

e-Government Services Maturity Models

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Abstract

This paper proposes parameters for developing a comprehensive globally accepted e-government maturity model. We investigate existing maturity models and their stages of growth, and identify various parameters based on the stages defined by Quirk's model, and additionally incorporating parameters such as secrecy, privacy & personalization. The proposed parameters for e-Government maturity models include: (i) Continent and sub-continent level, (ii) world e-readiness ranking level, and (iii) five stages incorporating infrastructure, offline services, web services, advanced e-services, and complete computerization.

Keywords: Digital Government, e-Decision Making, e-Democracy, one stop shop, New Public Management, e-Skills, e-Learning, e-govML, WebDG.

Introduction

The objective of e-government service is to improve efficiency by reducing effort for information collection, editing and quality in terms of accuracy, scope, personalization, interoperability. IT and Web-based public services can help governments to restore public trust by coping with corruption, inefficiency, ineffectiveness, and policy alienation (Parent, Vandebek, & Gemino, 2004).

In order to improve internal efficiency and delivery of public services, e-Government has been used by legislature, judiciary and administration.

E-government services are on the international agenda since many years, focus on it is increasing day by day. E-services are implemented and launched by the Federal & Provincial Governments.

The range of initiatives is continually developing. But there are still remarkably few statistics on the usage of the individual e-government services compared to services offered by other countries or inland off-line services. There is also very little information about the benefits of these services

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to the citizens and businesses using the services. As these services are still in their infancy, so this research considered lack of maturity of e-government, absence of e-government services maturity models, slow pace of government's progress.

Close and complex relationships between information technology (IT) and e-government are at their initial stages.

Old practices of bureaucratic micro-managed functioning of government stakeholders are being replaced with automated and widely accepted frameworks and models (Meneklis, Kaliontzoglou, Douligieris, & Polemi, 2005). Quick, efficient and reliable delivery of services is being initiated, which will develop trust in public sector. This automation will provide strategic data to the legislation to make fact based decision which will enable development and would help in achieving targeted goals.

To undertake this change, we require a model that has wide acceptance and which has customized parameters for each service. It should incorporate issues like personalization, periodic upgrades friendly user interfaces for leaders/ bureaucrats, reliable communication, and use of artificial intelligence.

Issues and Problems

Several issues and problems associated with e-Government services are investigated during the course of this research which are:

Secrecy, privacy, data protection and personalization. User wishes to utilize e-government services without providing personal data every time accessed (Jackson & Curthoys, 2001).

Proposed service options for e-security measures are not implementable. Only 4% users are using security services even despite the passage of digital signature acts (Parent et al., 2004).

Centralization & De-centralization Issue

UK government feels that a central provision of E-Government is worth pursuing whereas the US administration feels that this is not feasible given the federal system where states retain much autonomy.

Technological Issue

Technology is being developed daily, an expensive development become obsolete suddenly and frequently new upgrades are needed.

Awareness Issue

Decision makers often do not have awareness about e-government services.

Slow pace of Adaptation

Government has been slow to adopt new technology, e-government.

Legal issues arise during adoption of e-government. There is acute need for widely accepted legal model or other standardization for e-government (Parent et al., 2004).

Approaches and Methodologies

This research is based on the study of available e-government services maturity models. These maturity models are examined in the light of various services and their application in the concept of e-government with relation to digital divide, cultural and organizational differences. Thorough

study of existing maturity model enables us to determine the parameters on which a globally accepted e-government services maturity model may be developed.

E-government Services

There are many forms of e-government services (See Appendix-A), such as web site, web portal, online services, alerts, and mobility services. These services adopt customized approach as per their existing cultural heritage, requirements and legal position of the region. UK and USA public sector adopted the concept of e-government as digital government. They later on delivered e-government and web services. Many models have been used for implementing e-government services. Such models have been called maturity models and are known as staged models, linear models and theory models. While other researchers presented frameworks to out source e-government services. Widely used services include: e-Mayor, One-stop shops, intrainfo, and intradok (Dittrich, Ekelin, Elovaara, Eriksén, & Hansson, 2002).

