MLA can raise the issues/concerns of their respective constituency through MP/MLA application. This integrated application not only brings issue in notice of CM but also routes the same to appropriate department authorities for resolution through a electronic workflow.
- Integrated Workflow and Document Management System (IWDMS) is implemented across the Government Secretariat, which increases Accountability, Transparency and Effectiveness in Government administration.
- Dashboard Facility: State Portal Gujaratindia.com is enhanced with Departmental Dashboard facility. The feedback/complaints, etc mails reach straight to Departments with a copy to CMO. Interactive emailing and timely action is noted by CMO for the same. Also In-House Interaction related to people-centric services are taken care of.

4. G2E Service: Employees

- Continuously strives to improve efficiency, effectiveness and transparency of intra department and inter department interactions (Government and with Government employees).
- Provide Human resources—enhanced facilities to employees.
- Conducts massive training program to reorient over 5,00,000 state government employees and to strengthen the administrative machinery. Chintan Shibirs are annual retreats for ministers and senior government officials for brainstorming, progress review, goal setting and developing a collective vision while V-Governance is a unique training initiative for Vibrant Governance through 'change in mindset'. Till date, 5 Chintan Shibirs have been held and lakhs of officers/employees have undergone the V-Governance training. In addition to government officials, over 2.5 lak teachers too have undergone the karmayogi training.

Implementation Coverage

- Various e-gov initiatives like IWDMS CMO and SWAGAT have been implemented and operational. Additionally, as part of grievance processing, IWDMS CMO has been integrated with other departments and their

District Collectorate offices for effective resolution of these grievances. These district offices are spread all across State.

- Swagat online Grievance Redressal Program "Gram Swagat"—has been rolled out for villages with aim to reach remote rural corner of the state to help their problems solved.
- State Portal Gujaratindia.com is actively operational with G2C (citizen) G2B (Business) and G2G (government) facilities whereas CM's website is fully functional with transparency with G2C. Partake with Government, e-Transcriptor and iGujarat are some important roll outs apart from videos, audios, etc.

2. Efficiency and Improvement Initiatives

Time and Cost Efficiency

- 50% time reduction achieved for Grievance handling process—SWAGAT.
- Mail management becomes efficient and average mail processing becomes faster by 80%.
- MP/MLA reference processing also became faster by 50%.
- The clerical manpower (6-8%) can be reallocated as the work being done by them earlier has been automated, thus resulting in cost benefit.
- Reduction in ICT spending with enhanced features.
- Simplified business focused with G2B effective business compliance and management.
- Improves efficiency, effectiveness and transparency of intra department and inter department interactions with Government and with Government employees. (G2E).
- IWDMS is a project for improving the productivity of Government Employees and increasing the transparency in Government administration.

Innovative Ideas Implemented

- As file is the basic unit of workflow, every file has been assigned a unique identification to enable a qualitative control of tracking/monitoring of same.

workflow item in the form of Unique File Number for better tracking and tracing

- E-mail and SMS Alerts: The employees can receive alerts on documents received in their inbox.
- Digital signature: This is being incorporated for authenticating documents and also for ensuring security of crucial transactions.
- Dashboard for tracking: The dashboard along with drill down facility provides the view of pending files with an officer and his subordinates at any given point in time.
- Pocket appointment scheduler: A provision for mobile version of appointment schedules for handy reference by Hon'ble Chief Minister.
- Dynamic priority management of file based on ageing, subject and other factors supported by automatic notification.
- Automated updating of appointment schedule once in 3 minutes for Hon'ble Chief Minister.
- A graphical interface for managing one's delegated work assignment to various subordinates along with the capability to re-assign and monitor the status of work.
- Hon'ble CM's web presence is at top among the leaders in India. People can connect with him on twitter, facebook, blog and on official website.

Integration with other Departments

- Major eGov initiatives like IWDMS CMO, SWAGAT have been completely integrated with other Departments. SWAGAT online is being viewed as models a for replication at the national level.
- Dashboard @ State Portal—Department can access their dashboard by using a unique login and they can update/post content to State Portal with dually moderated mechanism; department can even see query/feedback posted to each department and reply to each.

III) Enabler Indicators

1. Department Policy and Strategy

eGov/ICT Vision and Road Map

ICT is not an end. It is an enabling tool to achieve the Development and Governance Vision of Gujarat. Using various ICT interventions, CMO is committed to accelerated growth and cohesive social development through:

- Providing SMART governance to the People of Gujarat.
- Empowering citizen and providing equal opportunity through articulate information dissemination.
- Making Government accessible to Citizen anytime anywhere and serve the citizen more efficiently and effectively.
- E-readiness Initiatives with In-house implementation at Work place—Task force to perform as per vision and mission of CM. Thereby, geared for egovernance from grass root levels.

e-Governance Vision of Gujarat

To become first State in the Country so as to make Transparent, Efficient and Effective Government to Citizen (G2C) Government to Government Services available Online. G2G with the Dashboard facilities to Departments is an Innovative approach through CMO.

e-Governance Road Map

It is an initiative to make a detailed Roadmap of all the ICTs initiatives that will be undertaken by the GoG over the next 3 years. The big picture of e-Governance blueprint of Department is transparent on its State Portal www.gujaratindia.com and CMO Department Initiative of CM's website www.narendramodi.in

Sharing of Common Infrastructure

State and Department:

GSWAN: Gujarat State Wide Area Network

SDC: State Data Centre

SICN: Sachivalaya Integrated Communication Network

Technology Standardization

GoG has taken a giant step towards technology standardization across its various functional units, i.e., departments. An integrated information system based on open standards, J2EE architecture has been implemented across various departments and in HoDs. With the adoption of open standards technology, CMO department has moved towards interoperable systems leading to easy integration with other e-government solutions and is effective with ease and improved efficiency.

2. Process Reengineering and Legal Reforms

Major Non-ICT front-end Process Changes

- Grievance registration: online lodging of grievance and online status tracking available.
- Online appointment and tour scheduling and automatic updation of appointment list for Hon'ble CM.
- Online employees requests submission for various entitlements like leave, advance payment, etc. with ability to track the same online. Online records of such requests are also maintained.
- Online appointment scheduling for Chief Minister's programs.

Major Non-ICT back-end Process Changes

- Electronic file and correspondence movement, tracking and processing with a dashboard.
- Electronic workflow for ESS and HRMS processing.
- Electronic processing for Visitor passes, Grievance processing, Appointment scheduling, Relief fund processing.

3. Capacity Building

Leadership support and visibility and current status

The Gujarat Government adopts the Total Quality Leadership rooted with timeless principles:

- Faith, hope, humility
- Industry, research, technology
- Constancy, consistency, predictability

- Continuous improvement and progression
- Virtue, selfless service, truth and human relations

The Government is absolutely apolitical with P2G2 – Pro people, Pro active —Good Governance under the leadership of Hon'ble CM and is the most 'fast-forward' State of India with political stability, entrepreneur spirit and represents uniformity of development as well as unanimity on the issues of development.

The strategy adopted by Government of Gujarat was to follow Top-down approach. A major e-gov initiative, i.e., IWDMS, SWAGAT have been first implemented in Secretariat to set example, gain visibility and ensure continuous support from top leaders at all levels. Thereafter, extension of E-gov program was carried out at HoD and other hierarchy levels under guidance and support of top leadership. Moreover, CMO is the main center for top leadership activities and various e-gov initiatives. CMO has natural advantage of continuous attention and support of top leadership.

Social Media Presence is a major Initiative by the Leader with website, Blog, Social network integrations like Facebook Page, Twitter and You Tube. The Gujarat Government's Department of Information has announced the use of Social networking websites Facebook and Twitter. This enables the Government to connect to technically versed generation, predominantly the massive youth populace in order to circulate news and information on Government activities and schemes. The State Portal is likely to adopt and embrace the Technology with Social Media Presence as a future plan of action.

b. Change management strategy defined and status thereof

Changes have been dealt on following levels:

- Transition from manual system of workflow processing to electronic workflow processing: various general and project specific e-governance awareness and training initiatives have been taken to smoothly carry out the transition of employees and end users of new system.
- Change/improvement in various information systems implemented under e-governance program: A single point of contact has been identified for the

entire department to implement and authorize any change in the concerned information systems like IWDMS CMO, etc. This has resulted in smooth change implementation and better alignment of information system to department's requirement.

c. Capacity building plan and its implementation status

CMO places indepth efforts to formulate capacity building of its employees and ensure smooth implementation of various e-governance initiatives. Adequate provision has been made to provide training and build computer competency of the government employees. It encourages E-readiness at all levels for smooth operations.

Types of training provided:

- Basic computer training
- Gujarati Indic Training (typing in local language)
- IWDMS CMO, SWAGAT training to users
- Refresher training
- ISO Awareness Training

Highlights of training:

- User base divided into category based on Designation. Separate trainings carried out for Registry Clerks, GDC, DySO, SO, US, DS, JS.
- Content of the training designed based on participant designation.
- Minimum 2 hours of Training with question-answer session and 1 hour of hand-holding on computer with each user login into their account and exploring the actual functionalities of the system.
- Elaborative and comprehensive user manual designed in regional language for easy understanding of system process implementation.

Capacity Building at:

- Awareness Level
- Management Level
- Functional Level

d. Program Management Teams

CMO has defined and implemented those human and physical factors of the work environment needed to achieve conformity of administration and governance.

Consideration of these factors is identified during the administration and governance and process planning stage.

This includes:

- Positive environment;
- Work methods;
- Work ethics.

The C.M /Secretariats appoint a member as the Management Representative. Dr Hiren Joshi (OSD IT) has been appointed as the Management Representative. He is responsible to implement and maintain the quality system and various eGovernance Initiatives.

IV) Value Indicators (Optional Section)

1. Digital Inclusion

Steps taken to address this factor

Fully functional State Portal and website with G2C/G2B/G2G and G2E features.

2. eParticipation

Steps taken to address this factor:

- e-talking, sms and e-messaging
- Department Dashboards
- G2C features at State Portal and CM's website, e.g. Partake with Government, Swagat online, etc.

2. eWaste

Steps taken to address this factor:

- Paperless working (inter and intra office)
- Department Dashboard at CMO/on State Portal

Dr Hiren Joshi, Officer on Special Duty (IT) to Hon'ble CM, Chief Minister Office, Government of Gujarat, email: osdittocm@gujarat.gov.in

CHAPTER 10

Gujarat State Watershed Management Agency

Smt. Rita Teaotia and Shri Ram Kumar

I) Overview

The concerted, calculated and conscious efforts undertaken by the department in the direction of applying e-governance in the recent past have been remarkable and won appreciation from many quarters. The policies and strategies to make e governance happen have been put in place to the extent required. A dedicated manpower with the domain expertise have continuously supervised the entire process to ensure that nothing goes wrong and if at all some aberration occurs, corrective measures are taken on time. Feedback mechanism has been developed to take on board the outsider's opinion and accommodate the voices of the genuine ones. This has led to a better service delivery, a more transparent system and an improved problem solving scenario. It is all the more relevant given the erstwhile background when decision making was mostly subjective and arbitrary with no use of any DSS tool. Scant attention was paid to capacity building of the stakeholders. There was neither a proper monitoring system nor a strong institutional arrangement. Equity concerns like benefit sharing, beneficiary selection and conflict resolution were either completely ignored or dealt with on an ad hoc basis. Such scenario engendered lack of transparency and accountability. The abovementioned context necessitated a complete overhaul of the system and here came the e governance to salvage the situation. The ICT enabled benefits have been achieved in many sectors and one did not have reason to repudiate the same here in the department. The conviction was converted into action with

putting in place a robust and customized e governance system that led to desired outcome. The concrete benefits realized through the e system and the experiments done in the application of ICT by the department have to be made known to and shared with other stakeholders, institutions, departments, agencies. It will help ensure the wider acceptability and usability of such initiatives. Essentially and precisely, this has been the reason to nominate the entry.

