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Using a Best Practice Case in evaluating e-Government potential in Iranian Cities

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Abstract: E-government implementation in developing countries has seen some very good examples in trying to modernize and digitize government but there is still a lot of work to be done. In the Middle-East region there have been a number of successful cases, but these still stand as isolated examples. Learning from experiences of developed countries is valuable and still applicable to developing countries. Identifying the exact extend of applicability of successful experiences of developed countries in this field can lead to identification of key success factors for implementation of electronic government in developing countries. Considering similar infrastructure and environmental factors, might contribute to successfully identify and adopt suitable experiences from other developing countries that have a proven track record in e-government.

The aim of this paper is to prove that the five stage process is applicable by analysing Dubai services and then applying the five stage model to the Iranian municipalities to demonstrate how far they are away from the Dubai model. The characteristics of three municipalities in Iran, namely Isfahan, Shiraz and Yazd have been studied and methodically recorded. These are used to establish the basis upon which common ground for requirements for developing electronic government can be identified. The authors of the paper attempt a two-stage approach: In the first stage a framework for developing electronic government have been introduced and evaluated against a best practice example in the Middle-East (Dubai municipality). This framework for implementation of e-government is based on the experiences recorded in developed countries. In the second stage, initiatives of the three municipalities towards implementing functional electronic government are compared with the validated framework presented in stage one. Five indicators have been used to evaluate and analyse the electronic service initiatives of the municipalities. These indicators have been extracted from comprehensive literature review in the field of electronic government.

1. Introduction

Electronic government as a theoretical construct is not properly defined. It can be considered as anything from the publication of government information online to any use of information and communication technology by the government. A number of approaches towards understanding electronic government has been presented (Layne2001, García 2005, Wimmer 2001, Zhou 2004 and Burno2002). Lanvin (2002) provides a visionary definition of the main characteristics and elements of e-government. According to this, e-government can be defined as the use of information and communication technology to transform government by making it more accessible, effective, efficient and accountable. E-government includes range of activities from providing greater access to government information and promoting civic engagement to providing development opportunities. Citizens, businesses and government agencies are benefiting from electronic government practice. **Whitson et al (2001)** have defined e-government as implementing cost-effective models for citizens, industry, federal employees, and other stakeholders to conduct business transactions online.

Wimmer (2001) explains different views on e-government in the progress of a public service development. 'Different Views' described as Cultural, societal and political view, Legal view, Process view, organizational view, user view knowledge view, security and privacy view and Technical view. This approach clarifies the concept of e-government by including progress of a publication service, abstraction layer and different views of stakeholders. A third approach is to identify the different applications of e-government as a way of explaining this concept (Garcia, 2005). These applications include facilitating e-knowledge, e-service and e-governance (Zhou, 2004). A further approach defines e-government by the help of different stages which appear in developing e-government, (Layne, 2001). These stages are cataloguing, transaction, vertical integration, and horizontal integration. This approach suggests that e-government is an evolutionary phenomenon and therefore e-government initiatives should be accordingly derived and implemented in each stage. In each stage some challenges come to surface. The main issue which has not been addressed by Layne is the digital divide. In other words in implementing electronic government according to Layne's model, there is no consideration of citizen participation. To address this weakness of Layne's model, the authors have extended his model in such a way that encouraging and empowering citizens for using electronic services would be considered during the development process of an electronic government project. This approach has been termed as "the five stage development model for deploying

electronic government in developing countries". In this paper, following the presentation of this model, the five stage model is compared with e-government developments in three major municipalities in Iran (Isfahan, Shiraz, Yazd). Subsequently the model is compared with a best practice approach in region. Based on the award wining record of the Dubai municipality in utilizing electronic services - Middle East ICT Excellence Award (Middleeastevents 2007) and other awards for their content , maintenance, etc (E-Government News 2007)- the authors considered this municipality as best practice approach in the region of the Middle East. Following these comparisons, this paper concludes with some of the limitation of the model and future development of this work.

