E-government Implementation: A Case Study of Dubai e-Government

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ABSTRACT

E-government is a new approach followed by nations in providing better services to people and businesses. It increases the efficiency of departments, reduces the cost, streamlines the processes and thus provides several benefits to all stakeholders involved. In this paper, we describe a case study on the successful implementation of e-government in Dubai using Chan, Lau, & Pan's (2008) e-government Implementation Framework. The various e-government initiatives undertaken by Dubai government have been described using the four components, namely information content, ICT infrastructure, e-government infostructure, and e-government promotion.

***Keywords*:** e-government strategies, e-government promotion, e-government implementation, ICT infrastructure

1. Introduction: Dubai's E-government Vision

Dubai's e-government journey started in the year 2000 with the official announcement of e-government initiative by Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President, Prime Minister and Ruler of Dubai. Prior to Dubai e-government initiative, Dubai Government provided its services through traditional means. Businesses and individuals had to apply for government services by compiling and submitting a set of documents to one or multiple government departments which often resulted in delays and frustrations for the users. In order to achieve its vision of becoming a leading business hub, Dubai Government decided to leverage on ICT infrastructure to simplify its regulations and services. Consequently, Dubai Government announced a major strategic initiative called "Dubai e-Government" in year 2000 with the mission of "achieving a virtual government through provisioning of high-quality customer focused eServices for individuals, businesses, and government departments". The initial target to conduct efficiently and effectively 70% of all government services through innovative channels by 2005 was also set in April 2000.

To make the initiative a reality, a high level Executive Committee comprising of experts and specialists was formed which was tasked to conduct a strategic audit and a strategic benchmarking activity. While the purpose of the strategic audit was to define the gap between the status of Dubai Government in year 2000 and the main goals of Dubai e-government initiative, the aim of the strategic benchmarking was to identify and analyze other successful e-Government initiatives around the world. After making many visits to USA, Britain, Singapore, and Malaysia, the Executive Committee concluded that there was no single 'one size fits all' e-Government approach for all the governments in the world and decided to create its own

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approach to e-Government. The team was then instructed to build an eStrategy for the various government departments including eGovernment infrastructure and vital eServices to begin electronic transformation of various government services. The five strategies (see Figure 1) - operational, organizational, financial, information technology and legal – formed a coherent and holistic set for the entire initiative (Bastaki & Geray, 2005).

Figure 1: Dubai E-government Strategies

After studying the IT status in all government departments, the team found that many departments already had a robust IT infrastructure and significant presence on the Internet including Dubai Municipality, Dubai Police and Dubai Customs. For example, Dubai Police had already set up a website and was offering e-services even before the launch of the Dubai e-government portal. On the other hand, some departments lacked the basic technical infrastructure and had no presence on the Internet at all. Thus, the first task of the team was to encourage all departments to procure technical infrastructure and launch their own websites. The e-government portal (www.dubai.ae) portal was finally launched in 2001 with 14 e-services and with each government department offering services online, the e-government was officially launched (Al-Shair, 2003). Between the date of the call in April 2000, and the launch of the portal in October 2001, the entire technical infrastructure was setup for government services to be provided electronically.

2. E-government Implementation in Dubai

This paper follows Chan, Lau, & Pan's (2008) e-government Implementation Framework to describe developments in Dubai's e-Government journey. The framework comprises four components: ICT infrastructure, information content, e-government infostructure, and e-government promotion. ach component and the major activities that were involved in it are outlined in detail below.

3. ICT Infrastructure

Creating a centralized Government Information Network (GIN) was one of the initial steps done by the IT strategic planning team of Dubai Government. GIN linked the government departments with each other and provided them with access to Internet. By end 2005, GIN included about thirty members comprising of government departments and other institutions participating in e-government initiative. GIN offered several advantages to the government departments such as offering highest level of security for government document exchange, standard Internet connection, unification of Internet connectivity standards, and removal of the network administration burden from the disparate government departments. Ruler's court, the central body that supervised all government departments in Dubai, was designated the sole responsibility for administering the network. The network offered the solid infrastructure for the portal's e-services (e4all, 2005).

4. Information Content

In developing the eServices that are being offered by the various government departments, the Dubai Government employed a "Five Stage e-government Model" (see Figure 2) as identified by the United Nations (2002).