The Gujarat State Watershed Management Agency (GSWMA), Rural Development Department serves as a State Level Nodal Agency (SLNA) to undertake Integrated Watershed Management Programme (IWMP) in the state. GSWMA is the key player in planning, strategizing and executing the innovative changes that have been brought about in the way Watershed Development Projects are managed. Being the State Level Nodal Agency (SLNA), it is responsible for obtaining sanction for IWMP projects from the Department of Land Resources, Ministry of Rural Development of the Government of India. After getting the projects sanctioned, it appoints Project Implementing Agencies (PIAs) for implementation of the projects at village level. At district level, its offices in the name of District Watershed Development Units (DWDUs) monitor the projects regularly. The PIAs are responsible for facilitation of works to be carried out primarily by the Village Watershed Committees. The major role played by GSWMA are as follows:

1. Provide technical support to District Watershed Development Units (DWDU) throughout the state
2. Prepare a perspective and strategic plan of watershed development for the state
3. Approve a list of independent institutions for capacity building of various stakeholders and planning for the same
4. Approve Project Implementing Agencies identified
5. Establish monitoring, evaluation and learning systems at various levels
6. Ensure regular and quality on-line monitoring of watershed projects in the state in association with Nodal Agency
7. Constitute a panel of Independent Institutional Evaluators for all watershed projects
8. Prepare State Specific Process Guidelines, Technology Manuals etc

Goals/Objectives of the ICT initiatives:

1. Prioritization and planning of watersheds across the whole state for a pragmatic and scientific assessment of whole area to be treated while at the same time integrating historical and future physical structures in the plan
2. Long term, scientific and need based holistic planning of each micro-watershed with mandatory provision for convergence with other relevant schemes/ departments/agencies
3. Participatory management where developmental planning, execution and monitoring was done with active participation of the community members integrating modern technology with traditional people's wisdom
4. Transparent and effective monitoring of the ongoing projects at field level

Economic/Social Agenda of the initiative:

1. Poverty eradication through natural resource management
2. Employment generation through livelihood support
3. Restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water in a holistic and sustainable manner
4. Demand driven and need based watershed planning with active participation of community members
5. Prevention of soil run-off and regeneration of natural vegetation with low cost technological solution complemented by indigenous knowledge
6. Rain water harvesting and recharging of the ground water table with inculcating a sense of conservation among the community
7. Enabling multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the project area
8. Promoting eco friendly and locally suitable activities with the required capacity building of the stakeholders

II) Result Indicators

1. Key Performance

a. Service Delivered (G2C, G2B, G2G, G2E)

Services are mainly delivered in the categories of G2C and G2E with primary focus on G2C. Compared to previous scenario, the service delivery mechanism in the present has proved time efficient and cost efficient.

b. Implementation Coverage

Table 1

Sr. No.	Year of Sanction	No. of Micro-Watershed Covered	No. of Villages Covered	No. of Projects	Total Area (in Lac Ha.)	Budgetary Allocation (in crore)
1	2009-10	1136	1099	151	7.08	930
2	2010-11	802	1101	141	7.21	927
3	2011-12	881	1135	138	7.12	922

2. Efficiency and Improvement Initiatives

a. Time and Cost Efficiency

Technically appropriate selection of project area & location of physical interventions: Identification and prioritization of most needy and critical areas throughout the state have been accomplished in a relatively short period of time. Below is the illustration of the priority map of the Dang district of Gujarat state where project clusters has been shown and the clusters are located in one of the most backward regions in terms of socio economic status and natural resources parameters:

Scientific prioritisation has resulted in selection of remotest and needy area in tribal district of Dangs which is one of the hundred most backward districts as per Planning Commission

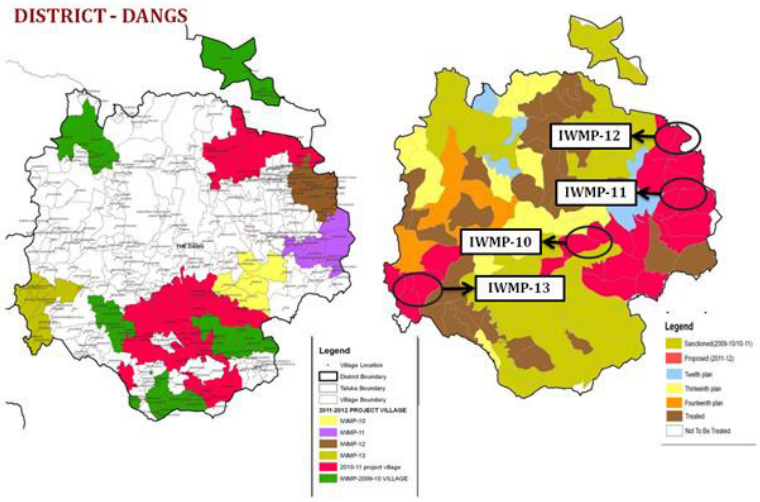
Scalability: Geographical Coverage – Gujarat State

Table 2

S. No.	Item	Details No.	Area (Lakh ha.)
1	Total micro-watersheds (MWS) in the State	13587	196.024

2	Total untreatable MWS (Reserved Forest, Barren Rocky, assured irrigation, etc.)			1005	27.2386
3	Total treatable MWS in the State			12582	168.7854
4.	*a. Total MWS covered under pre-IWMP schemes of DoLR*			3895	31.6302
	b. Total MWS covered under schemes of other Ministries			645	6.07954
	c. Total MWS covered under IWMP 2009-10 and 2010-11 of DoLR			1507	14.218
	d. Total of 4 a to d			6047	51.9277
5	Balance micro-watersheds not covered till date			6535	116.858
6	Plan for covering balance micro- watersheds	11th Plan	2011-12	881	7.12
		12th Plan		1842	39.7477
		13th Plan		1940	37
		14th Plan		1745	33
		Total		**6535**	**116.858**

Figure 1: Geographical Spread of the Project Services in Dangs



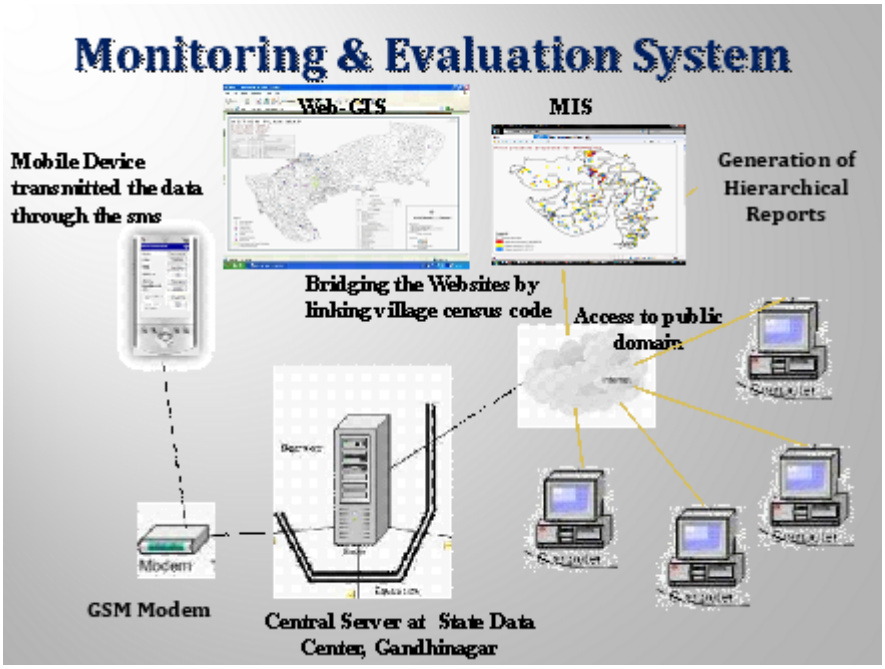
b. Innovative Ideas Implemented

1. GIS based prioritization on objective parameters and planning of watersheds was undertaken for the whole state resulting into a pragmatic and scientific assessment of whole area to be treated under the programme while at the same time integrating historical and future physical structures in the plan.

The Government of India has issued a reference to all states to follow Gujarat model for preparing DPRs under IWMP viz., letter vide No. Z-11011/ 20/2010-PPC Dated 7 September 2010 that validates the ample potential of the replicability of the approach adopted under the initiative.

2. GIS Based Monitoring: Use of GIS has been planned for the purpose of monitoring and evaluation of IWMP projects. Each WDT member of PIA will be allotted a unique code for their respective districts. Timely updating of the data regarding the project implementation on GIS maps will help in generating regular summarized and specialized reports for the decision makers. Data will be translated at State level onto GIS maps through which monitoring before, during & post implementation will become possible.
3. Additionally, Customized mobile based software is being developed in collaboration with BISAG (Bhaskaracharya Institute for Space Applications and Geo-informatics) which will enable updating maps through mobile text messages received from WDT's & incorporating GPS coordination. The process is represented in a diagram below:
4. Impact Assessment through remote sensing and GIS: The GSWMA has designed a rigorous impact assessment of projects. On completion of the project, impact assessment becomes essential. GIS will be used to map the environmental as well as social impact resulting from implementation of IWMP. Natural parameters such as ground water recharge, forest cover, salinity ingress, soil erosion and biodiversity will be studied through remote sensing and GIS. Also parameters such as crop pattern and irrigated area which have a direct impact on society can be studied. Analysis of data available from satellite images at regular intervals will help in generating an idea of the changes occurring in the baseline data due to implementation of IWMP. While detection of changes on the ground may be possible only after certain duration. Since IWMP is a long duration project, the assessment is feasible. Collection and analysis of data at regular intervals along with the mapping of project activities before, during and after implementation will create a very useful database which is at the core of any impact assessment process.

Figure 2: Monitoring & Evaluation System



III) Enabler Indicators

1. Department Policy and Strategy

a. eGov/ICT Vision Roadmap

1. Use of technology as a tool for transparency and improved planning at grassroots level.
2. Centrality of community participation and democratic processes right from the commencement of the project by holding village meetings through Gramsabha, Participatory Rural Appraisal exercises and execution of work through a democratically constituted Watershed Committee in the village.
3. Continuous Capacity Building at all the levels with special emphasis on the Watershed Committee for ensuring quality implementation and sustainability of the project.

b. Sharing of Common Infrastructure

State infrastructure for ICT is shared with the department.

c. Technology Standardization

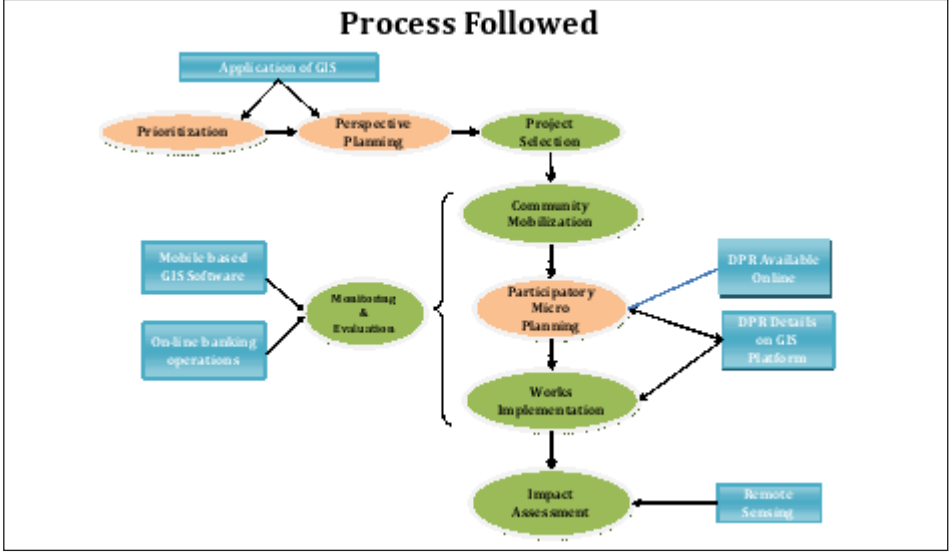
State specific Technical, Capacity Building and Human Resource Manuals and Operational Guidelines issued and enforced

2. Process Reengineering and Reforms

a. Major Non-ICT front-end Process Changes

To enhance the efficiency, transparency, accountability and effectiveness of IWMP, the systems and procedures have been automated to the extent possible. The difference between the new and the old approaches is given in the diagram below where one could see that new approach focuses more upon participatory planning with proper application of scientific tools like GIS and remote sensing as and when required. To ensure transparency and get feedback across board, the planning output i.e. detailed project report has been put in public domain. Vernacular hard copies have also been provided to VWCs.

Figure 3: Monitoring & Evaluation System



Colour code:

Pink: New approach;

Blue: New aspects;

Green: Traditional approach

E-connectivity has been provided in all its offices at different levels- from state to village level

3. Capacity Building

a. Leadership support & visibility and current status

There has been a constant support from the upper hierarchy at each and every stage of the conceptualizing, designing and operationalization of the initiatives.

b. Change management strategy defined and status thereof

Change management strategy:

- Institutional restructuring
- Team building at every level of the department
- Community and employee participation
- Application of technology to the extent possible
- Emphasis on capacity building of every relevant stakeholders

c. Capacity building plan and its implementation status

The whole process of capacity building has been standardized. A manual to this effect has been prepared and enforced. A consortium has been developed by empanelling 33 reputed institutions of different expertise. These institutions provide technological support and training programmes for skill enhancement. Regular capacity building programmes are under way to address the knowledge gap. Such programmes are aimed at all the relevant stakeholders within the department and targeted beneficiaries.

d. Program Management Teams

Yes. There is project team at every level. Team of domain experts work in unison and with community resulting into the successful execution and effective

coordination. Efforts have been made to professionalize the human resources by enlisting people from reputed institutes like IITs, IRMA, Anand; EDI, Ahmedabad, DA-IICT, Gandhinagar, XISS, Ranchi, etc.

IV) Value Indicators (Optional Section)

1. Digital Inclusion

Steps taken to address this factor:

- Availability of the services in the vernacular
- Capacity building for utilizing the services
- Documentation of the ICT application plan

2. eParticipation

Steps taken to address this factor:

- Citizens and Employees can send their feedback through e mail, SMS, ETC.
- The e governance initiatives exercises are shared electronically with the staffs and suggestions are accomndated

3. eWaste

Not Relevant.

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Chapter 11

Commercial Taxes, Government of AP: IT Initiatives in VAT Administration for Improved Transparency, Fairness and Tax Payers Services

Shri Suresh Chanda

I) Overview

CT Department, Government of AP endeavors to transform into an enterprise-friendly entity with greater transparency and achieve highest tax efficiency through use of Information Technology. As part of this vision accomplishment, department is providing Tax Payers Services through Online System in addition to other channels to give choice to dealers to opt for a service channel which is more convenient to him and also to reduce avoidable physical interface between citizen and tax office. These initiatives have brought in higher levels of convenience to tax payers, higher levels of satisfaction, reduced cost of service to citizens, reduced discretion in the hands of tax office in decision making, transparency in decision making, reduced scope for corrupt practices and reduced cost of service delivery for Government.

Commercial Tax department contributes more than 65% to the AP State Revenues. It is the biggest and main bread earner for the State. Main function of the department is administration of Value Added Tax, Entertainment Tax and Profession Tax. During 2010-11, it collected Rs. 32,800 Cr towards State Revenue. The State Excise Department stands at No. 2 with revenue collection of Rs. 7,5000 Cr. It has more

than 2.25 lakh dealers on its Roll.

