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E-GOVERNMENT IMPLEMENTATION: A COMPARATIVE EVALUATION OF WEBSITES MATURITY

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Abstract

E-government projects are getting a strong attention from the UAE government, keen on using this technology to facilitate its services to citizens and customers. In Dubai, e-Government's target is ambitious: it is required that over 90 per cent of the services on offer from the key government departments in Dubai are offered online by the end of 2007. E-government projects can easily be put at risk if projects lack government support, if a solid information infrastructure is not developed so that customers can use this technology, if the user involvement is not significant at the implementation stage AND if poor attention is given to business process integration. This paper discusses learnt experiences in current e-government websites implementation's experiences. It initiates a study of e-government in the U.A.E, based on the four stages European model. Finally, the paper addresses the importance of mapping the internal business processes with the new technology (i.e. e-government) in governments.

Keywords: e-government, lessons learnt, barriers, business process management.

1 INTRODUCTION

E-government is the use of technology by governments, particularly web-based Internet applications, to enhance citizens' access to government services and to enable citizens to make online transactions (Watson and Mundy, 2001). Rapid advances in technology and the advent of the Internet have redefined public expectations of the government and its services. Amongst the motivations of using e-governments are the provision of fast and convenient government services and the elimination of paper-based transactions (Weiling and Wei, 2004). Of course e-government usage and success depends on the assumption that the telecommunication infrastructure is sound. According to the World Public Sector Report by the UN (UN, 2004), the U.A.E ranked the highest amongst other countries in the region. Although slightly outdated, this shows that the decision to start to look into e-government at the time was sensible. However, regardless of other countries in the region, the telecommunication infrastructure index was still low at that time. Another factor that influences e-government success is citizens' perceptions of security and privacy issues while performing online transactions. And while the latter two factors might be a given in a number of developed countries, other countries still need to develop such infrastructure and trust before moving forward.

As reported, the U.A.E had the highest telecommunication infrastructure index in the region and thus seemed ready for launching e-government projects in the country. Indeed, acknowledging this necessity of utilizing the new electronics, information, and communication technologies, the movement toward implementation of e-government in the UAE has received in recent years the attention of the authorities and policy makers.

This research investigates successful and less successful e-government initiatives around the world. It also diagnoses the situation in the UAE (federal government), and in Dubai (as an example of local

government in the U.A.E). Finally it emphasises the importance of a suitable implementation strategy when it comes to advanced stages of e-government phases.

2 DISCUSSION OF E-GOVERNMENT INITIATIVES

In this section we discuss several e-government initiatives in the world and in the U.A.E.

2.1 E-government in the world

According to different sources cited by (Sang Lee et al., 2005), (Teicher and Dow, 2002) the leading countries in the implementation of e-government are the U.S, UK, Canada, Australia and the EU at large. Some Asian countries, such as Taiwan, Singapore and South Korea are also praised for good e-government best practices. E-government implementation efforts started in the mid-1990s in those countries with more or less similar objectives. In the USA, 'for instance, the main objective is to automate and integrate different islands of information to simplify and maximise the benefits of technology. In Europe the emphasis is to modernise public services and offer better services to citizens' (Navarra and Cornford, 2003)

There are also many studies in the literature that relate past experiences with e-government in several other countries (Melitski, 2005) with more or less success: Iran (Sharifi and Zarei, 2004), Singapore (Weiling and Wei, 2004), Norway (Folstad and Krogstie, 2004), Slovenia (Vintar et al., 2003), Australia (Teicher and Dow, 2002), China (Chao and Tong, 2005; Li, 2005; Zhou, 2004), Poland (Sikorski, 2004), The Netherlands (Janssen et al., 2005), UK (Choudrie el al., 2005; Irani et al., 2005) etc.

In the following table we discuss the different lessons learnt by a number of countries while implementing e-government.