Primary delivery models described in the research are Government-to-Citizen/Customer (G2C), Government-to-Business (G2B) and Government-to-Government (G2G).

Existing e-Government Services Maturity Models

Following existing e-government services maturity models observed New Public Management Model, e-Government Maturity Model, Model for Metropolitan reforms, e-government Model by Riley cover e-government, e-Governance, e-democracy, e-Local Government Model, e-Management, e-Service, e-Commerce, e-Decision Making/e-Democracy (Shackleton, Fisher, & Dawson, 2004).

Most e-Commerce or e-Business models outline three or four stages starting with net presence and moving through a stage incorporating element such as a rich array of information, provision for payment of service and interaction with customer. Government departments provide different type of services most of the time without payment. Therefore, application of e-Business models to the government sector may be inappropriate and not viable (Gisler & Spahni, 2000).

- a) Model for Metropolitan reforms: Musso, Weare et al's presented model of metropolitan reforms, which divides municipal government activities in the USA into two categories (Shackleton et al., 2004). Entrepreneurial measures emphasize the provision of services to residents and businesses to facilitate economic development. A more mature electronic presence, changes to municipal web sites advance activities of providing participatory or civic reforms such as facilitating the formation of interest groups and improving access to the decision making process.
- b) E-Government, e-Governance and e-Democracy: Riley outlines a model containing three progressive stages; e-Government, e-Governance and e-Democracy (Shackleton et al., 2004). In this model, governments move from net presence (e-Government), through to service provision and representative democracy (e-Governance), to a final stage of e-Democracy. This model suggests a linear progression to final maturity.
- c) Quirk's Four Staged Maturity Model: This model offers four stages with different spaces for e-government, which is widely accepted and used in the world. This model gives information at the lower end by Empowering Citizens at the final stage. It outlines different spaces of e-Government for local authorities. Quirk describes "e-Service: as Interface with customers, e-Commerce: as Cash transactions, e-Democracy: as Political dialogue between citizen and community, e-Decision-making: as Better informed public interest decisions, e-Management: as Improved management of people".

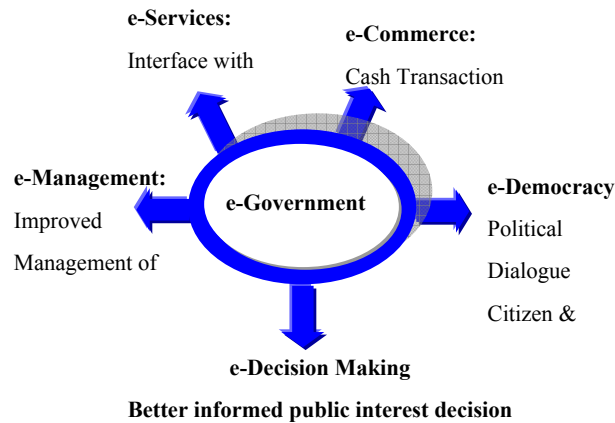


Figure-1. Fours Stages of Quirck Presented Model

Quirck’s presented four staged model (Figure 1) is based on quantitative study of the characteristics of 20 local government web sites. It identifies common features and provides some indication of the maturity levels of websites. To examine the content and level of maturity of different aspects of Victorian council web sites, a context matrix is developed and used to examine the presence of several features such as basic information, email facilities and the ability to make a payment. These features were grouped under eight areas, in the four categories as outlined in Table 1. (See Appendix B for more details.)