Every month more than 2 lakh dealers visit department offices just to file their monthly VAT Returns and to make Tax Payment. Approximately, 3,000 new prospective dealers need to visit Tax offices per month for Registration. Approximately, 20,000 dealers visit every month Tax offices to apply for Statutory Forms like Waybills, C Form, etc. to transport their Goods. Every dealer, on average, has to make at least 3 visits to get these Forms. These processes were leading to too much of physical interface between Tax Payers and Tax Collectors along with its associated ills. Not only ills of physical interface, there was too much secrecy and scope for subjectivity in decision making and there were delays in delivery of service again leading to increased scope for corrupt practices.

By nature of its functions, Tax departments all over the country are highly prone to corrupt practices. Tax staff generally has lot of discretions in taking decisions. In view of this, these departments generally face complaints of harassment, corrupt practices, unfair treatments of tax payers, abuse of discretionary powers, etc. But in the recent past, there has been positive improvement in all these departments and now there are proactive initiatives to improve Tax Payers Services, reduce discretionary powers, simplify process, and improve transparency in decision making process and fairness in approach.

Government, by nature of its functions, is the biggest monopoly. Citizens has no choice but to approach Government for many services like Licenses, Registration Certificates, Permissions, Protection of Life and Property, Resolution of disputes through Courts, to name a few. This monopoly tends to reduce efficiency and effectiveness of Government services. Government does not feel the pressure of competition. But now that also is changing and Government can no longer ignore it as more and more citizens, with increased awareness, are demanding improvement in Government services.

Approach towards eGovernance

Within 'that' monopoly of Government, it is possible and feasible to eliminate or reduce such monopoly in many sub functions of the main function of the Government. For example, for issue of Statutory Forms, the sub functions like receipt of request applications and dispatch of Forms can be easily outsourced to multiple agencies to create options and choices for the dealer to create competition and thus improving quality of service. That

has been the primary approach for ICT initiatives. Further it is a well known fact that discretions in decision making, non-transparency in decision making and too much physical interface creates ground for corrupt practices and harassment. This is another main objective behind ICT initiatives.

In brief the objective behind ICT initiatives are, to the maximum extent possible, to provide options and choices to citizens to access Government services, reduce discretion, decision based on system-driven policies, reduced avoidable physical interface, services to citizens as per their convenience and move towards Online Service on 24X7 basis.

These initiatives will also bring substantial savings to citizens in terms of reduced cost of travel and time and also savings to Government in terms of reduced routine work in Tax offices. These initiatives will also improve the image of the Government and increase the satisfaction level of citizens towards its Government. The major ICT initiatives taken up are:

eRegistration and Central Registration Unit (CRU)

Prior to Reforms process, prospective dealer has to go to local Tax office only. To provide choice (Breaking monopoly) and additional channels for service (Increasing supply); initially Central Registration Unit was created at Hyderabad for all the areas coming under Twin Cities of Hyderabad and Secunderabad. Twin cities contribute more than 50% tax revenue. At CRU, dealer gets Registration Certificate on the same day without the need to visit the Tax office. In the next step, eRegistration facility has been put in place. Prospective dealer can file his application Online through Internet and he can send documents to Tax Office through Post. Registration Certificate is dispatched to dealer place through post. eRegistration has eliminated even the need for visiting CRU. Now Prospective dealer has choice (Breaking monopoly) as per his convenience to choose Tax Office or CRU or Online System (More channels – increased supply – smaller queue). Physical interface with tax office has been reduced.

eReturn

Every month more than 2 Lakh Tax dealers visit Tax offices just to submit Tax Return and Cheques. Facility was available during Tax Office Working Days and Working hours only. If the last date for filing Returns happens to be a sunday or a Holiday, the dealer has to file the Return one day in advance of the last date. Through eReturn

process, dealer can file his Tax Return through Internet from any place on 24X7 basis even on holidays and make payment Online through Internet Banking account. For dealers who still do not have access to Internet, they can file Tax Return through any eSeva center spread over all Municipal Towns in the State. The facility has also created for Sales Tax Practitioners (STP) to file Return on behalf of Dealers so that dealers who do not have their own IT infrastructure, can avail facility of STPs. This process has eliminated the need for more than 2 lakh dealers to visit tax offices every month. It has also helped Tax department. No need to enter more than 2.90 Lakhs Returns in computer every month. Earlier there used to be a lot of data entry errors in Tax offices committed by the Data Entry Staff. Now no errors, as Return is entered by dealer himself online. Even if we take average travel of 20 KMs per the dealer per month, it has eliminated more than 4.80 Crores Person KMs travel per year. Thus reducing not only Travel and Time cost for dealer, but also big benefit to society as a whole in terms of reduced traffic congestion on roads and reduced consumption of fuel by personal vehicles.

ePayment

It is a big boon to Finance department. If tax is paid through Cheque/DD, Government realizes Tax after, on average, 6 days. In case of ePayment, tax is realized by Government next day itself. Thus, there is improvement by 5 days.

Issue of Statutory Forms

Dealers for transporting goods from one place to another place require certain Forms like VAT Waybill, CST Waybill, C Form, etc. In the manual process, dealer need to apply to the local tax office. The service was available during Office working days and during working hours only. Issue of such Forms by the Tax office, has always have been a source of complaint from the trading community. General complaints are delay in issue of Forms, issue of lesser number of Forms forcing them to approach Tax office again and again and complaints of tax office staff demanding bribes. On average, 20,000 dealers per month approach Tax offices for 10 lakh Forms. As a first step towards reforms, a Centralized Computer Dealer Service Centre (CDSC) was created at Head Office. Dealers can file request online through Internet on 24X7 basis to this Center. The system will check the eligibility and indicate the number of Forms that can be given to a dealer. The Service provider (Third party) will dispatch Forms to dealer within 48 hours through courier. The entire process is completed without any interface with Tax

staff. The system is self-sustainable and does not require any budget support from Government. Service provider, who is selected on open tender basis, collects transaction charges from dealer to meet his expenses and courier charges. This system has eliminated altogether the need to visit Tax office for getting Forms. On average per month, more than 4.50 lakh (45%) Forms per month are delivered to dealer through this system.

eWaybill

As a next step to further improve dealer services, in this system, dealer will fill up goods transaction details for which he desires Waybill online and self-Print the Waybill. This service is also available to dealer on 24X7 basis. This service has even eliminated the need for dispatching Form through Courier and Form delivery to Dealer is instant. On average, more than 2.10 lakh (21%) Forms per month are being self-printed by dealers.

Information dissemination – Transparency

Correct and timely information is the key for transparency and fairness in administration. It strengthens the hands of citizen and makes staff accountable for its actions. A full-fledged portal puts citizen-centric information in public domain. In addition to that, the department has started putting all its orders on the Portal as soon as these orders are issued for the information of public. Earlier, order passed by the Tax authorities will be known to respective dealer and respective office only. Others will have no access to these orders. Orders passed by Tax authorities are quasi-judicial in nature. As such, department cannot take one stand in one case and another stand in another similar case. But in absence of transparency it is not possible to ensure such fair play. Once these orders are put in public domain, dealers can insist for such fair play. It will also make authorities accountable for their actions.

II) Result Indicators

1. Key Performance

a. Service Delivered (G2C, G2B, G2G, G2E)

1. Central Registration Unit (CRU) and eRegistration:

In manual mode, prospective dealer has to visit Tax office for submission of Registration application. It involved Travel as well Time cost to dealers. Under eRegistration, citizen can file Registration application Online and submit required documents through Post. Thus, avoiding on as average a minimum of 20 KMs of travel to and

from Tax office. At CRU, dealers get Registration Certificate on the same day. eRegistration has reduced data entry work at Tax office.

2. eReturn:

In manual mode, every month, more than 2 lakh dealers has visit Tax office for submission of monthly Tax Return. It involved Travel as well Time cost to dealers. Under eReturn, citizen can file Return Online on 24X7 basis. Thus, avoiding on average, a minimum of 20 KMs of travel to and from Tax office for each dealer. On average more than 4.8 crore Person KMs are avoided per year. Indirectly, it is also a big benefit to society as it has reduced pressure on Public Transport and Traffic on Roads. Each month the department has to enter more than 2 lakh Returns in computer system. There were many instances of data entry errors. With eReturn, there is no need to make entry of Returns at Tax office and no scope for data entry errors. Manpower cost savings to Government also.

3. ePayment

In manual mode, dealer will prepare Cheque, go to Tax office, Tax Office will capture details in Computer for generating Challan, send Cheque along with Challan to Treasury Bank, Bank will send Cheque to Other Bank for realization. Finally, the Bank will transfer amount to Government account and Challan confirmation details to department. This process involves huge routine work in Tax office and in bank. Government will realize the amount on average after 6 days from the date of submission of Cheque by the dealer. Under ePayment, dealer makes payment Online without visiting Tax office and information flows between Tax office to bank Online. No data entry work in Tax office and Bank. Government realizes revenue on next day of ePayment. Huge benefit to Government as time for realization is reduced from 6 days to 1 day. In the month of June 2011, Rs. 800 Cr was realized through ePayment. Soon it will go up to Rs. 2000 Cr per month. In financial terms, it will amount to financial cost saving of Rs. 50 lakh per month.

4. CDSC and eWaybill

In manual system, dealer has to make at least 3 visits to Tax office to get Statutory Forms. Thus spending time and money on travel. Under CDSC and eWaybill system, dealer files request Online and get Forms delivered at his door steps through courier

(in CDSC) and Prints Form himself instantly (eWaybill). Thus totally avoiding visit to Tax office. Savings in terms of Travel and time Cost for dealer. With eWaybill and CDSC in place, Tax office staff can focus on other important functions. Saving in manpower cost to Government.

b. Implementation Coverage

All the ICT initiatives are now available to all the dealers through the State of AP.

2. Efficiency and Improvement Initiatives

a. Time and Cost Efficiency

1. Central Registration Unit (CRU) and eRegistration

In manual mode, prospective dealer has to visit Tax office for submission of Registration application. It involved Travel as well Time cost to dealers. Under eRegistration, citizen can file Registration application Online and submit required documents through Post. Thus avoiding on average a minimum of 20 KMs of travel to and from Tax office. At CRU at Hyderabad, dealer gets Registration Certificate on the same day.

2. eReturn

In manual mode, every month, more than 2 lakh dealers has to visit Tax office for submission of monthly Tax Return. It involved Travel as well Time cost to dealers. Facility was also available during working days and working hours only. If the last day for filing Return happens to be a holiday, the dealer has to file the Return one day in advance. Under eReturn, citizen can file Return Online on 24X7 basis. Thus avoiding, on average, a minimum of 20 KMs of travel to and from Tax office for each dealer. On average, more than 4.8 crore Person KMs are avoided per year. Each month department has to enter more than 2 lakh Returns in computer system. There were many instances of data entry errors. With eReturn, there is no need to make entry of Returns at Tax office and no scope for data entry errors. Manpower cost savings to Government also.

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In manual system, dealer has to make at least 3 visits to Tax office to get Statutory Forms. Thus spending time and money on travel. Under CDSC and eWaybill system, dealer files request Online and get Forms delivered at his door steps through courier (in CDSC) and Prints Form himself (eWaybill). Savings in terms of Travel and time Cost. Further dealer will get Forms with a delay of 10 to 12 days. Under CDSC, Forms are dispatched to dealer within 48 hours and under eWaybill system he gets instantly. With eWaybill and CDSC in place, Tax office staff can focus on other important functions. Saving in manpower cost to Government.

b. Innovative Ideas Implemented

1. Uploading of Orders on Portal:

Earlier it was very difficult for the dealers to get a copy of the Department Notifications, Circulars and Orders timely. The only way for them to get copies was through Private Publications on Taxes. Now all orders and circulars issued by department are made available on portal as soon these are issued. Not only dealer has access to orders related to him but to all orders. Now he can represent if he finds that departments has taken different stand under similarly placed cases. It will bring transparency and accountability.

2. CDSC and eWaybill:

Earlier there used to be a lot of complaints from trade on delay, harassment and corrupt practices in issue of Waybills. Under CDSC, Waybills are provided to dealers

without any physical interface with Tax office and dispatch is within 48 hours. Under eWaybill system also, physical interface with Tax office has been eliminated. Dealer himself can print Waybill Online and service is instant. It has not only reduced service delivery time but, most important, it eliminated physical interface with Tax which is generally the cause of harassment and corrupt practices.

3. ePayment

ePayment option has reduced lot of routine work in Tax office and helped Government to realize Revenue on T+1 day as against earlier of T+6 days.

c. Integration with other Departments

Major interface of Commercial Tax department is with Treasury Department for realization of Revenue. Through ePayment system, Challan generation has been made online with treasury department. Now department is working for Online Verification of PAN data with Income Tax department.

III) Enabler Indicators

1. Department Policy and Strategy

a. eGov/ICT Vision and Roadmap

Vision: CT Department endeavors to transform into an enterprise-friendly entity with greater transparency and achieve highest tax efficiency through use of Information Technology. As part of this vision, department is now providing all Tax Payers services through Online System in addition to other channels to give choice to dealers to opt for a service channel which is more convenient to him.

b. Sharing of Common Infrastructure

CT department has its own Data Centre and WAN of 2 Mbps connecting all its Divisional offices and 256 Kbps for Circle Offices. As now AP SWAN capacity has been increased from 2 Mbps to 8 Mbps, it is planned to migrate Divisional offices to AP SWAN. Similarly as soon as State Data Centre is made operational, Critical Servers will be shifted to State Data Centre.

c. Technology Standardization

Department has not locked into any one technology. It is using Windows as well as

Sun Technology. Database is Oracle. But now it plans to migrate to SQL Server for cost advantage.

2. Process Reengineering and Reforms

a. Major Non-ICT front-end Process Changes

Legal changes have been carried out to facilitate eReturn and ePayment. Change in procedure for issue of Forms through CDSC and Online has been made.

b. Major Non-ICT back-end Process Changes

VAT software was initially implemented in 2005. Subsequently many Tax Payers Services related software has been developed with independent databases. Now it is planned to develop single software with single database. Software agency already identified and work of developing software started. It is likely to be completed in next 8 months.