The Stages of E-government

- Emerging: An official government online presence is established.
- Enhanced: Government sites increase; information becomes more dynamic.
- Interactive: Users can download forms, e-mail officials and interact through the web.
- Transactional: Users can actually pay for services and other transactions online.
- Seamless: Full integration of e-services across administrative boundaries.

Source: United Nations Report – Benchmarking E-Government: A Global Perspective

Figure 2: The Stages of E-government

At the time of the portal launch in 2001, the Dubai e-government was in "Emerging Stage" with an Internet presence through its official portal with 14 eServices. E-government efforts accelerated in Dubai since 2001, entering the "Transactional" stage two years later. By 2003, the number of e-services rose to more than 600, about 50 times more than the services in 2001. About 23 government departments were offering eServices to both citizens and businesses at that time. Out of 600+ services, 211 services were transactional and the remaining 406 services were informational in nature (e4all, 2003).

To better manage and monitor its e-Government initiative, Dubai Government chose a centralized approach whereby Dubai e-government team was split into two teams – eServices and Shared Services. eServices unit was designated with the responsibility to work with government departments to e-enable their services as well as manage the government portal (www.dubai.ae). It was made responsible for setting quality and security standards for offering services through the portal, and promoting these services through community outreach programs. On the other hand, Shared Services unit was made responsible for providing the infrastructure and applications necessary to integrate government departments through the GIN and providing government departments with technical expertise to publish content on Dubai e-government portal through the content management system hosted on the e-government server (e4all, 2003)

Due to a vast difference in the technical competence of various government departments and the departments not equipped with uniform applications, Dubai e-government team decided to adopt a hybrid strategy for e-services implementation: decentralization of the core services of every department and centralization of the common services (Al-Shair, 2005). The decentralization approach not only gave the government departments' autonomy and creativity; it also accelerated the enabling of services by various government departments. The common aspects of electronic services which were independent of government departments, e.g. authentication, authorization, payments, mobile services infrastructure, customer care services platform, was decided to be built by Dubai e-government. hese centralized common aspects were provided to the government departments through a single centralized entity with well defined common tools known as synergistic tools. These synergistic tools (Table 1) expedited service delivery by other government departments and helped to achieve cost savings by providing commonly utilized eServices to other departments.

During this period, the focus was on increasing transactional services to meet the 2005 deadline. By late 2004, there were over 1900 services provided by more than 20 government departments.

Approximately1300 of these 1900+services were transactional services while the rest were informational or interactive. While 56% of 1900+ services were G2C services (i.e. government services targeting individuals/citizens), 44% were G2B services (i.e. government services targeting businesses). The initial target of providing 70% of the government services online by 2005 was met when more than 1600 of the 1900+ services were migrated to online channels resulting in 81% e-enablement ratio (Bastaki & Geray, 2005). During these three years (2001-2004), while government departments focused on eServices enablement, Dubai e-government focused on synergistic eTools implementation and roll-out for all the government departments.

Table 1: Synergistic Tools in Dubai e-government

Synergistic Tool	Description
ePay	Centralized payment gateway to enable payments of government departments' services. It includes multiple payment types such as credit cards and eDirham.
eHost	Content Management System and hosting services provided to all the government departments to host and publish content for their portals in the shared infrastructure of Dubai e-government.
eLibrary	Centralized library database with a unified web portal. It enables users to share available books and other information material provided by all libraries connected to this service.
mDubai	An innovative channel for communication between customers and government departments via SMS. Includes push and pull messaging services provided over a single platform for all government entities.
askDubai	Unified contact center to all government departments in Dubai. It includes multiple channels for customer interaction such as call center, email. Fax, and online chat.
eJob	Unified recruitment service to all government departments in Dubai. It automates the process of recruiting national/non national job seekers in a centralized database.

Following the success of the first target, in mid 2004 a subsequent target of 90% e-enablement of all government services and 50% of all government transactions to be conducted through the various innovative channels by 2007 was announced by Sheikh Mohammed bin Rashid Al Maktoum. Five main strategic agenda items (see Figure 3) were formulated to achieve the vision. While the earlier phase (2001-2004) of Dubai e-government initiative focused on e-enablement of government departments' services; moving forward (2004-2007) the thrust was on quality improvement and customer adoption of e-services to achieve the e-government vision (Dubai e-government, 2004).