Table 1. Summary of Main Characteristics by category, earlier research, & research in Pakistan

Category & Feature	Score	Pakistan
e-management		
Basic Information	95%	100%
News and coming events	25%	85%
Email address	95%	80%
e-service		
Service details	90%	90%
Service tracking	05	20%
FAQs	25%	50%
Email support	0%	70%
e-commerce		
On-line payments	23%	0%
Ordering facility	5%	15%
Email payments/ordering	5%	15%
e-Decision Making/e-Democracy		
Community information	20%	45%
Links to other Organizations /business Bulletins boards	65%	65%
	0%	0%

Weightage of website's parameters is calculated in a way that a Web site feature is given a score of '1' if it is fully implemented, and a reduced score of ('0.5') if the feature is partly implemented. The score for each feature is totaled and then divided against the total number of Web sites. For example, if a parameter is implemented in 17 out of 20 web-sites, it would be given a content rating of 85% for that particular interest area.

The score highlighted in the table above is also compared with the current status of web-sites features of e-government in Pakistan by surveying 20 most popular and important governmental web portal/websites

In Pakistan G2G services are provided by one level of government to another level of government. Services are of different levels in government to government (G2G) Federal Government to Provincial Government. (FG2PG), Provincial Government to Local Government (PG2LG), Local Government to Local Governments (LG2LGs), For Government to Private Enterprises (G2B), and for Government to Citizens (G2Cs).

Evaluation of the Existing e-Government Services Maturity Models

Since the development of various e-government service maturity models, a number of factors have drastically changed and have therefore affected the performance and functionality of these services as well. E-government services maturity models developed in the last decade do not undertake the revolutionary change in I.T sector e.g. use of Teradata in search engines, organizing database dynamically, updating on real time. By using grid computing now we have computing power of a super computer in a workstation. Invention of compact technology is another revolutionary step towards performing heavy functions by small sized machines like blade servers. Usage of distributed database concept has changed the style of data organizing and back up.

With the development of these new technologies for data storage, auto capturing, such as cluster, grid, teradata and 64 bit computing the response time has been minimized. Therefore, there is need to evaluate existing maturity models at macro and micro levels. At macro level the emphasis is on reliability, security and quick delivery of service while at micro level, now the emphasis is on simplicity instead of animated & high resolution graphics website. Old styles are getting obsolete with newly used widgets. Parameters used for developing e-government maturity model by Quirck also need to be analyzed to accommodate this change in technology.

Future Work and Open Issues

Development of universally accepted e-government services maturity model will be the basis of standardization of e-government services. Achieving this task is still far from reality because this standardization needs basic data i.e. developed e-government services in various regions as per existing cultural heritage, requirements and legal position of the territory.

Table 2. World e-government status (UNPAN, 2005)

	2005	2004	2003
North America	0.8744	0.8751	0.8670
Europe	0.6012	0.5866	0.5580
South & Eastern Asia	0.4922	0.4603	0.4370
South & Central America	0.4643	0.4558	0.4420
Western America	0.4384	0.4093	0.4100
Caribbean	0.4282	0.4106	0.4010
South & Central Asia	0.3448	0.3213	0.2920
Oceania	0.2888	0.3006	0.3510
Africa	0.2642	0.2528	0.2460
World Average	0.4267	0.4130	0.4020

Table-2 shows world's e-government services ratio shows 0.01 percent increase during years 2003, 2004, and 2005 respectively, which is not a positive sign shows that increase in e-government services globally has been very slow.

Utilization of e-government services globally has been calculated @ 0.4267 during the year 2005, however e-government services in south and central Asian region slightly varies from global situation; as can be seen from Table-3.