3. Capacity Building

a. Leadership support and visibility and current status

Any Reform initiative requires support of all stakeholders more so top leadership. Support from top leadership is very crucial in getting required approvals, budget and legal changes carried out. Government provided all the required support at right time to accomplish the vision.

b. Change management strategy defined and status thereof

Tax administrations by and large are highly conservative and regulatory in nature and thus they resist any reforms and liberalization for fear of Revenue loss. Further, Tax administrations are known to be prone to corrupt practices because of inherent nature of job, high degree of discretion in taking decisions and secrecy. As such it creates vested interest in the system which tend to oppose any simplification in process, reduction in discretionary powers, transparency and liberalization. Hence it is important that all critical stakeholders namely Tax men, Tax payers are taken into confidence at every level of change contemplated. Tax men should not feel that Reforms and IT initiative are planned to take away their powers. Tax payer should realize early results of such initiative like improved convenience, fairness and reduced scope for harassment. Thus, strategy adopted was to create additional channel of services

without dismantling existing channels run by Tax men. Idea was to create choices for dealers. Let dealer decide which option is good for him. It helped in answering the fears of Tax men that IT is not planned to replace them. Bottom line is to provide improved services to dealers – whether through online system or through Tax office. Finally dealer should feel satisfied. It worked. It improved trust level between field Tax staff and higher administration. Meetings with Trade organizations and direct touch with dealers through email helped in creating right environment for early adaptation of IT initiatives. Once critical mass of dealers realized its benefits, it easily spread to others for adoption.

c. Capacity building plan and its implementation status

This department has been one of the earliest users of ICT in AP as long back as 1989. VAT software was launched in 2005. All the staff was given exhaustive training for making use of ICT initiatives. For creating awareness among dealers, meetings were held with Trade dealers. Citizen friendliness and ease of use was given high priority while developing Citizen Centric software. Maintenance of ICT infrastructure has been outsourced to third party.

d. Program Management Teams

There is full time Project Management team consisting of Department officials and Technical team from Institute of Electronic Governance and Centre for Good Governance.

IV) Value Indicators

1. Digital Inclusion

Steps taken to address this factor

The main Stakeholders for this department are Tax Dealers. Most of them have their own ICT infrastructure but there are many small dealers who do not have their own ICT infrastructure. To ensure that such dealers also take advantage of eInitiatives, dealers can take assistance of Sales Tax Practitioners, who are authorized by the department, to avail Online Services. In addition to this, dealers can also file their eReturns at any eSeva Centers. From the beginning this aspect was kept in view while designing, planning and implementing ICT project. If system is adding value to citizens, they are very eager to adopt these new initiatives and even willing to learn new IT-enabled processes.

2. eParticipation

Steps taken to address this factor:

The various important stakeholders in this initiative are, Dealers, Field Tax Staff, their Associations, Trade Organization, Media, Senior Tax Administration staff and Government. As Tax staff was taken into confidence at every stage and it was made very clear that purpose of Reforms and IT initiative is to improve service delivery to dealers through multiple service delivery channels, there was no expression of negative fears. Trade organizations gave highly positive support for these initiatives and also took initiatives to create awareness among dealers for early adoption of these initiatives. It helped in building positive critical mass very early. Media supported these initiatives by highlighting the advantage and taking awareness to large number of citizens. Government at every stage and at right time provided all the necessary approvals to make it happen. Department portal has provision for giving feedback. Special care is taken to answer dealers queries received through this channel. Many dealers gave very useful advice to improve the quality and reach of these initiatives. Their feedback was taken into consideration for making appropriate changes in software. It also encouraged them to give more feedback to improve system.

3. eWaste

Steps taken to address this factor

AP Technology Services, a Government of AP enterprise has identified third party vendors for safe disposal of eWaste. Recently this department has submitted list of eWaste for disposal through identified vendor.

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CHAPTER 12

Motor Vehicles Department, Kerala – Services through ICT

T P Senkumar and Alex Paul

I) Overview

Motor Vehicles Department is one of the departments of the Government of Kerala offering highest number of citizen centric services. The department was established in 1958. It is a major revenue earning department of the Government. All the 18 Regional Transport Offices, 65 Sub Regional Transport Offices, and 19 Motor Vehicles Check Posts have been fully computerized through the FAST (Fully Automated Services of the Transport Department) Project, and interconnected using Kerala State Wide Area Network (KSWAN), the first of its kind in the State of Kerala to have a wide coverage. Computerization of all the citizen services has helped the department in providing efficient and timely services with better transparency and quality to the citizens in spite of having acute shortage of staff. The major boost to the department was its recognition in the national level by awarding the CSI:Nihilent e-governance awards for the Best e-Governed Department in the year 2007-2008 at the initial stage of computerization itself. This has helped the department in implementing new and challenging innovative schemes.

The major reasons to submit this nomination are:

1. To get recognition of the department for the successful use of Information & Communications Technology in serving the public.
2. To recognize the efforts and confidence of all the department staff who accepted the new schemes.

3. To encourage the department officials to accept challenges in implementing e-Governance.
4. To get recognition and confidence of the citizens and to bring a new perspective of the Government services.
5. To promote cost-effective and open source e-Governance solutions.
6. To be a model department for other State departments in the e-Governance field.
7. To accept the support and encouragement of the department's technical solution provider, National Informatics Centre, Kerala.

Motor Vehicles Department is the only department in the country which has achieved 100% computerization of the services and implemented State Register and National Register.

The department believes that it has brought a new perspective before the citizens by the use of IT services in providing the department services and has greatly reduced the time and cost of the citizens for obtaining a service. Hence this nomination is submitted for the Best e-Governed Department.

The Motor Vehicles Department was established in the year 1958. The department is a line department of the Transport Department, Government of Kerala. All the services under Motor Vehicles Laws including those related to licensing of motor vehicle drivers and registration of motor vehicles is performed by the department. The department is headed by the Transport Commissioner and is assisted by the Joint Transport Commissioner and Senior Deputy Transport Commissioner. For the smooth functioning of its administrative and citizen services, the department has sub offices all over Kerala. There are 18 Regional Transport Offices, 65 Sub Regional Transport Offices, and 19 Motor Vehicle Check Posts. There are also four Deputy Transport Commissioner Offices in each zone (North, Central Zone-I, Central Zone-II, South Zone) to control the functions of the offices. The department was formulated with the objective of regulating the use of Motor Vehicles in public places and ensuring safety and efficiency in the transport system for catering to the needs of traveling public as well as transportation of goods for industries and agriculture. Collection of revenue for meeting the expenditure for the regulation of traffic and construction and maintenance of roads are also important objectives of the Department.

The services of the department can be broadly classified into three categories:

1. Citizen Services: Issue of licences, registration, permit and related works.
2. Enforcement Activities: Implementation of Motor Vehicles Acts & Rules, Control of automobile pollution, implementation of road safety measures and enforcement at border check posts.
3. Revenue Collection: Collection of vehicle tax, CESS, fees, compounding fees

All the services of the department were fully computerized as part of the FAST project and was declared Go Live in January 2007. All the services related to licences, registration, permits, number allotment, check reports etc have been automated through the SMART MOVE software.

The department has always strived to give better and faster services to the public. With the advancement of information technology, the department has been using these services to deliver promptly the needs of the public. People assess a Government by means of how the departments respond to the needs of the public. It depends upon the structure, uses of resources, decentralized mechanism, good procedure, routing of files, correctiveness in its day to day activities and avoiding delay in implementation. With the above priorities in mind, the department is working diligently and effectively through various e-Governance schemes.

The department has implemented the ICT activities using specifically the resources allocated by the Government of Kerala. Care has also been taken to develop the software needed for various computerization activities in open source platform thereby avoiding financial burden to the citizens to avail various services. The department has explicitly used the Government service delivery points like FRIENDS, Akshaya centres, mobile governance etc to deliver its services. By the use of Government schemes like Data Centre, Kerala State Wide Area Network etc. the department has definitely taken care that no extra cost is to be incurred by the Government or department.

Various G2C, G2B, G2E and G2G services have been implemented by the department. It is to be noted that the number of people coming to obtain the services of the department are increasing day by day with the growth of vehicle

population. The vehicle population in Kerala which was only 11.7 lakhs during 1996 has reached around 65 lakhs by the end of the year 2010. Implementation of various services with the help of ICT has helped the department to offer satisfactory services even with acute shortage of staff.

The technology-mediated process to modernize Government has brought in tremendous changes both in the method of delivery of public services and in the interaction between the Government and the public.

II) Result Indicators

1. Key Performance

a. Stakeholder services and benefits achieved through ICT interventions

1. G2C Services

The department has introduced submission of applications online for selected citizen services. This has made it much easy for an applicant to apply for a service. The applicant can select the service he needed and input only the relevant details like licence no. or registration no. After submitting the application, he is provided with the application forms duly filled in the prescribed format with barcode and an application id. The data entered online is readily forwarded to the Central Data Server and the same can be retrieved in the office by entering the application ID. The advantage of this system is that the applicant need not be bothered about which application form be submitted for a particular service.

- e-Licence Services:

a. New Learner's Licence	b. Licence Particulars	c. Change of Address	d. New Badge
e. Addition of new class	f. Duplicate	g. Change of Address (outside State)	h. Renewal

- e-Vehicle Services:

a. RC Particulars	b. Duplicate RC	c. Change of Address	d. Renewal	e. Hypothecation endorsement
f. Hypothecation termination	g. Transfer of ownership	h. No Objection Certificate	i. Re-assignment of Registration no.	j. Certificate of fitness

- e-Permit Services:

a. Fresh	b. Renewal	c. Authorization renewal	d. Transfer	e. Cancellation

- **Information Services:** Facility has been provided to the public for accessing various information in the department website **www.keralamvd.gov.in**, related to licence, vehicles, permits and registration numbers. The following services are offered:

a. Licence details	b. Vehicle details	c. Allotted numbers	d. Temporary registered vehicles
e. Mock test for Learner's licence	f. Booking status of reserved numbers	g. Tax calculation	h. Application status

- **Mobile Services:** As part of the m-Governance scheme of the Government of Kerala, the department is providing selected information services through mobile using SMS technology. Messages in specific format can be sent to the short code 53725/537252 for availing the services. The following services are offered:
  - Vehicle details: MVD V <vehicle no.>
  - Application status: MVD A <inward no.>
  - Permit Application status: MVD P <vehicle no.>
  - New Registration number: MVD N <inward no.>
  - Vehicle Tax: MVD T <vehicle no.>
  - Vehicle Number booking range: MVD F <office code>
  - Vehicle Number booking status: MVD F <booked no.>
- **Fast Track Services:** A new innovative venture of the department called FAST TRACK counters envisages providing instant services to the citizens through a single visit. The main features of this scheme are as follows:
  - Services are rendered only to those applicants who come directly. This has reduced the interference of agents and touts in the offices.
  - Services are delivered and disposed within 30 minutes of the submission of application.
  - Two counters at each office have been exclusively provided for services through this counter.
  - All the services like acceptance of fees, tax and application are done through a single counter.

- Facilities to take photos of the applications, if needed are provided at the counters.
- Documents are delivered by hand to the applicant after service on the same day itself.
- Selected services are only provided through this scheme:
- Driving Licence/Conductor Licence: Renewal, Change of Address, Licence Particulars, Duplicate (on surrender of original)
- Vehicles: Transfer of ownership (non-transport), Change of Address, Hypothecation noting, Duplicate (on surrender of original), Registration certificate particulars
- Permit: Motor Cab permit & Auto rickshaw permit renewal

2. G2B Services

Dealer login – The facility was introduced for dealers to enter directly the data related to vehicles for registration. This has reduced the workload of the employees to a great extent. On an average 80-100 vehicles are registered daily in an office. This caused delay in disposing the applications in time and data entry errors were frequent. With the introduction of this facility each dealer can enter the data of vehicles he is registering from his office. The data can be retrieved from the office by entering the application ID. It has also become much easier to accept fees and tax of the vehicles thereby making it possible to issue the registration certificate on the same day itself.

The Driving Schools are using the facility of e-licence services for submitting the applications of new learner's licence and for booking the test date and time of appearance.

Banks and financial companies can use the facility of e-services and m-services for verifying availed vehicle loans. This prevents the misuse of taking loans for the same vehicle from different financial institutions.

3. G2G Services

- **Enforcement login** – The department is giving G2G services to departments like Police, Excise, Sales Tax etc. by sharing information like details of licence, vehicles, tax details through e-services and m-services for enforcement

verification. Data is shared with other departments for verification purposes. The National Register for vehicle and driving licences has been made for the interconnectivity with other States also.

- **Common Service Centres** – Department is using the facility of common service centres like FRIENDS, Akshaya etc. for delivery of its services. Citizens can remit tax and fees for various services of the department through FRIENDS. Citizens who are not well-versed with internet technology can use the services of the Akshaya centres for submitting online applications.

4. **G2E Services**

- **Employee login** – Facility has been provided in the website for the employees to login and retrieve various statistical reports in the sub offices. This has reduced the time delay in obtaining various reports.
- **E-mail** – E-mail IDs have been provided to all the senior officers and offices of the department for instant communication. The department has used the facility of Kerala State Wide Area Network in achieving this. Important circulars and communications can be communicated through this facility.
- **SPARK** – The department has implemented Service Payroll and Repository of Kerala, a Government initiated web service application for payroll processing. This has greatly reduced the work load of the employees in matters related to process of pay of the employees.