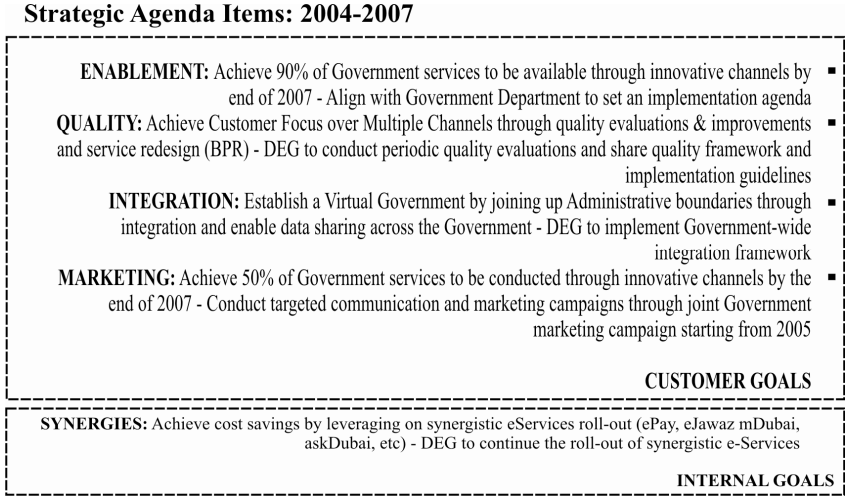

Figure 3: Strategic Agenda Items (2004-2007)

In order to meet the first strategic objective of 90% e-enablement of public services by government departments, Dubai e-government instructed all government departments to construct a Strategic Action Plan (SAP) indicating the services that will be e-enabled per quarter until 2007. To aid in preparation of SAP, e-government advised the government departments to identify all the public services (G2C and G2B) provided by each department and prioritize them for e-enablement using two main criteria namely ease of implementation, and service attractiveness.

To ensure success in achieving the second strategic objective of completing 50% of public services transactions through innovative channels, the Dubai e-government eServices division undertook a number of initiatives in 2005 such as providing eServices Quality Framework Definition and Implementation Guidelines to all departments; conducting periodic quality evaluation of eServices of government departments; building more synergestic tools; and conducting targeted marketing campaigns to increase awareness and usage of eServices by segmenting the customers and determining the right mix of eServices for each customer segment.

By mid 2006, 81% of government services were available online with a total of 1900 eServices (e4all, 2006). Although government departments were busy launching e-services with an e-service available every 10 days, Dubai e-government faced several challenges from government departments regarding the quality of eServices. For example, some departments made exaggerated claims about their eServices but their services were of little value to customers. Similarly, some departments focused on quantity and not quality of services. For example, the eComplaint Service used the same form that was used for another service, Suggestions. While the central infrastructure developed by Dubai e-government was offered for free to the government departments, the utilization of the infrastructure by the departments was very low as some departments were still building their own infrastructure such as web hosting, content management systems, and contact centers. Though the Dubai e-government eServices team had laid down several criteria for ensuring common standards of eServices, some departments did not enforce these criteria and as a result their applications were incompatible with some even charging an extra fee for electronic transactions.

Realizing that high quality customer-focused services were critical for eServices adoption and to meet the target of achieving 50% adoption of electronic services by 2007, Dubai e-government undertook two major initiatives in 2007 – the first one being full-scale evaluation of government websites with respect to more than 30 quality standards and the second initiative was checking the quality of eServices announced by different departments. The purpose of the eServices quality assessment was to measure the compliance of government departments' eServices with the eServices quality framework and guidelines given to all departments in 2005 and to identify areas of improvement for existing eServices (e4all, 2007).

Although there were areas of improvement in the eServices of some government departments, one department, Dubai Municipality, had achieved the milestone of migrating 90% of its services to electronic channels by late 2006, thus becoming the first department to meet the 2007 deadline. By mid 2007, another department, Dubai Electricity and Water Authority, accomplished nearly 90% eTransformation of its services, ahead of the deadline. With more than 2000 eServices launched in 2007, the target of providing 90% of government services through electronic channels was finally met and the Dubai e-government initiative entered the fifth and final stage of e-government.