2. A Five stage Model for developing E-government projects

Janssen (2006) considers creating an enterprise architecture which sets direction for future, ensures uptake of future initiatives and adapt and evolves when environment changes as key challenge for deployment of enterprise architecture in public sector. Developing countries are facing more challenges in developing electronic government (Heeks 2004). Proper telecommunications and legal infrastructures, supported by the political will for reform, are essential for the success of any e-government project. E-government strategies in developing countries should first target the improvement of their operations and processes and also the level of a government's ability to cooperate. After preparation of such a platform developing functional electronic government systems can begin. Layne (2001) has introduced his four stage model for electronic government which discusses functions and challenges of several stages of developing electronic government. The authors have chosen this model out of several other models of developing electronic government because of its adaptability and applicability to developing countries. Based on later studies (Reddick 2004, Sipior 2005, Blanger 2006), citizens participation has significant impact on success of electronic government. Blanger (2006) conducted empirical studies in rural areas and his finding shows significant impact of the digital divide on the use of electronic government services. Empirical studies by Reddic(2004) show that growth of electronic government is not linear as mentioned by Layne(2001) and it follows a S-shape theory which means that after a while the number of users of electronic services will not increase as it was increasing at the start of introducing electronic government services. Furthermore field studies by Sipior (2005) in United States shows that while a first time visitation of government websites was high among the users, there were no intention to continue this use. After revising these case studies, the authors have identified a set of initiatives to overcome problems associated with citizen's participation. These initiatives include bridging the digital divide (access divide and skill divide) in the process of electronic government development, encouraging citizen participation and empowering citizens to utilize electronic government services. These initiatives have been put together and a new stage (Interaction) to Layne's model has been introduced. Since these issues rise in the early stages of electronic government development the authors suggest starting this stage as early as possible and right after the cataloguing stage. Following is a brief description of the five-stage model for developing e-government projects.
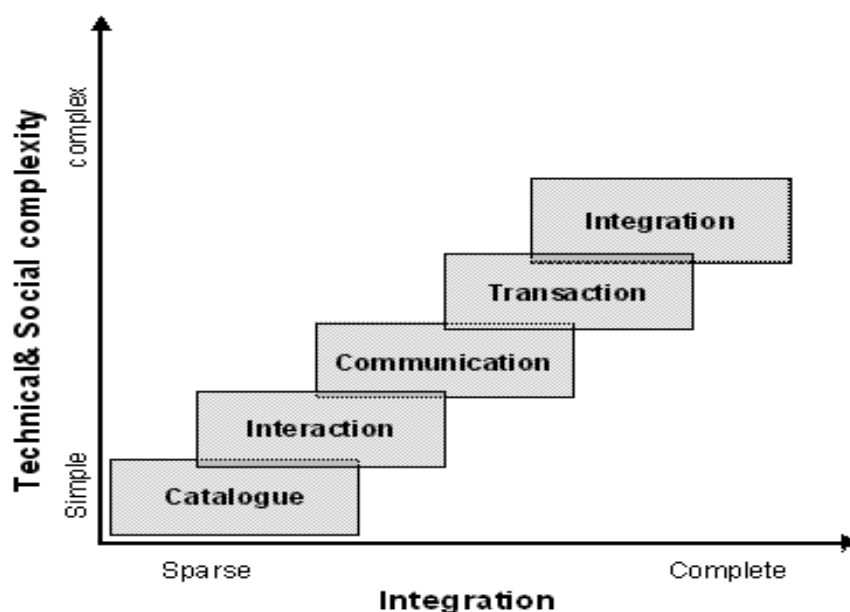

Figure1: E-government model for developing countries- adapted from Layne (2001)

2.1 Cataloguing stage:

In this stage government puts some of its information online and tries to create an informational web site which enables citizens to find government information online.
By doing so government starts to get familiar with online business and starts training its staff to become e-literate. This informational presence of government helps citizens to find out what to do to obtain specific government services. In this stage main technical challenge is management and designing information access for e-government. (Dawes 2004) presents array of consideration for designing information access. This array focused on the public policy goal of initiative, analyses problem and data management, organizational issues and users capabilities and requirements. Changes in citizen behaviour in future stages of developing electronic government can be recorded and analysed by this business model. Government agencies can use this information for improving their services to e-government stakeholders. In addition to online presence of government websites, information cataloguing, putting contact address of officials and specific information about available services and downloadable forms can be considered as examples for this stage.