Implementing the services through ICT has greatly reduced the time for disposing of services to the citizens. The facility of web services and m-services has reduced the time taken by the citizens to submit an application and knowing its status. Implementation of web services has given access to the services of the department to the citizens anywhere and anytime. In the conventional system, services which took more than 10 to 15 days on an average for processing and disposal, now takes only 2 or 3 days. The ICT services have also brought better transparency in the services of the department. With the facility of knowing the application status through web and mobile, a citizen can easily track the process of his application in an office without coming to the office itself. Submission of applications has also become very easy. Before the implementation of ICT services, a citizen had to fill up to 7 or 8 forms for some services and he was forced to take the help of agents and touts in filling the application forms. In the web service

system, he only needs to enter the necessary details, and a filled application form is generated automatically, which he can submit to the office with proper documents. Facilities like choosing the test date and time for appearing in Learner's Licence test or Certificate of Fitness test for vehicles has reduced the burden of the citizens to a great extent. The e-permit services recently started by the department have reduced the workload of the employees and also that of the taxi permit holders in the State. Earlier the application along with RC and other necessary documents had to be sent to the office of the State Transport Authority for process and then send back to the citizen through speed post. Now with online applications, these are verified at the respective RT Offices and the documents are returned then and there to the applicant. The details only are forwarded by web service to the head office for process and the permit certificates are sent by post to the applicant. Services like FAST TRACK Counter have given the confidence to the citizen to approach the offices without the help of agents or touts.

All the services of the department through ICT have been implemented in a cost-effective way by using the resources provided by the Government. Application software have been developed in open source platform. Connectivity has been got through the KSWAN provided by the State. The necessary technical solution and development of programs are being done through NIC. Hence, there is no extra cost incurred by the department and it has made possible to deliver the ICT services to the citizens without causing them much financial burden.

b. Implementation coverage till date and during the year:

The ICT services of the department are available throughout the State. All the offices have been computerized and are providing the citizen services through ICT only. Internet technology and mobile technology have made it possible for the citizen to avail the services of the department 24x7x365 days anywhere and anytime. The pilot run of the ICT services were done in selected offices of the department and necessary corrections were made. The program was then rolled out in all the offices of the department. At present 100% of the services are being delivered to the citizen using the ICT services only.

The department has taken active steps in implementing e-payment gateway to be integrated with the web services and will be rolled out shortly. At present, STQC certification, testing and trial run are being conducted.

In the enforcement area, the project Automation of Enforcement Wing proposes to achieve automation of the enforcement work of the department. Cameras have been installed in major junctions of the city and vehicle/licence details of any citizen who transients the motor vehicle laws and traffic rules will instantly be informed to the enforcement officers. Under this scheme, enforcement officers are provided with PDAs which will enable them to generate check report and compound penalty while on the move itself.

2. Efficiency and Improvement Initiatives

a. Time and cost efficiency improvements in delivering and availing of ICT enabled services:

1. The introduction of ICT based services has definitely reduced the time and cost of delivery of the services to the citizens. Services which had taken more than 10 or 15 days has now reduced to less than 5 days.
2. The ICT services have also enabled the department to give service with quality. Registration Certificates and Licence which were in book form and hand-written are now delivered in computer printed format and laminated.
3. With the use of ICT, the work environment in each office of the department has been utilized to maximum. Now there are less paper files to keep and hence the work area around the staff is fresh.
4. With the introduction of e-services, filling of application form has become easy. It can be done by anyone having a minimum knowledge of ICT or he can take the service of Government controlled CSCs. Only relevant data need be filled and this has saved the cost of application forms or service money which are to be given to the agents and touts.
5. The citizen can directly track the status of application through e-services or m-services and hence he need not come to the office often. The documents are sent by speed post to the citizen's address.
6. The employees need not do data entry and hence any service can be delivered in time. The data already entered by the applicant can be retrieved from the central server of the department.
7. Though the number of vehicles has increased considerably over a period of time, the department is able to deliver the citizen services in time due to

the adoption of ICT and hence the costs of appointing additional staff by the Government have been saved.

8. Wise use of resources provided by the Government have enabled the department to save considerable expenses that could have occurred in this field. The technical solution provider, NIC, being a Government of India body has developed the softwares for free of cost and thus no expenses have been incurred in this field.

9. Use of open source softwares have saved considerable amount for the department.

b. Specific innovative ideas implemented in eGov area; and their impact on services:

1. **FAST Project:** - Fully Automatic Services of Transport Department project was the first of its kind in the State to cover such a vast area in the field of computerization. The department offices all over Kerala were computerized with this initiative in a short span of time.

2. **Smart Move Software:** - The software was developed by the NIC by customizing the Vahan-Sarathi software. This is comprehensive software to automate all the citizen related services pertaining to licence, registration, and permits. Automatic allotment of registration numbers is a main feature of this application.

3. **Computer Aided Learner's Licence System:** - This module is coupled with the Smart Move and is used for conducting learner's licence test. It is an objective type test module and is available in English, Malayalam, Hindi, Tamil, and Kannada languages. This has made possible to issue learner's licence in a single day itself and at an average more than 80 candidates are able to attend the test.

4. **Any Counter Any Service:** - These counters were set up as part of the FAST project so that fees and tax for various services could be remitted in any of the counters instead of separate counters for a particular service. This has helped to prevent long queues and the citizen could get his services done without any delay.

5. **Fast Track Services:** - A new venture in which selected services can be processed and disposed off within a single day itself, if applicants come directly. This has helped the department offices more citizen friendly.

6. **Speed Post Delivery:** - With this facility, the applicants need to come to the office only once for submitting the application. The documents are then sent by speed post to the applicant. This has prevented the exploitation of the common public by agents and touts.

7. **E-Applications:** - In this the citizen need only enter his licence number or vehicle number for a particular service and the application form is generated automatically. An application ID is also incorporated so that citizen can track the status of the application.

8. **Test date booking for Learner's Licence and Certificate of Fitness:** - While submitting online applications for learner's licence or vehicle fitness, the applicants can choose the date and time for appearing for the test, and hence multiple visits to the office can be avoided.

9. **Dealer Login:** - This was introduced for facilitating the dealers to enter the data of newly registered vehicles from their office itself. This has enabled the acceptance of tax and fees of new registration vehicles easy and has become possible to issue the certificates on the same day itself.

10. **Online Permit Applications:**- This web service was started by the department recently. Instead of sending the RC and the applications to the head office by post, citizens can now submit applications at RT Offices and after scrutinizing the documents are returned to the applicant. The details entered by the RT Offices are then forward to the head office via web service for processing and the permits are despatched by speed post to the applicant directly.

11. **E-Kiosks:** - Touch screen kiosks have been installed at all the offices of the department for the public to access various information services without the assistance of office staff. Application status, tax calculation, change of driving test date, mock test for learner's licence, number allotment, number reservation, vehicle and licence information can be accessed through this facility.

c. To what extent the services are integrated with other departments

The data of the department is shared with the Police, Excise, Sales Tax etc. through enforcement login for knowing the details of vehicles and licence holders. Data is exchanged between FRIENDS Common Service Centres for facilitating acceptance

of fees and tax. Under the e-District project of the Government, the department data is shared with the Revenue Department for verification of address proof and identity.

III) Enabler Indicators

1. Department Policy and Strategy

a. eGov/ICT Vision and Roadmap

The department has a broad perspective on its future e-Governance initiatives. The department is always in the forefront to embrace the emerging technologies in ICT to deliver services through e-Governance. The major projects of the department are:

- **E-Payment:** - All necessary steps have been taken by the department to implement e-payment facility in the web enabled services. At present, auditing and testing of the applications is being done by STQC and department officers.
- **Electronic Document and Records Management System:** - The department has a database of over 65 lakhs of licences and 56 lakhs of registration certificates, voluminous number of permits etc. Though the applications are processed through computer, the necessary documents are being kept in paper form. This has led to piling up of the documents and difficulty to retrieve necessary papers. Hence, it has been decided to digitize all the paper documents and store it in a web server which can be retrieved online from any office.
- **Complaint and Query Management Systems:** - Road transport is a very vital area of public interest. To render help to the public an effective and efficient method of complaint management system needs to be implemented. In the present scenario complaints are received by means of letter or e-mail and there is no way for tracking the status of these complaints. An automatic CQMS will allow the citizen to track the status of complaints and bring transparency and speed in disposing the complaints.
- **Web Application Software:** - At present, the department is using the client-server model of the Smart Move software to deliver computerized services

to the citizens. It is proposed to develop a web application software having a common database to avoid duplication of records and can be accessed and processed via online. This will also bring the concept of a single RTO.

b. Sharing of Common Infrastructure

The department has taken care to utilize the resources and channels provided by the Government to maximum use. Connectivity between the offices have been established through Kerala State Wide Area Network. The front end of the web site has been developed in the open source content management system 'JOOMLA' and the back end has been developed in open source platforms using PHP and PostgreSQL. Common Service Centres like FRIENDS, Akshaya are being utilized for service delivery. Government schemes like m-Governance are also being used to deliver services to the citizens. Sharing of data with other departments is also done through KSWAN.

c. Technology Standardization

The department has decided to implement all its e-Governance schemes using the resources made available by the Government and to use open source platforms for software development. This is clearly evident in the ICT services already implemented.

2. Process reengineering and Reforms

a. Major Non-ICT front end Process Changes

1. Implementation of web enabled services and e-application form.
2. Facility for tracking the status of application through e-services and m-services.
3. Despatch of processed applications through speed post.

b. Major Non-ICT back end process changes

1. Implementation of e-applications.
2. Data synchronization between RTO and central server using the KSWAN connectivity.
3. Capacity Building.

3. People and Resources

a. Are the Program Management Teams there full time; (department officials/ consultants)

The department's IT team, Smart Support Group is constituted with IT interested officers. They provide full support and suggestions in implementing various e-Governance schemes. The major functions of the team are:

1. Examine and enable formalization of changes required in the departmental process and review the progress of implementation of process re-engineering and change management.
2. Evaluation of progress of implementation of the e-governance schemes.

b. Capacity building plan and its implementation status

Training is being given to the employees during the implementation stage of e-Governance activities. Vehicle dealers and driving school owners are also given training for the use of e-applications. Master trainers are selected from the department staff for giving training. National Informatics Centre also gives requested training programs to the employees.

c. Change management strategy defined and status thereof

1. Employees and citizens have been given better ambiance. The office work environment has got a new look. Provision for drinking water and seating facility has been provided in the offices.
2. Centralization of data has enabled to deliver information 24x7x365 days through multiple channels. Sharing of data with other departments are also possible.
3. Concept of e-application forms has greatly reduced the burden of the citizens in filling data repeatedly.

d. Leadership support & visibility and current status

The Transport Commissioner along with Joint Transport Commissioner leads the overall implementation of the projects. The department's IT team called the Smart Support Group manages monitors and implements the various e-Governance schemes.

The technical solution provider of the department, National Informatics Centre, Kerala provides full support and suggestions on the e-governance schemes. The Service Provider of the FAST Project, C-DIT supports and maintains the ICT equipments in all the offices.

Recently the department has started its own Software Development Centre, Software Testing Centre, and Software Training Centre. The software development centre and testing centre has been equipped with latest and advanced servers and ICT equipments for developing and testing the web enabled software of the Smart Move software. In the training centre, it is proposed to conduct regular training for various e-Governance activities. The centre has been equipped with internet connection and latest computers for giving hands on training to the existing employees as well as to the new recruitments.

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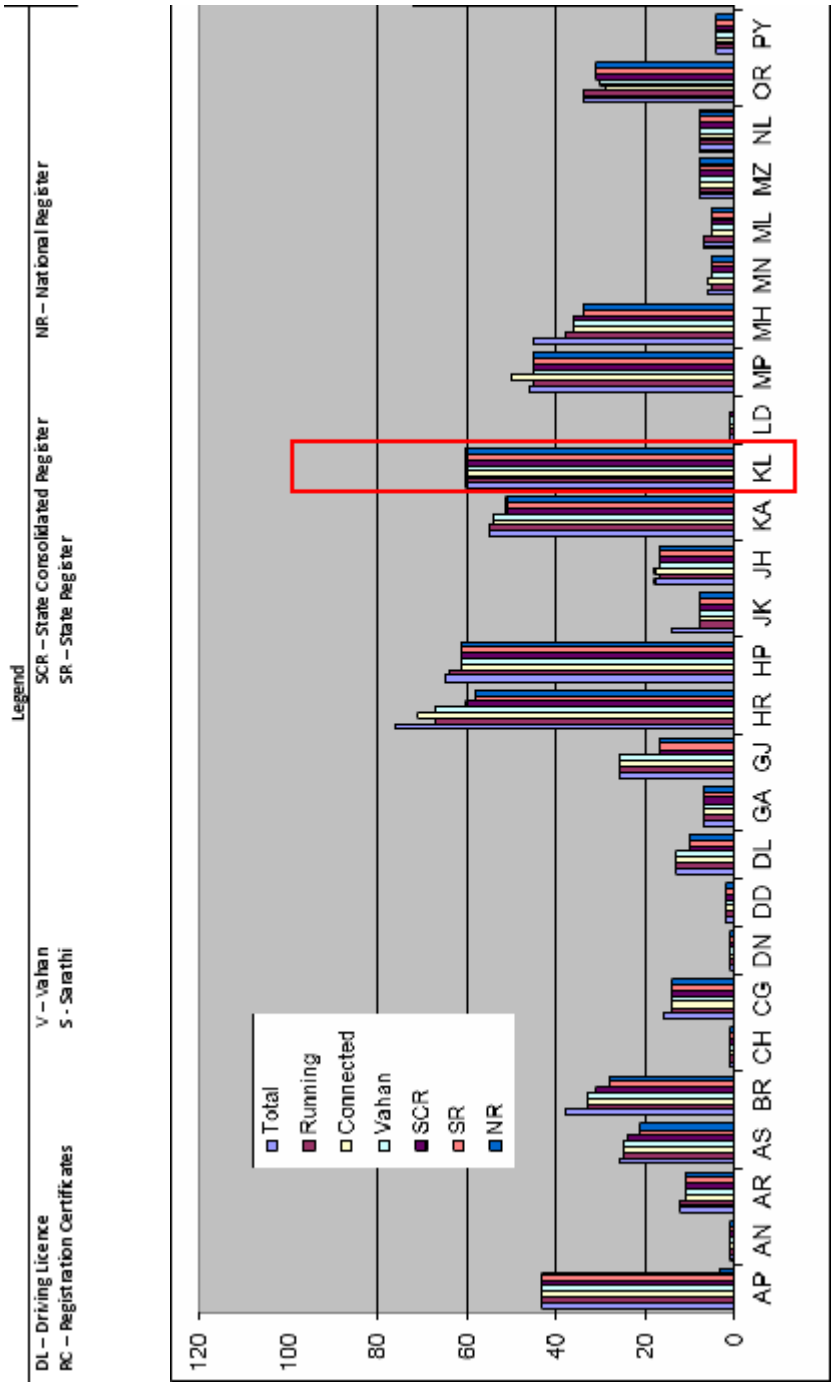
Annexure - I: Details of computerization and Database Connectivity of Motor Vehicles Department in India – as on 31.12.2010