Table 3. E-government status of South & Central Asia (UNPAN, 2005)

	Index	Rank in		
		2005	2005	2004
1	Kazakhstan	0.4813	65	69
2	Kyrgyzstan	0.4417	76	66
3	Maldives	0.4321	77	78
4	Uzbekistan	0.4114	79	81
5	India	0.4001	87	86
6	Sri Lanka	0.3950	94	96
7	Iran	0.3813	98	115
8	Tajikistan	0.3346	117	..
9	Nepal	0.3021	126	132
10	Bhutan	0.2941	130	165
11	Pakistan	0.2836	136	122
12	Bangladesh	0.1762	162	159
13	Afghanistan	0.1490	168	171
	Average	0.3448		

Pakistan, which is at No. 122 in world e-readiness ranking in the year 2004, is in declining position and at ranking No.136 in the world, during the year 2005. To address the situation e-government maturity model could be developed on different criteria: (1)Sub-continent level Ma-

turity Model (2) World Ranking level Maturity Models (3) Five staged (infrastructure, offline services, web services, Advanced e-services & Complete computerization) level maturity Models. An important point which can also be taken into account is that these Maturity levels always need updates, patches, revisions and versions to cater to the changes of this challenging world.

Each level has some pros & cons. For example, Sub Continent level Maturity Model will cater to the language, heritage, culture & legal issues, World Ranking levels Maturity Model will cater to the global uniformity/standardization, Five stages Maturity Model may cater to both issues but need a little customization as per regional requirements.

Conclusions

The objective of this paper is to provide the parameters for globally accepted e-government maturity models. On what parameters a comprehensive globally accepted e-government maturity model could be defined for e-government services. Average e-government status of the world is at 0.3448 which shows more than 65% work is to be done in the field of e-government services while maturity of these services is another issue. On the basis of 35% existing e-government services defining globally accepted maturity model or standard will be requiring much efforts and trouble. Our initial research focused on the already defined models and their stages of growth. We identified various parameters based on the stages defined by Quirk's staged model and additionally considering some current issues. E-government services maturity models, developed on parameters is suggested, sub-continent level, world ranking level & staged (infrastructure, offline services, web services, Advanced e-services and Complete computerization) level.

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Appendix A: Different Kinds of e-Services

■ Submission of Job Application.	■ Local government electronic service delivery
■ Submission of forms	■ News letters
■ Registering in a specific website for auto info about specific organization	■ Electronic messaging
■ Accessing a Digital library	■ Tax return
■ Booking in an airplane	■ One-stop government
■ Booking in Railway Train	■ Electronic Signature
■ Admission in a college/school	■ Reporting against theft
■ Viewing result	■ Voting
■ Viewing Draw, housing scheme etc.	■ Tourism & Culture info
■ E-mailing	■ Laws, Rules & Regulations
■ Obtaining information about specific thing/place/topic etc	■ Complain Cells
■ Depositing fee	■ Help (i.e Fire, Police, Judicial)
■ Information surfing	■ Media services
	■ Security

Appendix B: Survey of Pakistani Websites as per Criteria Developed by Mr. Quirk

Category & Feature	Pakistan.gov.pk	pak.gov.pk	presidentofpakistan.gov.pk	nrb.gov.pk	tourism.gov.pk	pakrail.com	pakpost.gov.pk	sindh.gov.pk	nwfp.gov.pk	punjab.gov.pk	blochistan.gov.pk	fdsindh.gov.pk	lgdsindh.gov.pk	foodsindh.gov.pk	excisesman.gov.pk	lahore.gov.pk	pap.gov.pk	sbp.org.pk	radio.gov.pk	hec.gov.pk	Score	Score (Shown in Quirk's Model)
e-management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100%	95%
Basic Information	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	85%	25%
News and coming events	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	80%	95%
Email address	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80%	95%
e-service	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	90%	90%
Service details	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20%	5
Service tracking	0	0	0	0	1	0	1	0	1	1	1	1	0	1	1	1	0	1	1	1	50%	25%
FAQs	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	70%	0%
Email support	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	70%	0%
e-commerce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	23%
On-line payments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15%	5%
Ordering facility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15%	5%
Email payments/ordering	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15%	5%
e-Decision Making/e-Democracy	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45%	20%
Community information	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65%	65%
Links to other Organizations/business	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%
Bulletins boards	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%