Country	Lessons learnt	Remarks
Singapore (Weiling and Wei, 2004)	Successful implementation is related to: - Strong leadership with vision: - Motivating all stakeholders, - Promoting a shared understanding among agencies to appreciate the importance of e-government, - Formulating a strategic action plan for e-government implementation in the agencies, - Creating incentives for agencies to implement e-government - Creating a central funding scheme to prevent protectionism from agencies - Development of IT infrastructure and bridging the digital divide - Business process integration (avoid bureaucracy), by o Forming coordinating committees, organising policy forums, gatherings, o Using a common e-service infrastructure	Singapore is a small country with a one-level government. Singapore has a culture of collectivism that helps in enforcing policies. Uses CRM.
Slovenia (Vintar et al., 2003)	- In the early nineties: Creation of a centralised specialised government agency for informatics to develop a national IT infrastructure: served as a basis for the development of e-government. - Started by an ambitious plan for a three-years e-government implementation that proved unsuccessful: rapid e-government development holds traps. Lessons learnt are:	Slovenia has to remove legal and technical barriers to the implementation of e-services. Uses BPR.

	o One-time registration of changes o Mandatory acquisition and approvals by official bodies o Unified provision of services o Provision of e-services according to the principles of 'one-stop shops' o Strategies to overcome the digital divide o BPR (business process reengineering of administrative processes).	
UK (Choudrie el al., 2005; Irani et al., 2005)	- The government needs to overcome the digital divide. The digital divide is created by the inaccessibility of broadband in the rural areas. Also, only students and those in employment use e-services, whereas those in real need (unemployed, elderly) have no access. - To be successful, e-government needs to work further towards integration of systems, improving IT skills and security issues. Ineffective data protection laws, cyber crime and credit card fraud need to be dealt with to improve citizens' confidence in e-government. - In (Irani et al., 2005) nine lessons learnt are listed from studying two UK local authorities.	The related thoughts focus on local authorities.
Poland (Sikorski, 2004)	The success is mitigated. A better e-governance would be achieved by: - achieving consistency in regulations related to e-government to avoid operational problems and conflicts of competence. - achieving a competitive price for Internet access to access low income households. - lobbying for the usability of public web services from the side of consumers/users/citizens.	E-government initiatives were motivated by joining the EU.
China (Li, 2005; Chao and Tong, 2005)	The success is mitigated. A better e-governance would be achieved by: - Removing the resistance to the idea of e-government in officials' minds fearing for their roles and positions; reforming the government. - Dealing with the lack of transparency and complex administrative procedures. - E-government is left to the initiatives of the different cities and institutions. There is no uniform standard, understandable considering the size of the population and the country. - Improving the IT infrastructure and access to the Internet. - Adopting regulations and laws to promote the development of e-government, and protect web safety (such as enabling electronic signatures).	E-government implementation still lacks strong leadership commitment and support.
Iran (Sharifi and Zarei, 2004)	E-government initiatives are mainly oriented toward G2G. Despite a good start, Iran fell from the 44th position in 2001 to the 107th position in 2003 in the UN classification. Main reasons are: - A strong resistance from religious, ideological and political perspectives not so keen on spreading out information on the net. This needs to be overcome to achieve better results in e-government. Also, taking the step to first start with G2G will help overcome this fear as internal government procedures will be reengineered prior to get to G2B or G2C and would facilitate their implementation.	Ideologies and politics still have a paralysing effect on the development of e-government in Iran.
The Netherlands (Janssen et al., 2005)	The study surveyed municipalities in the Netherlands and the recommendations could serve as hints to others to: - Move from aiming at making existing information and services available to taking a customer-oriented approach by - for	The study examines municipalities only in the Netherlands.

	example - providing customization and subscription services. - Security issues must be addressed to provide a full service provider. - Public agencies have to cooperate to acquire the necessary expertise and resources, to offer and make use of collaboration tools. - Develop community-based, public-private business models.	
Australia (Teicher and Dow, 2002)	The main obstacles to e-government in Australia are : - The digital divide and achieving equity: large, sparsely populated land mass, rural and remote areas. - Fighting fraud, hackers and computer systems vulnerability.	Australia has federal, state and territory governments.

Table 1. Lessons learnt from several e-government initiatives.