SL	State/Union Territories	Code	Total sites	Total Sites		Running		Connected		Sites for ODI		No. of Sites						% of completion					
												SCR		SR		NR		SCR		SR		NR	
				DL	RC	V	S	V	S	V	S	V	S	V	S	V	S	V	S	V	S	V	S
1	Andhra Pradesh	AP	43	43	43	43	43	43	43	43	43	43	43	43		3		100	100	100	0	7	0
2	Andmans	AN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	100	100	100	100	100
3	Arunachal Pradesh	AR	12	12	12	12	11	11	11	11	11	11	10	11	1	11		100	91	100	9	100	0
4	Assam	AS	26	26	26	25	25	25	25	25	25	24	21	21	3	21		96	84	84	12	84	0
5	Bihar	BR	38	38	38	33	36	33	32	33	32	31	25	28		28		94	78	85	0	85	0
6	Chandigarh	CH	1	1	1	1	1	1	1	1	1	1	1	1		1		100	100	100	0	100	0
7	Chattisgarh	CG	16	16	16	14	14	14	16	14	14	14	14	14	12	14	12	100	100	100	86	100	86
8	Dadra and Nagar Haveli	DN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	100	100	100	100	100
9	Daman and Diu	DD	2	2	2	2	2	2	2	2	2	2	2	2	1	2		100	100	100	50	100	0
10	Delhi	DL	13	13	13	13	13	13	13	13	13	10	1	10		10		77	8	77	0	77	0
11	Goa	GA	7	7	7	7	1	7	7	7	3	7	3	7		7		100	100	100	0	100	0
12	Gujarat	GJ	26	26	26	26	26	26	26	26	26	17		17		17		65	0	65	0	65	0
13	Haryana	HR	76	76	76	67	67	71	67	67	67	60	9	58	1	58		90	13	87	1	87	0
14	Himachal Pradesh	HP	65	65	65	64	64	61	63	61	63	61	51	61	13	61		100	81	100	21	100	0
15	J&K	JK	14	14	14	8	9	8	8	8	8	8	8	8	1	8		100	100	100	13	100	0
16	Jharkhand	JH	18	18	18	17	16	18	18	17	16	17	15	17	1	17		100	94	100	6	100	0
17	Karnataka	KA	55	55	55	55	52	54	53	54	52	51	51	51	42	51	42	94	98	94	81	94	81
18	Kerala	KL	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	100	100	100	100	100	100
19	Lakshadweep	LD	1	1	1	1	1	1	1	1	1	1						100	0	0	0	0	0
20	Madhya Pradesh	MP	46	45	46	45	45	50	45	45	45	45	45	45	45	45	45	100	100	100	100	100	100
21	Maharashtra	MH	45	38	45	38	45	36	39	36	39	36	9	34		34		100	23	94	0	94	0
22	Manipur	MN	6	6	6	5	6	6	6	5	6	5	4	5		5		100	67	100	0	100	0
23	Meghalaya	ML	7	7	7	7	7	5	5	5	5	5	5	5	4	5		100	100	100	80	100	0
24	Mizoram	MZ	8	8	8	8	8	8	8	8	8	8	8	8	1	8		100	100	100	13	100	0
25	Nagaland	NL	8	8	8	8	8	8	8	8	8	8	8	8	1	8		100	100	100	13	100	0
26	Orrisa	OR	34	34	34	34	34	29	28	30	28	31	31	31		31		103	111	103	0	103	0
27	Pudicherry	PY	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	100	100	100	100	100	100
28	Punjab	PB	72	72	72	33	31	24	31	32	31	25	4	23	2	23		78	13	72	6	72	0
29	Rajasthan	RJ	38	38	36	37	11	37	37	37	11	37	11	37		37		100	100	100	0	100	0
30	Sikkim	SK	4	4	4	4	1	4	4	4	1	4	1	4	1	4		100	100	100	100	100	0
31	Tamil Nadu	TN	110	110	110	110	110	110	110	110	110	107	107	106	56	105	53	97	97	96	51	95	48
32	Tripura	TR	5	5	5	5	5	5	5	5	5	5	5	5	1	5		100	100	100	20	100	0
33	Uttar Pradesh	UP	73	72	73	72	0	70	0	70	0	70	NA	70	NA	70		100		100		100	
34	Uttarakhand	UK	14	14	14	14	14	14	14	14	14	14	14	14	13	14	13	100	100	100	93	100	93
35	West Bengal	WB	26	26	26	24	9	24	24	24	NA	24		24		24		100		100		100	
	Total	35	975	966	973	898	781	884	816	882	754	848	572	834	265	793	231						


Legend
DL – Driving Licence
RC – Registration Certificates
V – Vahan
S - Sarathi
SCR – State Consolidated Register
SR – State Register
NR – National Register
Total
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AP AN AR AS BR CH CG DN DD DL GA GJ HR HP JK JH KA KL LD MP MH MN ML MZ NL OR PY

CHAPTER 13

Health Management Information System, Tamilnadu

Dr. S Vijayakumar

I) Overview

The Tamilnadu Health Department works for the cause of a healthy population through a system of Medical College Hospitals, District Hospitals and Public Health Centers arranged in a three tier system. Tamilnadu Health Systems Project under the department of Health and Family wrelfare, Government of Tamilnadu, caters to the upgradation Primary, Secondary and Tertiary Care hospitals in the State.

The system lays special emphasis on reaching out to the poor, disadvantaged and tribal groups. Health Management Information System "HMIS" is a judicious combination of Information Technology (IT) and management systems, to deliver improved evidence based health care to the public at large. Health Management Information System provides information-based support for the implementation of cutting-edge reforms by the Tamilnadu Health Systems Project. Apart from Primary health centers, Secondary care hospitals, this project is envisaged to include all the tertiary care hospitals including the Medical colleges.

IT enablement of hospitals in the Tamilnadu districts will create an accurate real time database which can be then used as a basis of timely information for drawing up health-related policies and budgets by the State bureau. This initiative strives to strengthen the patient and the hospital database such that it ably supports the strategic management of the health system of the state. The easy

access to epidemiological data about individual patients enables proactive and efficient management of communicable and non-communicable diseases. This is very effective and result-oriented during the eventuality of an epidemic.

Early intervention and swift response by the health directorates, guided by accurate information would aid in handling emergencies and such other situations. The Health department of Tamilnadu is not only providing for quality health care but also ensuring infrastructure support to sustain this care.

Critical parameters captured and made available in **real-time**, across the health chain, distinctly aids quality and timely decision making by the health directorates. Implementation of health schemes has significant financial implications. Thus the HMIS project being implemented by the Health department of Tamilnadu for IT enablement of the hospitals. The ambitious project was conceptualized to provide the critical health data across the health chain for quick and timely intervention by the health directorates.

The project includes the development and implementation of Hospital automation of Primary, secondary care institutions, Tertiary care hospitals, Govt Medical Colleges & a Medical University across the state and a State wide Health IT network for reporting on a uniform reporting platform. All the critical parameters are captured at the end user level and made available real time across the health chain for decision making

HMIS is a judicious combination of Information Technology (IT) and management systems, to deliver improved healthcare to the common man. Critical parameters captured and made available in real-time, across the health chain, distinctly aids quality and timely decision making by the health directorates. In addition to administrative benefits experienced by the hospitals and enhanced patient-experience in follow-ups, the state-run programmes like Blindness Control, Malaria, TB, Infectious diseases, School Health etc. gain access to accurate and current data which gives a fillip to the success of the programmes.

Implementation of health schemes has significant financial implications. The objectives of HMIS include improved financial control of the various schemes. Efficient data handling of patients, equipment inventory, drug stocks and such other related entities, controls costs and avoids unnecessary wastages.

Compliance with International Classification of Diseases-10, is essential to carry out qualitative analysis of the diseases and health problems of a large population. HMIS eases this process and gives the Tamilnadu Health Care system a significant leverage in efficient management across the entire state.

The Government health care delivery covers a population of over 7.21 Crores (2011) in the State of Tamilnadu (in all 32 districts) through 19 Tertiary Care Institutions under Directorate of Medical Education, 267 Secondary care hospitals under the control of the Directorate of Medical Services and 1539 Primary Health centers under the Public Health Directorate.

The HMIS application is envisaged as a single State Health IT system. A totally centralized web based system on fully open source technologies was decided upon to optimize investments and more importantly, overcome the maintenance and skills availability at district/hospital level.

It has two components namely:-

HMS (Hospital Management System)

1. Registration-OP/IP/casualty
2. Clinical module for OP record/IP record/Nurses notes, Operation notes/ discharge summary/ ANC record etc.
3. Reporting of the lab test results online
4. Online indents and issues (for drugs)
5. Online ward transfer/linen/diet/BMWM
6. Online day end/periodic report generation
7. Final disease diagnosis is mapped to ICD-10

And

MIS (Management Information System)

1. Clinical module (as above-Auto populate)
2. Ancillary-reporting forms-Blood Bank, stores, diet etc
3. National Programmes – Blindness control, Malaria, TB, Infectious diseases, School Health

4. Administrative Information – HR issues
5. Security module handles all the access and privileges to be given to end users for each
6. Application and reporting.

An University Automation system for Tamilnadu Dr. MGR Medical University and College Management system has been devised for University & Medical College activities.

This is devised to capture real time online data on patients and hospitals in 267 hospitals in 32 districts across the state of Tamilnadu. Health management information from 1539 Primary health centers, 19 medical colleges, 47 DME institutions.

While TCS provides the software solution support, the connectivity is provided by Electronics Corporation of Tamilnadu using a 2 mbps leased line. The vendor-independence of the software and fail-proof connectivity make the system a robust one. So, this system can be successfully deployed across all the hospitals—whether it is in an urban area, a village, or a remote location, independent of the volume of patients handled by it. The simplicity of the interface enables the use of the application directly by the end-users without any assistance from operators.

Implementation of HMIS has been treading zones where no one had ever gone before. Gujarat had a system, but that was data entry operators putting information into the system. This is a real time online loading of data and its success is dependent on the cooperation of the staff. By implementing this system we have fixed accountability and responsibility on the individual health care providers.

Project Data:

HMIS the flagship Tamilnadu Health System Project was implemented in a phased manner. Started as Pilot (during the year 2008), followed by Phase–I (during the year 2009), Phase-II (during the year 2010) and finally Phase III levels (2011). Amount spent for pilot implementation

Table 1:		
Sl.No	Stage	Amount Spent through TNMSC and ELCOT
1.	Pilot	**Rs.2,88,15,000/ and Rs.18,33,250/-**
2.	Phase I	**Rs.5,01,84,000/-**
3.	Phase II	**Rs. 87,85,28,697/-**
4.	Phase III	**Rs.23,05,05,792/-**
	Total	**Rs. 118,75,46,739 + Rs. 50,00,000** *(Rupees One Hundred and Eighteen Crores Seventy Five Lakhs Forty Six Thousand Seven Hundred Thirty Nine Only)*

II) Result Indicators

1. Key Performance

The HMIS project has several stakeholders – Patient, Doctors, Health Administrators and the service providers in hospitals.

Benefits to patients

1. Online health record available for easy retrieval by doctors in subsequent visits
2. Time saved with access to doctor directly instead of registration for follow up visits

Benefits to Government / Health Administrators

1. Quick and easy retrieval of data – real time data across hospitals/districts available online
2. Close monitoring and follow up easier with data available online
3. Better inventory and human resource management
4. Capability to analyse trends and disease patterns
5. Evidence based decisions for investments, improvements
6. Savings in terms of paper and records maintenance
7. Referral chain and patient movement
8. Easy consolidation of data – for comparison, validation, etc.

Benefits to hospitals/staff

1. Time saved for reports and data consolidation
2. Quicker and easy retrieval of records

3. Single point of data entry – at end user level
4. Uniform and standardized reporting formats across the Health chain
5. Near real time data available – for monitoring, decision making across the health chain
6. Reduced/minimized duplication of data entry and data maintenance
7. Automatic consolidation/collation of data
8. In-built validations for data entry – reduction in data entry errors
9. Master data entry forms – standardized to bring in uniformity in reporting

HMIS is a solution that encompasses technology, procedures and people with a focus on providing timely and accurate information to micro manage at operational level and aid decision making at policy level. This solution aims to increase process and quality outcomes and decrease inefficiencies and costs. This would help control administration costs and maximize efficiencies of available resources. Acknowledging this, the initiative was awarded the "e-India 2009 award for category e- Health – Best Government initiative/policy for the year 2009" at the e- India event, held at Hyderabad during August 25-27, 2009. Selected for Final round National E-Governance Award awarded by department of Administrative Reforms and Public Grievances, Ministry of Personnel, Public Grievances & Pensions, Government of India.