2.2. Interaction stage:

Encouraging citizens to participate in electronic government development is vital factor in success of electronic government process. In the first stage, government information has been provided online in specific formats. If citizens do not participate in this process, the whole concept of electronic government will be meaningless. On the other hand involving citizens in the process of developing electronic government will contribute to build public trust in government. Corruption, lack of transparency in government procedures and high level of bureaucracy in developing countries makes it more difficult to move forward in this stage (Lanvin 2002) Reengineering of governance processes must be considered by developers in this stage. To encourage citizen's participation, government has to overcome social and technological barriers. Showing citizen that their contributions and comments are effective and transparency in government procedures which makes it easier for citizens to understand these procedures are motivating factors. The main obstacle to complete this stage is overcoming the digital divide. Some of the indicators and examples for this stage are evidence of encouraging and empowering citizens and businesses to participate in utilizing electronic services provided by government. For example citizens who seek services online will benefit from faster process of their inquiry, or some services can be provided with discounted charges to encourage citizens to try obtaining services online. Finally to enforce electronic interaction with government, some specific services can be provided electronically only.

2.3 Communication stage:

In this stage government initiates its communication with citizens (G2C), businesses (G2B) and itself (G2G). Adding more features to informational websites is the main technical challenge here. Communicating by electronic mail must be utilized in this stage. In this stage government puts downloadable forms online which can be filled by citizens before contacting government offices. These forms can be sent back to corresponding government offices by post or by person. In both cases it saves considerable amount of time and effort for citizens, businesses and government agencies. User feedback can improve the quality of services in this stage. Most visited web pages can be tracked so more effort will be putted in specific areas. It is possible for different government agencies to track user visit to each web page and the time that they spend on each particular subject. This information is useful for improving quality of rang of services which government offers but at the same time it can be used for commercial purposes (selling information to third parties). The main issue which arises here is that of privacy (Layne 2001). Reddick (2004) argues that this stage takes more time than it is planed. Explicit measures must be used to ensure privacy protection in this stage. In addition to electronic mail of officials, any other information which facilitated electronic communication between users and government can be considered as an indicator for this stage.

2.4 Transaction stage:

In this stage each government agency provides full service to citizens and businesses.
These services are limited to functionality of the specific government agency which has been contacted by citizens or businesses. For example, if citizens need to contact more than one agency to obtain a business license, they can't do it online. Renewing a driving license, filling a tax form online and paying tax online are examples of online transactions between government and other e-

government stakeholders. Providing database management system to support online transaction and Installation of proper security mechanism are main technical challenges. Authorization and authentication issues also must be addressed in this stage. There is additional challenge in developing countries for conducting online transaction and providing direct link to government services. Changing and improving legal framework to be compatible with online transaction is necessary for this stage. Users contact and transact directly by each agency directly and without any intermediation. Online transaction brings greater savings to users in terms of time and cost. Such examples are, facilitating financial transaction and sending official forms and documents electronically.

2.5 Integration stage:

In this stage all government agencies will be integrated together and one main electronic government portal will be accessible for users. Users can obtain all government services online and through this portal. Layne (2001) categorizes integration into two sub stages. First phase is vertical integration in which local systems will be connected to state government and federal government system in consequences and functionality of connected agencies are similar to each other. For example, the local judicial system could be connected to the state judicial system and the state judicial system could be connected to federal judicial system. In this way the record of any crime which has been committed in any state is accessible by other states' judicial systems. Another example is renewing a driving license in different state than the state which has issued the first license by connecting police systems all over the country. The second phase is connecting systems of different government agencies with different functionalities. Managing complex databases across different agencies and confidentiality of user information's are the main challenges in this stage. Another challenge is managing consistency in format and user-interface from one agency to the next. The function of this stage is quite similar to the Aggregator business model. As the aggregator provides one stop shopping, the main function of this stage is deploying one stop government. . By completing this stage the ultimate goal of electronic government in the country can be fulfilled and all the stakeholders of electronic government can benefit from one stop government services.