2.2 E-government in the U.A.E

There are several methodologies to e-government evaluation detailed in (Sakowicz/UNPAN) and (Hu et al., 2005). Most methodologies are carried out by combination of several techniques including web surveys, questionnaires and face-to-face interviews. Several stage models are used by researchers to address the stages of Web site development. They are well discussed and referenced in (Peters, 2004). In this paper, the EU model indicator (refer to *Table*) is used to evaluate the stages achieved in e-government websites development (eEurope, 2002). According to this model, the simplest model is the so called information services (Stage 1) which means in practice that for this particular service, information only is available via the internet while the service itself is offered classically. On the other hand, Stage 4 means that for this particular service all activities are developed so far that everything can be processed and handled electronically (Vintar et al., 2003). The evaluation carried on in what follows is based on a careful assessment of e-government websites using the EU model indicator. The websites were analysed for the content and services available that *the average citizen* would most likely use. The usage of the stages in *Table 2* represents a straightforward benchmark which objectively assesses a country's online sophistication. Nonetheless, the author does acknowledge the limitations of such a study as it does not take into account the public sector professionals' insight, nor does it indicate the level of integration of such technology with the internal business processes. Also, it does not indicate users' perceptions of the web sites. It only consists of a first step towards a fully fledged evaluation.

EU model indicators
Stage 1: Information: Online information about public services
Stage 2: Interaction: downloading forms
Stage 3:Two-way interaction: processing of forms, including authentification
Stage 4: Transaction: full case handling (decision and delivery with payment)

Table 2. EU model indicators for e-government.

The implementation of e-government in the U.A.E is being deployed by three organisations: A federal e-government organisation which deals with the implementation and integration of e-government in the UAE federal departments. This entity is managed by the Ministry of Finance and Industry. The other two e-government's organisations are attached to the local government of Dubai (first e-government initiative in the country) and to the local government of Ras Al-Khaimah. All three companies' mission is to create a virtual government. The e-government implementation is thus a centralised effort in those organisations.

2.2.1 Federal e-government

As explained already the implementation of the federal e-government is taken care of by a centralised effort led by the ministry of Finance and Industry. The output so far is a single point of entry to the websites of the several federal institutions. At the time of this study[1] the federal government was claiming 29 federal organisations. 34% of these organisations did not have a presence on the web, i.e. stage 1 not achieved (refer to *Table 3*).

	Yes	No	Not applicable
Stage 1	66%	34%	0%

Table 3. Stage 1 achievements for the U.A.E federal government

Of the organisations that had a presence on the web, 32% reached stage 2 (Interaction, downloading files), 26% reached stage 3 and only 5% reached stage 4 (refer to *Table 4*). So although a recent report by the United nations praised the progress of the U.A.E in terms of its e-government readiness, emphasising the impressive gains acquired year-over-year among all the countries of the world in 2005 - advancing its ranking from 60 in 2004 to 42 in 2005 - (UNPAN, 2005), some progress still needs to be done when considering the websites solely. The UN index appraises the websites but also the infrastructure and the human resources. In this research we have focused solely on the websites.

	Yes	No	Not applicable
Stage 2	32%	63%	5%
Stage 3	26%	68%	5%
Stage 4	5%	89%	5%

Table 4. Situation of the e-government implementation of completed stage 1 websites.

A recent change in the government suggests a future boost to e-government. An example is the recent decision (February 2006) to extend the use of the e-gate system (a stage 4 application of e-government services) to all U.A.E airports (initially installed in Dubai airport this system allows U.A.E residents to simply swipe smart cards to speed up processing the passenger entry and exit through Passport Control & Immigration).

The federal government is also developing an e-form website through which citizens and residents can download administrative forms.

2.2.2 State Government: The state of Dubai

E-government projects in Dubai target three distinct clientele government-to-government, government-to-business, and government-to-consumer. Each category requires specialized attention. Indeed understanding customers and citizens' expectations is a key in the success of any e-government project. E-government in Dubai has adopted a different strategy as it is presented to citizens as a portal through which citizens, residents, visitors, local businesses, foreign companies, and investors may find a way through for - potentially- any of their requests to the local government. In other words, instead of having a single point of entry to the different local government *organisations* (a pointer to their own websites), the portal is a single point of entry to the local government's *services*. At first this strategy suggests a greater achievement in terms of e-government implementation, as it is harder to integrate

[1] January 2006

services (thus) processes across organisations than only within organisations. Our study of the e-services provided by the portal has led to the results of *Table 5*.

	Yes	No	Not applicable
Stage 1	100%		
Stage 2	70%	20%	10%
Stage 3	60%	30%	10%
Stage 4	40%	50%	10%

Table 5. Achieved Implementation stages in Dubai (January 2006)

An example of stage 4 achievements is the e-library system, police services such as traffic fines payments and licenses renewal, an online service for sponsorship applications.