One of the important measurable outcomes of the HMIS implementation is that approx. 60% of the registered patients bring back the PIN (Patient Identification Number) during their subsequent visits, which shows high patient compliance to this system.

By implementing this system we have fixed accountability and responsibility on the individual health care providers. The results are clearly indicating the success

1. 267 secondary care Government hospitals + 1539 PHC's online
2. Real time data 24x7
3. The Usage details since December 2008

2. Efficiency and Improvement Initiatives

a. Time and cost efficiency improvements in delivering and availing of ICT enabled services:

Table 2:

HMS USAGE STATUS	
MODULE NAME	**COUNT**
TOTAL REGISTRATION	**7705760**
TOTAL NO.OF PATIENTS VISITED	**12802986**
TOTAL CLINICAL VISIT	**6300562**
TOTAL LAB REQUEST	**3646137**
TOTAL PHARMACY ISSUE	**4938297**
TOTAL IP PATIENTS	**312750**

1. All the processes and data capture fully paper based and all records maintained manually at the hospital - resulting in time consuming process for transfer/retrieval of records, and collation/consolidation of data for reporting.
2. Substantial Government funds spent on printing of Registers for record keeping.
3. Duplication of records/data entry – eg. Patient demographics including name, age, sex to be entered in each register/record; and no records maintained by hospital for patients treated in Outpatient department.
4. Inconsistency and variations in health care data received from hospitals/ districts for analysis.
5. No snap shot/dashboard view available to monitor the performance of the hospitals on real time basis for health administrators.
6. No uniform and proper maintenance of details for Equipment, Personnel, Drugs inventory, at hospitals/administrator levels.
7. Limited mapping facility for Inpatient records to Disease classification (International Classification of Diseases (ICD-10)) at hospitals.

The end users across various Institutions and offices were called upon for finalizing the software requirement specifications, so that the entire application was customized to suit the needs of each and every department. TNHSP judicially chose an Open Source software stack in order to prevent a vendor lock in state, in case the project needs to be up scaled. Extremely simple, user friendly screens designed by application provider to ensure end user ease of use and optimized for performance.

Adequate training for the end users at the Institutional level, to ensure the full participation and to increase the comfort level of the end users. Hassle free connectivity through Tamilnadu State Wide Area Network (TNSWAN), which is a 2 Mbps dedicated leased line terminating at each hospital level. A Broadband Connectivity of 2 Mbps connectivity has also been setup at all hospitals as a redundant connection. We have also established Automatic switch over from TNSWAN to broadband and vise versa during times when either one of them fails. A centralized web server which houses all the database placed at a fully equipped Tamilnadu State Data center maintained by ELCOT.

TNHSP in coordination with Tamilnadu Electricity Board has ensured that there are no power cuts during the Out patient hours of the hospitals. We have also supplied UPS with 2 hours back up to all the hospitals in case of a power failure. TNHSP has requested the State Government to issue necessary orders to do away with the manual registers subsequently Govt Order number (MS)10 dated 14.01.2011 was issued by Health and Family Welfare department, Govt of Tamilnadu, this had enabled all the hospital staff to eventually use HMS for all the transactions.

Continuous motivation of all the end users from the top level of the management and a daily review of the performance of the hospitals on HMS at the Directorate level ensured that the implementation was a success. Creation of a "Centralized Help Desk" to register calls/clarify queries from end users regarding hardware/ application related issues, which will also ensure coordination among various stakeholders. TNHSP has posted an IT Technical coordinator at each district for the 32 districts to supervise, troubleshoot and handhold the various issues occurring at the institutional level.

b. Specific innovative ideas implemented in e-Governance area; and their impact on services

1. Unique Patient Identification Number (PIN) - helps in Referral and easy retrieval of Patient data
2. Standardized and Unique codes across all government hospitals; and employees of the Health Department
3. Usage of standardized State level drug codes from Central procurement

agency & Treasury codes for Finance related information

4. Uniform and standardized reporting formats across all institutions for ease of comparison, data analysis among Health Directorates.
5. Online availability of patient health records across referral chain.
6. No Data entry support by ensuring the end users themselves trained for online usage of the system - OP record entry by doctors online including online prescriptions, lab investigations, diagnosis.
7. Issuance of Government orders - removal of manual registers; process changes at hospitals (eg. Drug tokens, lab slips removal) and use of the online HMS.
8. Rationalization of manpower and processes

c. The extent to which this e-Governance initiative is integrated with other internal and/or external ICT systems

Optimal utilization of existing IT infrastructure investments by the State including Wide Area Network, State Data Center

Guided by the objective to improve efficiencies at the global level and leveraging the prolific presence of technology, rationalization of some processes, inputs and reports have been done. This has led to removal of many manual processes including manual tokens for drugs, lab request slips, indent forms, etc. and automation of periodic reports on drug issues, indents, daily census, etc. resulting in substantial saving of time for the end users. Grass root level study of information requirements and processes has facilitated the design of uniform and standardized input formats and processes. Common uniform system of reporting will ease data comparison and performance monitoring across institutions. Proactive Health programmes can now be tailored to meet the local challenges. The abstract of the innovations brought about by the project are as follows:-

1. Unique Patient Identification Number
2. Unique Institution codes across all government hospitals and office
3. Unique employee numbers/user names and password-for access to system
4. Re-use of drug codes (from other central procurement agency)

5. Re-use of the treasury codes for finance related information
6. Uniform and standardized reporting formats across all institutions
7. TNHSP will propose to link the PIN to the UID that is to be developed by the government of India.
8. The Lab test results are being given to the patients with test report reference values
9. The final disease diagnosis is linked to International Disease Code-10

Basic Computer training to all the hospital staff were arranged with the help of Tamil Nadu e Governance Agency (TNeGA). The doctors themselves enter diagnosis, order lab tests and give prescriptions online for all out patients. As a result, no manual records are maintained any longer. Posting of an exclusive District IT Technical Coordinator, to maintain the systems inventory and to attend to local hardware/network issues ensures minimal downtime.

Top management support has also played a critical role in the successful deployment of the application. Continuous motivation of all the end users from the top level of the management and a daily review of the performance of the hospitals on HMS at the Directorate level ensured that the implementation was a success.

As mentioned earlier, at the behest of the Director of Medical and Rural Health Services facilitated by TNHSP, the State Government has supported this project by way of issuing a **G.O** instructing hospitals to do away with manual registers and make full use of HMIS application. Also, HMIS was conceptualized as a centralized web based software solution to minimize technology support and maintenance dependencies

III) Enabler Indicators

1. State Policy and Strategy

One among the Secondary care hospitals where this web-enabled system had been established – the Namakkal Govt Hospital had received NABH accreditation. The vendor-independence of the software and fail-proof connectivity adds value to the system. Hence this is successfully deployed across all the hospitals—whether it is in an urban area, a village, or a remote location, independent of the volume of patients handled by it. Government had issued

orders to do away with manual records and all hospital related entries are done online. By principal government had issued orders for the implementation of State Health Data resource center, which will serve as a central repository for all the data received through HMS and HMIS.

The various Government orders are as follows:-

1. **G.O.2D No.68 Health and Family Welfare Department Dated: 29.08.2005** (*Hiring of a consultancy firm to develop and implement a comprehensive HMIS for secondary level hospitals).*
2. **G.O.2D No.62 Health and Family Welfare (EAP 1/1) Department Dated: 06.06.2007** *(Hiring of a consultancy firm to develop and implement a comprehensive HMIS for secondary level hospitals – Expenditure Sanctioned).*
3. **G.O.(Ms) No.223 Health and Family Welfare (EAP 1/1) Department Dated: 08.07.2008** *(Implementation a comprehensive HMIS for secondary level hospitals- Pilot Phase – Procurement of Hardware components and connectivity, etc).*
4. **G.O.2D No.87 Health and Family Welfare (EAP 1/1) Department Dated: 29.07.2008** *(Implementation a comprehensive HMIS for secondary level hospitals).*
5. **G.O.2D No.37 Health and Family Welfare (EAP 1/1) Department Dated: 18.05.2009** *(Implementation of comprehensive web based HMIS including HMS and patients electronic medical records – Implementation in 270 hospitals in the State – Procurement of equipment for Phase I hospitals Sanction of additional funds of Rs.3,47,26,930/-).*
6. **G.O.2D No.80 Health and Family Welfare (EAP 1/1) Department Dated: 20.10.2009** *(Implementation of web based HMIS and HMS in Phase I project hospitals – Provision of TNSWAN connectivity – proposal approved – Sanction of expenditure of Rs. 1,56,66,521/-).*
7. **G.O.2D No.87 Health and Family Welfare (EAP 1/1) Department Dated: 21.10.2009** *(Provision of computer furniture to the hospitals supplied with the computers - Proposal approved – Sanction of expenditure of Rs. 10 Lakhs).*
8. **G.O.2D No.88 Health and Family Welfare (EAP 1/1) Department Dated:**

21.10.2009 *(Implementation of web based HMIS and HMS in all project hospitals – Outsourcing of Technical Co-ordinator(IT)).*

9. **G.O.(Ms) No.63 Health and Family Welfare (F1) Department Dated: 2.03.2010** *(Introduction of HMIS in all secondary care hospitals under the control of the Director of Medical and Rural Health Services in two phases – Implementation of changes in the hospitals systems – Formation of team at the Directorate level and nomination of contact persons at the district level).*

10. **G.O.(Ms) No.121 Health and Family Welfare (F1) Department Dated: 03.05.2010**

(Planning and Development – Introduction of Hospital Management System and Hospital Management Information System in all the Secondary care hospitals under the control of the director of Medical and Rural Health Services in two phases – Implementation of changes in the hospital systems-formation of the team at the Directorate level and nomination of contact persons at the district level – Orders issued – amendment to orders – Issued).

11. **G.O. (Ms) No.9 Health and Family Welfare (F1) Department Dated: 14.01.2011** *(Department of Medical and Rural Health Services - Implementation of a comprehensive HMS in all secondary care hospitals under the control of Director of Medical and Rural Health Services in all remaining districts).*

12. **G.O. (Ms) No.10 Health and Family Welfare (F1) Department Dated: 14.01.2011** *(Department of Medical and Rural Health Services - Implementation of a comprehensive HMS in all secondary care hospitals under the control of Director of Medical and Rural Health Services in all remaining districts – Dispensing away with the manual reporting system – Fixing responsibility on hospitals staff for online reporting).*

13. **G.O. (Ms) No.72 Health and Family Welfare (EAP 1/1) Department Dated: 23.02.2011** *(TNHSP – Establishment of State Health Data Resource Center and implementation of Operational Guidelines - "in-principle" approval).*

14. **G.O. (Ms) No.73 Health and Family Welfare (E1) Department Dated: 23.02.2011** *(Department of Medical Education – Implementation of HMIS in all tertiary care hospitals and 20 Government Medical Colleges (Including Government Dental College) under the control of Directorate of Medical Education*

and Pilot Implementation of HMIS in Government General Hospital, Chennai and Government Thanjavur Medical College Hospital and Implementation of University Automation System and College Management System (CMS) in Dr. MGR Medical University).

15. **G.O. (Ms) No.102 Health and Family Welfare (EAP 1-1) Department Dated : 01.03.2011**

(*TNHSP – Department of Medical Education – Implementation of HMIS in all tertiary care hospitals and 19 Government Medical Colleges (including Government Dental College) – Pilot implementation of HMIS in Government General Hospital, Chennai and Government Thanjavur Medical College Hospital – Implementation of University Automation System and College Management System in Tamil Nadu Dr. MGR Medical University – contracting of a consultant for a software development).*

2. Cost Effectiveness

HMIS is a solution that encompasses technology, procedures and people with a focus on providing timely and accurate information to micro manage at operational level and aid decision making at policy level. This solution aims to increase process and quality outcomes and decrease inefficiencies and costs. This would help control administration costs and maximize efficiencies of available resources. The huge cost involved in the procurement of records and registers are now being curtailed and a more cost effective system put in place.

3. Support Infrastructure

a. Sustainability

IT challenges faced by all deployments is, trying to accommodate increasing demand for new IT capabilities and services. The scenario in this case includes maintaining a fine balance between growths, cost savings, handling day-to-day operations and providing improved and extended services.

The mantra for success for this application includes :

1. Enablement of real-time, online data capture and updation
2. High availability
3. Reliability

After the project period the respective Directorate will maintain the HMIS

implementation and will be promptly supported by the **Department of IT**. The budget (recurring expenditure) needed to run this project will be factored in during the annual budgeting of the Directorate. The Department of IT will maintain the hardware/ software by means of Annual Technical Support every year.

One of the important *measurable outcomes of the HMIS implementation is* that approx. 60% of the registered patients bring back the PIN (Patient Identification Number) during their subsequent visits, which shows high patient compliance to this system. Even registered patients who fail to bring the PIN, their data can be retrieved by way of searching the name, address or the date of previous visit.

Creative use of resources has been instrumental in tiding over all these challenges. The project has been conceptualized as a centralized web based software solution with minimal technology support and maintenance dependencies. Notwithstanding this demand, the solution is customized to suit the needs of all departments and has been designed using the inputs from the end users across various Institutions and Offices.

Reliability and availability has been the key area of focus while drawing up the blueprint of infrastructural support for HMIS. Dynamic changes in technology and rapid growth of user needs are some universal changes. To counter the changing software scenario, TNHSP wisely chose an Open Source software stack to eliminate vendor lock-in, to create efficiencies, improve service delivery and maintain scalability. On the hardware front, uninterrupted connectivity is assured using **Tamil Nadu State Wide Area Network** (**TNSWAN**)—a 2 Mbps dedicated leased line terminating at each hospital level. As an automatic failover solution, this system includes a fallback mechanism—a redundant, 2 Mbps broadband connectivity has been setup at all hospitals such that an **automatic switch over** takes place from TNSWAN to VPNoBB and vice-versa in the event of failure of one of the connectivity mechanisms. A centralized web server which hosts the database is securely placed in a fully equipped Data center.