3. Dubai Municipality Services

The municipality of Dubai have been awarded as best electronic government project in the Middle East by several organisations. Service provision by this municipality can be use as a best practice example for the region. Furthermore, the five stage model can be evaluated against services which have been provided by Dubai municipality. One has to remember that the proposed model has been developed based on literature review of e-government exercises in developed countries with consideration of specific issues for developing countries. The municipality of Dubai provides different services for its citizens. These services are organised in nineteen categories. Each category has been presented in one form which allows different level of communication between citizens or businesses and municipality. These services have been described here and are also evaluated against the five stage model of developing electronic government. To clarify how each service is confirmed by appropriate ticks in tabular boxes below, a number of indicators and examples has been identified for each section and mentioned in section 2.1 to 2.5.Considering vast amount of services provided by Dubai municipality and the authors aim at comparing these services with Iranian municipalities that were selected for similarity of the types of services they offer. The following table shows the results of the analysis on a number of services provided by the municipality of Dubai.

Table1: Dubai municipality services

SERVICES	Stage						
CATEGORY	NAME	S1	S2	S3	S4	S5	Compatibility with 5 stage
Abattoir Services	Purchasing by products of slaughtered animals	✓	✗	✗	✗	✗	✓
	Refrigerator rental	✓	✗	✗	✗	✗	✓
	Slaughtering and cutting small animals	✓	✗	✗	✗	✗	✓
Admin Affairs Services(Administrative Services)	Register social clubs	✓	✓	✓	✗	✗	✓
	Request for permits for entertainment activities at social clubs	✓	✓	✓	✗	✗	✓
	renewing the social clubs license	✓	✓	✓	✗	✗	✓
	modifying the social clubs license	✗	✓	✗	✗	✗	✗
Admin Affairs Services (Public library service)	membership registration for general library and	✓	✓	✗	✗	✗	✓
	Request to Schedule school visit to library	✓	✓	✗	✗	✗	✓
Building and Housing (Building permits)	Final-Request for permit of New Building-Floor Area Ratio	✓	✓	✗	✗	✗	✓
	Request for Maintenance works permit	✓	✓	✗	✗	✗	✓
	Preliminary-Request for permit for New Building-Floor Area Ratio	✓	✓	✗	✗	✗	✓
Building and Housing(No objection certification)	No services found	✗	✗	✗	✗	✗	✗
Building and Housing(Demolition services)	No services found	✗	✗	✗	✗	✗	✗

SERVICES	Stage						
CATEGORY	NAME	S1	S2	S3	S4	S5	Compatibility with 5 stage
Contract and purchasing service (consultants & constructors services)	Delivering consultant's fees invoices	✓	✗	✗	✗	✗	✗
	Delivering supplier's payment vouchers	✓	✗	✓	✗	✗	✗
	Delivering documents on payment to contractors	✓	✗	✓	✗	✗	✗
	Procedures for signing contracts and rent documents	✓	✗	✗	✗	✗	✓
	Delivering documents on payments to the building demolition contractors	✓	✗	✓	✗	✗	✗
	Purchase tender and auction documents	✓	✓	✓	✓	✗	✓
	Delivering qualification documents of consulting offices and contracting companies	✓	✗	✓	✗	✗	✗
Contract and purchasing service (supplier services)	Delivering of materials	✓	✗	✗	✗	✗	✓
	Settlement of supplier's dues	✓	✗	✗	✗	✗	✓
	Local purchase orders	✓	✗	✗	✗	✗	✓
	Supplier's bids	✓	✗	✗	✗	✗	✓
	Number of account statements	✓	✗	✗	✗	✗	✓
	Suppliers` disputes	✓	✗	✗	✗	✗	✓
	Registration of companies in the suppliers` register	✓	✗	✗	✗	✗	✓
	The status of quotations	✓	✓	✓	✗	✗	✓