To conclude this section it is important to note that the implementation of e-government in the U.A.E as well as in other parts of the world, involves heavy investments and risk to fall behind expectations. Many reasons could put such projects at risk. The experiences related in this section indicate that no matter how successful e-government is, no matter the size of the country, its population's characteristics, whether it is federal, state or local governments, the same pitfalls are consistently identified: the extent of user involvement, the commitment from the government authorities at top and at all levels, the maintenance of the websites, including information accuracy and update, the security and privacy issues as well as the adoption of supporting laws and regulations. Finally all studies emphasise the importance of mapping the back-office processes with the new technology (i.e. e-government) in order to achieve higher stages in e-government implementation. As this preliminary study shows it, e-government in the U.A.E is still far from stage 4 (as is the case of a majority of countries implementing e-government). To achieve it, reengineering effectively the business processes that support the technology is an unavoidable step.

3 IMPACT ON BUSINESS PROCESSES

All the studies related in the previous section emphasized the importance of government support, the development of a solid information infrastructure so that customers can use this technology, the user involvement at the implementation stage AND business process integration. (Bakry, 2004) discusses in his paper three development techniques that could be used for e-government systems' implementation: TQM (Total Quality Management), Six Sigma and BPR (Business Process Reengineering). We have already developed and studied best practices in BPR (Limam Mansar and Reijers, 2005; Limam Mansar and Reijers, 2007; Reijers and Limam Mansar, 2005). These best practices are general rules identified by practitioners to enhance existing business processes with the support of information technology. (Reijers and Jansen-Vullers, 2005) have examined the impact of some of these best practices on projects involving the development of online transactions (either e-commerce or e-government) and concluded to the importance of examining closely the business processes before, during and after the implementation of the online systems. It is reported that 85% to 95% of corporate e-commerce web sites are not linked up with their back-office processes (Krzywonos, 2000). Whether the figures are similar for e-government systems or not is still to be investigated.

Business Processes Reengineering challenges the difficulty of developing a new business process that is a radical improvement of the current design. BPR relies and acknowledges the important role of using the latest information technology tools to achieve that aim. It is proven that BPR is one of the most powerful ways to boost business performance and raise customer satisfaction. In the UAE and in the region, the role of this methodology will become even more relevant given the significant growth in IT needs and the economical and information development the country is undergoing.

4 CONCLUSION

In this paper we have reviewed the status of e-government implementation in a number of countries addressing the main lessons learnt in specific case studies. It suggests that no matter the size of the country, its population's characteristics, whether it is federal, state or local governments, the same pitfalls are consistently identified: the extent of user involvement, the commitment from the government authorities at top and at all levels, the maintenance of the websites, including information accuracy and update, the security and privacy issues as well as the adoption of supporting laws and regulations. Finally all studies emphasise the importance of mapping the back-office processes with the new technology (i.e. e-government) in order to achieve higher stages in e-government implementation. We have also initiated a study on the status of e-government in the U.A.E, using the four stage model of the EU. Let us remind that this study only examined the government related websites. It did not include aspects related to human resources, infrastructures or the implementation process. This study suggests that Dubai e-government is achieving significant advances in terms of websites maturity: all Dubai government institutions have a presence on the web (Stage 1) and 40% of them have even achieved stage 4 (i.e. full case delivery: handling decisions and payments online). The federal government is also progressing with 66% of the federal institutions having a presence on the web (Stage 1) of which 5% have achieved stage 4. In the case of federal government, the slower development pace can be explained by the need to federate all federal institutions in the different emirates. The different emirates are not equally equipped in terms of human resources and infrastructures. Motivation may also be a challenge at that level. Of course these are only hypothesis and will need to be investigated further. Generally, federal or state governments find it harder to achieve stage 4 in e-government implementation as this necessarily implies changes in the internal business processes. As much as for any redesign effort, the risk of failure is high if proper support from the users is not acquired or guaranteed. The next step of this work is to evaluate which best practices are most suitable for redesigning best practices in e-government implementation. Our BPR decision-making method (Limam Mansar and Reijers, 2006) will be used to conduct such an evaluation. It will imply addressing the risk generated from employees' resistance and the lack of managerial support.

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