With the vision of achieving virtual government by 2010, Dubai e-government started to focus on eIntegration as early as in 2005 when the eIntegration initiative was launched by Dubai e-government (e4all, 2005). As a first step to adopt world-class standards to regulate the eIntegration process, Dubai e-government joined the International Consortium for eIntegration, a non-profit industry body to establish universal seemless integration. At the same time, Dubai e-government finalized the Business Integration

Framework that specified three main items – integration standards, integration technologies and common integration backbone - and also started to conduct pilot integration projects. The aim of the Integration Framework was to specify a unified protocol that would connect all the government departments to a central server, sync.dubai.ae and coordinate data exchanges via this protocol. In order to better monitor the eIntegration among government departments, Dubai e-government launched the Dashboard project in mid 2006 with the objective of providing detailed analysis, alerting, and reporting for all the transactions executed by the eIntegration platform to decision makers involved in analyzing and planning government activities (e4all, 2006)

By early 2006, some government departments had started integrating with other departments. For example, Dubai Department of Health and Medical Services established network connectivity with Dubai Police and this integration offered benefits to both the departments in placing orders, purchasing and testing medications and medical supplies needed by Dubai Police. Though these integration projects didn't involve Dubai e-government, there were signs that some departments were interested in collaborating with each other and exchanging data electronically. By early 2008, more comprehensive eServices were being developed. For example, an integrated eService that enabled Dubai e-government a triumphant leap towards the final stage of e-government was ePermit launched by Dubai e-government in partnership with Dubai Customs, Dubai Municiaplity and Dubai Police in January 2008 (e4all, 2008). This service allows customers to submit their permit requests online and once the permits are issued by the relevant government entities, these are sent electronically to Dubai Customs.

5. E-government Infostructure

The e-government portal (www.dubai.ae), launched in 2001 was positioned as the e-government infostructure and considered as the gateway to all government departments and their services. It was designed according to the directives of the content consultant committee that included representatives from all government departments. The implementation of the website was carried out by a group of e-government specialists based on the standards laid by World Wide Consortium (W3C).

In late 2002, the portal was revamped with the addition of a content management system to categorize the integrated content on the portal more systematically. The decentralized content management system allowed each department the freedom to manage its own content, while remaining an integral part of the portal. The government departments could access the e-Government server through GIN and use the content management software to publish the content. At that time, the portal offered 110 eServices targeting various segments of the community including the individuals, business sector, and the private sector. In order to ensure easy access and retrieval, the services were categorised under various channels including business, education, employment, health, residents, legal, security, and tourism. In addition, the eServices were packaged into clusters for easy access to related services (AME Info, 2002).

Based on a survey conducted by Dubai e-government in 2005, the portal was again revamped with more user-friendly features. The bilingual portal was divided into six groups – citizens, residents, visitors, local businesses, foreign companies and investing in Dubai – and relevant eServices were listed under each group. Further, four contact channels – AskDubai, mobile channels, SMS, and GITEX 2005 – for public interaction with government departments were displayed on the portal homepage. An opinion poll section that tackled key questions about eServices offered on the portal was also added (e4all, 2005). The portal received record hits during 2005 with the user traffic increasing by 167%.

In all, more than 2,300 services are currently available through the e-government portal which are organised into four sections – citizens, residents, visitors, and businesses. Links to various government departments, latest happenings, how-to section, most used services, and general information services are

available on the home page. As a first step towards adoption of eServices, the "How-To" section offers a step-by-step guide for government procedures and transactions that are conducted manually or electronically. By February 2008, the adoption rate had reached 91% of the more than 2, 300 services available through the portal (Dubai e-government Website, 2008).

6. E-government Promotion

The e-government promotion involves a three prong approach of awareness, assistance and assurance (Chan et al., 2008). The first prong of awareness referred to the various publicity activities and strategies employed by the Dubai e-government to raise the public's awareness of eServices. Dubai e-government conducted several community outreach activities to raise the awareness and adoption of eServices such as road shows, competitions, promotions, online marketing, marketing with government departments, market awareness survey and rewarding the users of eServices. For example, Dubai Municipality rewarded the most frequent user of electronic transactions, the most frequent user of ePay service, as well as other groups of users from different fields. In addition, promotions of newly launched e-services were also done through the monthly publication of Dubai e-government, e4all magazine, which carried a series of informative articles on e-services in layman's terms. Covering various aspects of e-governance, it familiarized readers with the core concepts of eServices, hardware & software systems used, e-learning, and private sector's participation in e-services.