SERVICES	Stage						
CATEGORY	NAME	S1	S2	S3	S4	S5	Compatibility with 5 stage
Contractors and Consultants Qualification Services (Change Status and upgrade)	Application for change of project consultant after issuance of building permit	✓	✓	✓	✗	✗	✓
	Modifying contractor registration status - upgrading	✓	✓	✓	✗	✗	✓
	Modifying consultant registration status - upgrading	✓	✓	✓	✗	✗	✓
Contractors and Consultants Qualification Services(Licenses)	New Consultant registration with a temporary status	✓	✓	✓	✗	✗	✓
	Temporary license to contracting offices	✓	✓	✓	✗	✗	✓
Contractors and Consultants Qualification Services(Consultants Services)	No services found	✗	✗	✗	✗	✗	✗
Contractors and Consultants Qualification Services (Registration)	Request for registration in the engineering consultation practitioners register	✓	✓	✓	✗	✗	✓
Contractors and Consultants Qualification Services (Contractors Services)	No services found	✗	✗	✗	✗	✗	✗
Employment	Application for employment	✓	✓	✓	✗	✓	✗
Finance services (Car Parking Services)	No services found	✗	✗	✗	✗	✗	✗
Finance services (Others Services)	No services found	✗	✗	✗	✗	✗	✗
Finance services(Handing Cheques)	No services found	✗	✗	✗	✗	✗	✗

SERVICES	Stage						
CATEGORY	NAME	S1	S2	S3	S4	S5	Compatibility with 5 stage
Finance services (Settling Fees)	Get Payment Fees through DEWA	✓	✓	✗	✗	✗	✓
	Settlement of the charges 10% of the total sale volume of hotels according to the local order no. (7) for 1998.	✓	✓	✗	✗	✗	✓
	paying the damage to the municipality properties.	✓	✓	✓	✗	✗	✓
	Settlement of the charges 10% of the total sale volume of hotels according to the local order no. (7) for 1998.	✓	✓	✓	✗	✗	✓
	Settlement of cinema ticket sale charge	✓	✓	✓	✗	✗	✓
Planning and Survey	Request for name change in case of death	✗	✗	✗	✗	✗	✗
Public Transport Services	Transport of the dead body services outside Dubai emirate	✓	✗	✗	✗	✗	✓
	Weight set sale	✗	✗	✗	✗	✗	✗

S1: cataloguing; S2: Interaction; S3: communication; S4: transaction; S5: integration

3.1 Validity of the five stage model

By looking at table1 it is evident that the 5 stage model is not compatible with services when they are not available at all or not any relevant information is posted online. In one case (modifying the social clubs license), citizens have been provided with contact information without be informed about the basic required documents for receiving this service. In another case (application for employment service), the integration stage has been started before facilitating any transaction implementation. This is due to the nature of this service and indicates that for some particular services the integration stage could start before the start of transaction stage. Another considerable issue is that of a number of services for which there is no concern for encouraging and empowering citizens or businesses to participate in utilizing ITC facilities. Another fact is that some services like Abattoir services cannot be provided fully online.

However the municipality of Dubai has attempted to provide electronic services that can be used as a good example for other municipalities in the region and the model proposed here appears to be valid and compatible with provided services in the municipality of Dubai. Considering this model to be valid, can help in evaluating progress of electronic government implementation in less developed municipalities. In the next section, three Iranian municipalities have been selected and evaluated against the five stage model.

4. **Three Iranian Municipalities**

In this section the activities of three municipalities have been evaluated against the authors' own model and the results have been provided in the form of tables.