The **server Architecture** has been designed in such a way so as to enable redundancy at every level, so that there is never a server downtime. Every end user machine IP address is configured and locked by the IT technical Co ordintaor, so that the end users do not alter the same and also it has prevented IP conflicts

occurring within the Institution. The **IP schema** of the hospital is maintained by IT technical coordinator and also shared with the concerned Chief Medical Officer and the respective Directorate.

b. Application Solution Architecture

1. Centralized web based solution
2. On open source platform
   - J2EE
   - Postgre SQL Database
   - Glassfish Application server
   - Solaris OS

The Solution is a centrally hosted web based application. It follows industry standard three tier architecture via Presentation, Business Logic and Data Layer. The application is built on J2EE platform, the components used follow J2EE specifications.

The access to the applications are user role based and privileges assigned as per the designated roles and requirements defined by the respective directorates. The applications also audited and certified as fully compliant with the Open Web Application Security Project (OWASP) requirements.

The hardware requirement for the hospitals including the UPS and electrical cabling, Local Area Network - number of nodes and positioning of switches, was carried out by a technically competent agency. The agency after a thorough field inspection, prepared a scientific document detailing the exact requirements for each and every hospital including department wise breakup and cabling diagram for the hospital, based on which the procurement is being carried out.

TNHSP in coordination with Tamil Nadu Electricity Board has ensured that there are no power cuts during the outpatient hours of the hospitals. The hospitals are equipped with **UPS** with 2 hours back up to all to manage the situation in case of a power failure. The simplicity of the interface enables the use of the application directly by the end-users namely Doctors, Staff Nurses, Pharmacists, Lab Technicians, ANM's and Hospital workers. The centralized web-based solution

developed using open source technologies overcomes the blockades arising from vendor lock-in. The advantages of open-source technologies also supports customization required to handle situations unique to hospital management across all terrains in the country. The end user machines are loaded with Linux Operating system which has also proved to be cost effective till date.

The design caters for possible pain-points that could arise at operational level due to factors like remote location of the hospital, lack of trained manpower at hospital, operational exigencies etc. The solution is driven by low cost of support, ease of deployment, training, etc. HMIS data entry formats are fully standardized and provide for uniformity in reporting and data consolidation. Data input and collection in forms includes the data requirements for National Rural Health Mission (NRHM) and other reporting needs at State and Central level. Simple, yet comprehensive solution enables phased implementation such that the process enhances competency and the comfort-level of the end-users, taking it to a smooth roll-out.

The patients records being available online provides for ease of referral across the chain of hospitals from primary health care centers to secondary health care centers to tertiary health care centers as needed. This clearly demonstrates that the solution can easily adapt itself to different volumes and different levels of uses.

c. Capacity Building

The HMIS application is envisaged as a single State Health IT system. The government healthcare delivery covers a population of over 7.21 crores in the State of Tamil Nadu. The State Health Society also a major stakeholder also expects to extract/import most of the information needed for reporting and management from this application.

This centralized web based system on fully open source technologies was decided upon to optimize investments and more importantly, overcome the maintenance and skills availability at district/hospital level. The hospital records and processes were totally manual prior to implementation of the HMIS application.

Basic computer training followed by HMS training and HMIS training is imparted to all users with the help of TCS, TNeGA. at State head quarters and at District head quarters. Also training programs are conducted at individual hospitals for the doctors, pharmacists, Lab Technicians, Staff Nurses, IT co-

ordinators posted in all 32 districts of Tamilnadu train and support the users during their hospital visits.

Project management & Monitoring adopted;The project is being monitored by full time State HMIS coordinator along with a team from the respective directorates. The online reporting provides for status updates and helpdesk support. There are periodic reviews by the Project Director and respective Directorates on the online entry and usage status.

Training of end users are handled through both classroom and hands on training sessions. All training sessions for 5 districts as part of Phase I of the project fully completed. Refresher training also planned and implemented to target user groups to improve online usage.

Change management strategy defined and implemented as follows :- As computerization was introduced for the first time, the users had to be initially exposed to basic computer training and orientation. The e–Governance agency of the State also provided the basic computer training. Apart from the Application training, the champion/nodal teams at each hospital also trained to handle basic troubleshooting of IT infrastructure. Various government orders mandating the usage of online system also issued as needed.

Leadership support :

The Project Director & Special Secretary to Health Department, Secretary IT Department, NRHM Mission director along with the Directors of Medical services, Public Health and Medical Education have addressed the end users during training and other review sessions to reiterate the need and importance of ICT interventions for better patient care.

Interpretation and Action taken

1. Respiratory tract infection and Asthmatic Bronchitis indicates the high prevalence rate in tropical climates - ensured availability of appropriate drugs.
2. Degenerative arthritis and Fibromyalgia are next common in elderly – ensured rehabilitation activities.
3. Habits - Food and exercise – imply that Acid Peptic Disease and NIDDM are seen among the people - Counseling plays vital role.

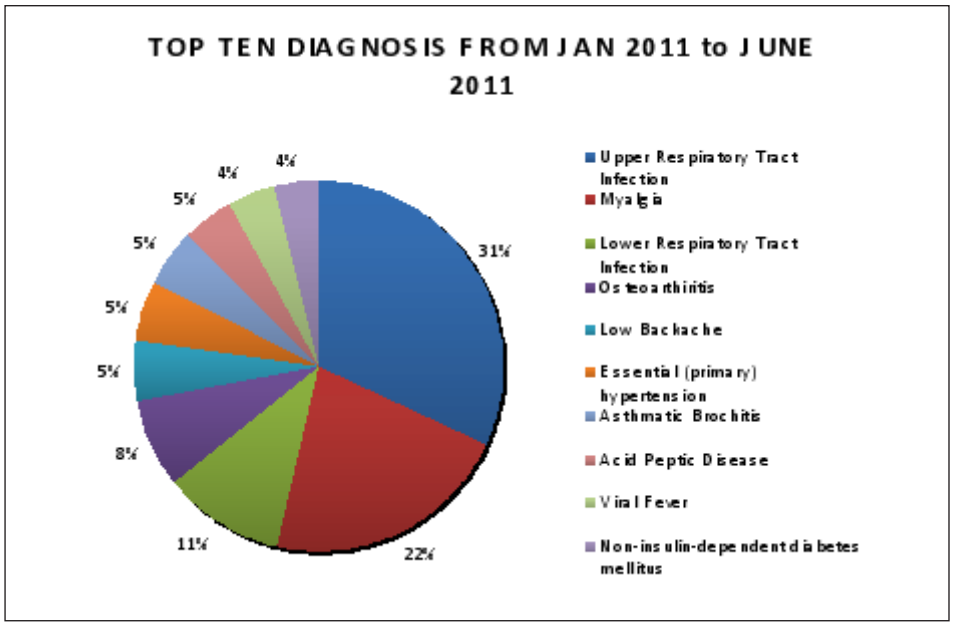
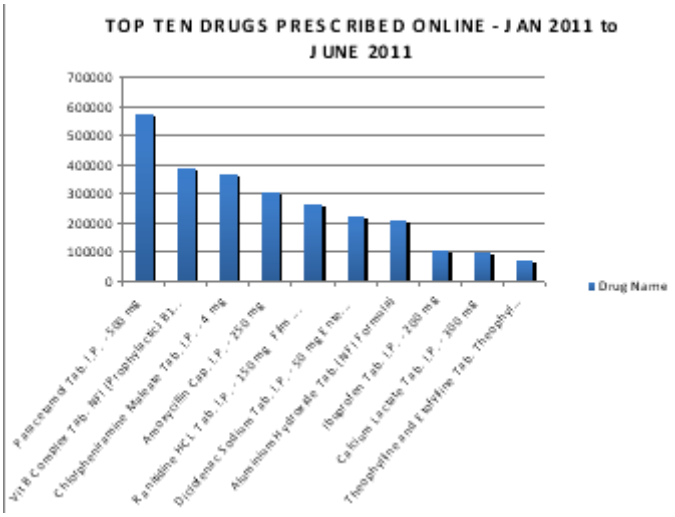


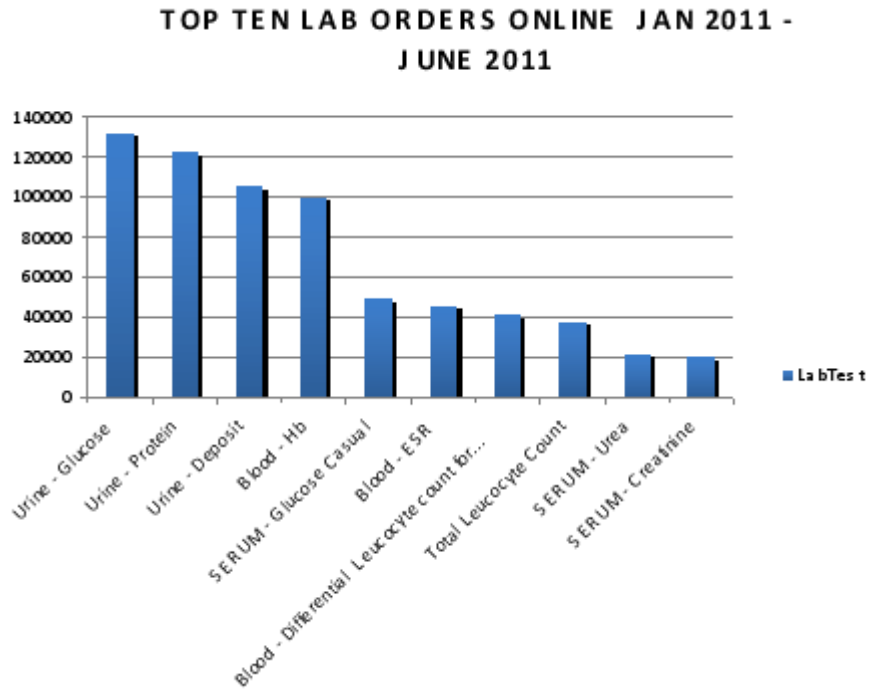
Figure 1: Drugs Prescribed Online



Action Taken

- Ensured the availability of drugs
- Procurement based on utilization
- Change in prescription pattern

Figure 2: Lab Orders Online



Interpretation of Action Taken

1. Majority suffer from Upper Respiratory Tract Infections / Lower Respiratory Tract Infections – Blood HE/ESR/DC/TC are done to evaluate.
2. Next commonly affected individually are elderly with osteoarthritis and Hypertension - Serum glucose/urea/creatine and urine glucose/protein/ deposits are done.
3. Based on instant results they are assured of speedy management and recovery.

Awards & Honours for HMIS

1. This Project was the winner of the e-India 2009 Jury award under e-Health category for "Best Government Policy / Initiative of the year 2009" which was awarded during the e-Asia Conference 2009 event held at Hyderabad August 25-27, 2009.
2. The Project Paper was selected for oral presentation at e-Asia Conference 2009 held at Colombo, Sri Lanka, during December 2-4, 2009.
3. The Project Paper was selected for an oral presentation at the Med-e-Tel 2010 conference at Luxembourg during April 14-16, 2010.
4. Based on the cost effective approach, this project has caught the attention of the following International Publishers, who have offered to publish this project as a book.
   1. The Lambert Academic Publishing AG & Co.KG, Germany.
   2. VDM publishing house Ltd., Mauritius.
5. Shortlisted for the final round of e-governance National Award for the year 2010-11.

IV) Value Indicators

1. Digital Inclusion

e-Inclusion under HMIS project includes the staff and users at hospitals who now benefit with ICT initiative in terms of time saving, record keeping and use to technology for quick and real time availability of health data. The staff hitherto carrying out manual maintenance of records can fully utilize the benefits of online system for data capture and reporting as needed.

The patient also is benefitted with the online availability of medical record across the government health chain for doctors to view and retrieve full patient history as captured.

Steps taken to address this factor

In Phase III activities, when this system is extended to Tertiary Care Medical College Institutions integration to Digital X-ray transmission/PACS planned,

interfacing with Tamilnadu Dr. MGR Medical University will enable further e-inclusion on academic specific areas.

Three members from Tamil Nadu Health systems Project has attended an International Conference on Digital Libraries on 23.02.2010 to 26.02.2010 at TERI, New Delhi.

2. eParticipation

Steps taken to address this factor

All staff at hospitals are being trained on use of computers and application as needed.

e-Participation is the generally accepted term referring to "ICT-supported participation in processes involved in government and governance". Processes may concern administration, service delivery, decision making and policy making. E-participation is hence closely related to e-government and (e-)governance participation. TNHSP with the implementation of HMIS facilitate E-Governence activities of district collectorates by providing the Public Health Data and other National Health Programmes. This enables the policy makers to decide on health policies and it is reflected in the annual health budget performance. The staff with interest and aptitude for ICT have also been trained on hardware, LAN and other local troubleshooting to help create nodal teams at locations for quicker diagnosis and resolution of IT infrastructure related issues. The entire staff can participate in utilization of the online system based on their roles and also interact with the Central helpdesk for any ICT related issues.

IT Coordinators, 3 Server Administrators and all other program officers are involved in this e participation. 32 Technical Coordinators from all the districts are also involved in this e-participation.

3. eWaste

Steps taken to address this factor

E-waste Management policy is adopted by TNHSP head quarters. Awareness among individual users is propagated by IT coordinators in various districts.

Action plan has been devised to keep the environment green. Tamil Nadu Health Systems Project is disposing its e-waste through a vendor adopting auction process imposing stringent rules for the clearance of e-waste.

As per the State e-Waste policy, the buy back and disposal of all IT hardware components are being followed. The ELCOT is the coordinating agency for implementation of this policy on behalf of the Health Department.

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