Creating awareness about government e-services was not enough; the next task was to improve the computer literacy rates. This was addressed by the second prong of assistance, where Dubai e-government provided assistance though the e4all initiative. Conceived as an integral part of the Dubai e-government's community outreach program, e4all initiative comprised of several awareness initiatives including eCitizen, eEmployee, eLearn, and eManager (Table 2). At the same time, Dubai e-government partnered with private sector to bring the digital products at a low price to the citizens. For example, partnership with PRO Technology provided members of eCitizen and eEmployee substantial discounts on products from Apple, HP, LaCie, and Dicota (e4all, 2005).

Table 2: Dubai e-government: e4all Initiative

e4all Initiative	Description
eCitizen	eCitizen was established by Dubai e-government in association with seven local training centers to provide 16 hours of classroom training to citizens and residents of Dubai. Consisting of 4 modules, citizens receive training on basic computer and Internet skills along with training on both individual and business oriented government services provided by various government departments. Upon successful completion of training, citizens receive and an eCitizen certificate from Dubai e-government.
eEmployee	eEmployee was launched specifically to raise the IT competency level of government employees and provided 40 hour training programme using both online and classroom training in collaboration with several training institutes. Consiting of 4 modules, employees received training on core computer skills in English and Arabic. Upon successful completion of training, employees receive an eEmploee certificate from the Dubai e-government and an ICDL START certification.
eLearn	To further boost the IT competency of individuals and government employees, Dubai e-government developed more than 3000 bilingual on-line courses for various disciplines including e-business, e-commerce, and Information Technology. Developed in a multimedia format, these courses can be taken at a customized pace depending on an individual needs.
eManager	Launched in 2007, this initiative aimed at managers and supervisors to enhance their project management and leadership skill through three online modules and certificate levels.
e4all Magazine	This monthly publication from Dubai e-government was designed to raise public awareness of the availability of e-services. Covering various aspects of e-governance, it familiarizes readers with the core concepts of eServices, private sector's participation in e-services, hardware & software systems, and e-learning.

The final prong of assurance in e-government promotion is very crucial as it provides assurance on privacy and security issues of e-services (Chan et al., 2008). The quality evaluation of government departments' services by Dubai e-government was based on a number of well defined criteria, one of which was security and privacy of e-services. It was extremely important to Dubai e-government that the security and privacy policy of eServices was created in both English and Arabic by the government departments and made known to the users. In order to increase users' confidence in the website, all government departments were advised to add a statement around security of the website and how information was shared with other government organizations. Furthermore, to enhance the reliability of the statement, government departments were instructed to add a link or reference to any kind of legislation in the security and privacy statement. At the same time, online payment security of centralized service, ePay was beefed up to match the world class security standard – 3 Domain Secure (3DS) ePay system. 3D secure was an advancement of Dubai e-government's older ePay system and offered higher levels of security for online payment of public utilities and fines, using either the eDirham card or through credit cards. Based on the three domain model, it ensured total protection of payment card information (e4all, 2005).

Other than the three prongs of e-government promotion, Dubai e-government also launched a 'Public Interaction Program' through e-surveys on the dubai.ae portal in 2005 to measure customer satisfaction level and enhance the quality of e-services. Posted in the form of a questionnaire, it invited the public to submit their evaluations, suggestions, and views on Dubai government's official portal, www.dubai.ae. In order to encourage greater interaction with public, Dubai e-government even awarded users with best suggestions. Based on user feedback, results of these ePolls were forwarded to the respective analysis team for service enhancement (e4all, 2005).

7. Lessons Learned

Dubai e-government provides a variety of online services to both individuals and businesses. Within a short span of six years, Dubai managed to get 90% of government services online. The ICT infrastructure coupled with a strong leadership enabled Dubai to move from the informational government websites to transactional websites and currently the aim is to integrate the functions across multiple government departments. The lessons learned from Dubai e-government implementation experience can serve as a guide in managing similar complex initiatives.

Strong Leadership, Commitment and Vision: E-government is a complex initiative involving multiple stakeholders and entities. The strong leadership with unified and coherent vision is extremely important for e-government success (Ke & Wei, 2004). The clearly articulated vision to "ease the lives of people and businesses interacting with the government and contribute in establishing Dubai as a leading economic hub" by Sheikh Mohammed Bin Rashid Al Maktoum ensured inspiration and commitment of all government departments. With a personal commitment from the leader who treated e-government as his personal project and had built its own website before the e-government official launch, it enabled the government departments to understand and appreciate the move towards e-government.