4.1 The Municipality of Isfahan

The Statistics and ICT organisation of the municipality of Isfahan was established in 1990. Main aims of this organisation are achieving electronic municipality, comprehensive development of advances in information and communication technology, proper managing and monitoring formation of suitable municipal infrastructures, organising municipality matters and providing suitable mechanism for service delivery to citizens. In 1998 the municipality of Isfahan started constructing a digital map as a part of their geographic information system. Currently, the Statistics and ICT organization of the municipality of Isfahan is finalising an ICT Master Plan for next five years. This master plan includes the following projects:

- Developing comprehensive and integrated systems for city and region planning, municipal services, traffic control, office automation, inspection, logistics, human resource, cultural [issues], incomes, financial, projects control and laws and legal issues which lead to achieving integrated management information system.
- Preparing technological infrastructure including design and implementation of specific fibre optic network for Isfahan municipality, design, development and implementation of local network, developing services and information security system and designing and implementing of data and communication centre.
- Editing GIS strategy and executing [relevant] projects
- Providing computer [IT] training for managers and officials of municipality

3.2 Shiraz Municipality

ICT master plan: Comprehensive plan for Shiraz electronic municipality contains four executive phase as follow:
- Phase zero: infrastructure development.
This phase includes organizing landed properties records, organizing current situation of landed properties, preparing digital maps for current situation of landed properties and providing relevant executive and detailed plans. Other aspects of this phase are gathering and reformatting] rules and conditions and identifying, reconsidering and improving business processes.
- Phase1: culture making
This phase includes general and professional trainings, reconsideration of organizational charts (changing municipality units to desktops), installation and implementation of electronic municipalities' subsystems and semi atomization of municipality business processes
- Phase 2: Automation
This phase includes constructing portals by automating municipality processes and exclusion of divisions from citizen's viewpoint.
- Phase 3: Compatibility with e-government and e-commerce
Delivering various municipality electronic services to citizens and government officials and delivering intra organizational services bare main tasks of this phase.

3.3 The Municipality of Yazd

- Yazd Municipality's Master plan includes integrated set of subsystems as follows
- City and region planning and restructure, businesses, incomes, properties.
- Building observation and control.
- Observing Engineers and Records
- Twelve subsystems for Automation of Municipalities.

The scope and complication of Yazd municipality and interference of other sections and units makes it rather difficult to implement this plan. In early stage, Training staff and rational step by step policies, building trust in new system are some of the initiatives which have been into account by management and implementation group (MIG) as responsible body for the project. Full support of higher management in municipality for MIG has been identified as lethal requirement in this stage. Another responsibility of higher managers in this step is identifying and addressing the challenges which occur due to radical changes in this stage.

Implementation of this plan is not installation of some programs or automation of some processes; it is based on preparing cultural infrastructure and training professionals to work with these systems. On the other hand it requires planning and milestones. The integrated nature of these systems made a phenomenon of everything or nothing from them. It is everything if it is gets popular and implemented successfully in municipality and it is nothing in the event of incomplete implementation and application.

FAVA (ICT organization of Yazd municipality) has aimed at developing electronic government and developing electronic cities. Defining and formatting and implementing organisational behaviour of municipalities in mechanized framework has been considered as a step towards achieving electronic government.

Current activities:

- Automation of official and financial procedures via implementing a financial and official inclusive system, which have been developed by this municipality and private companies,
- Developing informational portals for city council, municipality and its sub_ organisations for simplicity and acceleration of communication between municipality and citizens (e.g. electronic payment of taxes),
- Implementation and management of geographic information systems and database systems in municipality,
- Creating intranet for exchange of information writhen municipality,
- Running staff training programs for municipal official and sub-organization
- Organizing professional Seminars for cultural readiness and infrastructure preparation for electronic government.