Flexible and Robust Infrastructure: The successful implementation of e-government initiative depends on the underlying ICT infrastructure comprising of secure servers, routers, firewalls, internet connectivity etc. In order to incorporate changes and additions in the technology infrastructure, Dubai e-government had formulated a technology master plan right from start for the required infrastructure and its related architecture (Bastaki & Geray, 2005). The creation of GIN that linked the various government departments was the first step towards building a robust and scalable infrastructure. Furthermore, the Dubai e-government's decision to build common e-services infrastructure for synergistic e-services enabled government departments to focus on their core services while incurring cost savings for Dubai Government.

Central Flexible Model: To better manage and monitor its e-government initiative, Dubai Government chose a unique centralized approach. While Dubai e-government centrally controlled and monitored the eServices development of various government departments, the government departments were given the freedom to creatively build their own eServices in the earlier phase of e-government initiative. This not only accelerated the eServices development, but it also helped the government departments in meeting the initial target of 70% of government services to be online by 2005. Similarly, Dubai e-government adopted a hybrid approach in implementing e-government initiative where government departments focused on eSevices enablement while Dubai e-government focused on building common parts (e.g. payment, customer support etc.) needed by all eServices. This balance between centralization of common aspects of eServices implementation and decentralization of eServices enablement was one of the key pillars of success in Dubai e-government initiative which resulted in standardization, best-practices sharing, cost savings, and reduced time to market (Bastaki & Geray, 2005).

Development Strategies: Although the overall vision of Dubai e-government remained the same, the development strategies kept changing to meet the vision. The biggest challenge faced by Dubai e-government in the initial phase of the e-government initiative was difference in the technical competence of various government departments. Some departments were technically qualified and demonstrated high competency, while others lacked even the minimum technological infrastructure. To bridge the digital divide among the government departments in the initial phase, Dubai e-government established a number of strategies such as providing support to government departments through two work teams – eServices and Shared Services, using centralized services methodology for synergistic eServices, and creating a set of policies for eServices implementation. When the initial target to conduct 70% of government services through innovative channels was met, the thrust shifted to service quality and customer adoption of e-services in the next phase of the initiative when 90% of services had to be available online by 2007. To accelerate the quality and customer aspect of e-services, Dubai e-government adopted a number of strategies such as provided eServices Quality Framework Definition and Implementation Guidelines to all departments; periodic quality evaluation of eServices of government departments; as well as conducted targeted marketing campaigns to increase awareness and usage of eServices.

Development of Human Resources: The e-government initiative can't be successful without the development of human resources. An individual (citizen or employee) is the basis of the success or failure of this initiative. Without citizens or employees able to accept electronic systems, the e-government model can collapse. Realizing the importance of raising the technical qualification of both citizens and employees, Dubai e-government launched several training programmes for citizens and government employees such as eCitizen, eEmployee, eLearn, and eManager. Furthermore, it enforced a policy of 'redeployment not replacement' by moving the employee to a new position rather than replacing the employee with a computer (e4all, 2005).

Public-Private Partnerships: e-government initiatives require a variety of business and IT skills such as business process reengineering, systems analysis and design, networks, software design and implementation etc. In order to address the IT skills shortage, Dubai e-government had formed strategic alliances with private sector to complement its competencies in various areas such as portal hosting and management, customer care, electronic payment, and mobile services among others. These strategic partnerships had been a critical step in achieving both short-term and long term strategic objectives of Dubai e-government (Bastaki & Geray, 2005).

The strategic outsourcing and alliance building had expedited Dubai e-government implementation and enabled it to focus on core issues.

8. Concluding Remarks

Dubai has been a showcase of success in the last decade both from a financial and economic perspective. Less, however, is known about the internal process transformations that have led to this success. This paper sheds more light on the changes in the way government services are delivered that have allowed for greater efficiency, visibility, and overall enhanced competitiveness of doing business in the country. The transformation has been accomplished by leveraging the Internet and to move towards an e-government framework. Vision and leadership, combined with meticulous planning, along with a cooperative mentality that was fostered, all contributed to the success of the initiative. For a country that has traditionally relied on its natural resources to move towards an information-intensive environment, and that too led by the government, which typically are never at the cutting-edge, is remarkable. And all this to happen in a Middle-East country, a region known for turmoil than development, makes it even more compelling. The powerful lessons that have emerged from the Dubai e-Government experience will serve as a robust guide to other nations. The success of e-Government in Dubai also demonstrates the power of Internet technology to transform government services even in countries that started late in the journey and where people's motivation and capacity to embrace change may not be high.

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