Table 2: summary of activities and services of municipalities of Isfahan, Shiraz and Yazd

Stage	Cataloguing	Interaction	Communication	Transaction	Integration
Indicators	1.1 analyses problem and data management, 1.2 Organizational issues and users capabilities and requirements. 1.3 Online presence 1.4 Catalogue presentation	2.1 Reengineering of governance processes 2.2 overcome social and technological barriers	3.1 Downloadable forms 3.2 Communicating by e-mail(one way electronic communication and limited to one government agency) 3.2 Explicit measures must be used to insure privacy	4.1 Full electronic service (2ways but limited to one government agency) 4.2 Installation of proper security mechanism 4.3 Changing and improving legal framework	5.1 Vertical integration of government 5.2 Horizontal government agencies information systems
Isfahan	-Establishment of ICT master plan for Isfahan municipality -Designing and implementing data centre, communication centre - Producing record management system - Producing properties Database system - Producing information system	-computer [IT] training for managers and officials of municipality	-providing [building] electronic permission - Producing request system (requests for funds, cash and accounting)	-Pilot system for electronic payment system. -Producing taxing system for renewing and businesses - producing set of systems for rules and regulations of legal department	-Design of pilot network for wireless(wimax) data exchange of municipality

Stage	Cataloguing	Interaction	Communication	Transaction	Integration
Indicators	1.5 analyses problem and data management. 1.6 Organizational issues and users capabilities and requirements. 1.7 Online presence 1.8 Catalogue presentation	2.1 Reengineering of governance processes 2.2 overcome social and technological barriers	3.1 Downloadable forms 3.2 Communicating by e-mail(one way electronic communication and limited to one government agency)) 3.2 Explicit measures must be used to insure privacy	4.1 Full electronic service (2ways but limited to one government agency) 4.2 Installation of proper security mechanism 4.3 Changing and improving legal framework	5.1 Vertical integration of government 5.2 Horizontal government agencies information systems
Shiraz	-Installation and implementation of electronic municipalities subsystems	-Constructing portals by automating municipality processes -Reconsideration of organizational charts (changing municipality units to desktops) -General and professional trainings -Identifying, reconsidering and improving [business] processes. -Gathering and [reformatting] rules and conditions - Organizing landed properties records	-Semi atomization of processes	-Delivering various municipality electronic services to citizens and [government officials]	-Delivering [intra organizational] services
Yazd	-Implementation and management of geographic information systems and database systems in municipality - Automated telephone answering system	-Developing informational portals for city council, municipality and its sub_ organisations for simplicity and acceleration of communication between municipality and citizens (e.g. electronic payment of taxes). - Organizing professional Seminars for cultural readiness and infrastructure preparation for electronic government -Running staff training programs for municipal official and sub_oraganization		Portal for electronic payment of taxes),	

4. Discussion and conclusion

The municipality of Shiraz appears to have the best systematic approach when compared to the authors' model. Their ICT master plan starts with infrastructure development which is not included in the five-stage model. Considering the necessity of infrastructure availability and its importance according to Bayo-Morionesa(2007), and Lera-Lópezb(2007) and the critical role of infrastructure for success of any business strategy according to Rao(2007), adding this phase to the authors' model could be further explored. Looking at Shiraz municipality approach toward utilizing ICT facilities shows that they have good performance in cataloguing and interaction phases and they have started communication, transaction and integration phases in parallel. Interoperability among the different phases will be crucial, for success of the electronic government project (Lau 2007). In case of Shiraz and Yazd, The Transaction phase have been started before communication stage. Interoperability can't be achieved without having communication stage at its place. Furthermore investing on transaction and integration of services before completion of communication phase will lead this municipality to wasting its resource because they can't utilize transactional services before completing all previous phases. The last point to be brought into consideration is that there is no attempt to integrate services in Yazd municipality. Integrating electronic government services is an important promise of electronic government (Layne 2001) and it is crucial to the success and development of electronic government (World Bank, 2001).

In this paper the authors briefly presented their model for developing electronic government in developing countries. This model was originally based on literature review of electronic government development in developed countries with focus on specific issues relating to developing countries. The feasibility of this model has been checked versus a best practice case in developing an electronic municipality in the Middle East. After validation of the five-stage model for developing electronic government in developing countries the authors have compared three cases in Iran to this model and identified the extend of development and deployment of initiatives for each stage of developing e-government.

Further work in this research will be to compare the presented five-stage model of developing e-government with other successful experiences in this field aiming to refine and fine tune its applicability to initiatives for implementing e-government in developing countries.

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