A Suggested Framework for Assessing Electronic Government Readiness in Egypt

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Abstract: Electronic Government (e-Government) is becoming a global phenomenon that is increasingly attracting the attention of community citizens including politicians, economists, decision and policy makers amongst others. Once only regarded as a means for modernizing the public sector and increasing government productivity and efficiency, e-Government is presently recognized as a driver and a key enabler of citizen-centric, cooperative, and seamless modern governance implying not only a profound transformation in the way government interacts with the governed but also the reinvention of its internal processes and how organizations carry their business both internally as well as externally while interacting with the other segments of the community. Based on the literature, it is frequently claimed that the availability of an effective e-Government assessment framework is a necessary condition for advancing e-Government proper implementation. The objective of this article is to develop an e-Government appraisal framework encompassing several components such as people, technology, processes, and strategic planning. The article examines the relations and interactions of these components in an emerging e-Government environment using a case study on an agency affiliated to the government of Egypt as a primary step in the process of testing the framework presented.

Keywords: government; e-Government; e-Government readiness; e-readiness; internet; strategic planning; information and communication technology; public sector; IT transfer; developing nations; Egypt

1. Introduction

e-Government is predicated on leveraging the power of information and communication technology (ICT) to deliver services provided by governments at local, municipal, state and national levels; however, how these benefits will be reached is still a matter of controversy (Krishnaswamy, 2005). The currently unacceptable return on investment from e-Government (Collinge, 2003) dictates the need for defining measures of success (Stowers, 2004) to raise awareness and to confirm the viability of application of e-Government approaches (UNDESA, 2003a).

Available benchmarking e-Government initiatives do not provide a comprehensive framework for assessing, classifying and comparing different e-Government programs (Hu et al., 2005; Grant and Chau, 2005). Most appraisal models are more suitable for the appraisal of the overall development of e-Government in each country; they are not directly focusing on the problems that exist in individual e-Government projects or on the internal factors affecting transformation of a government organization due to ICT adoption. Moreover, most of these approaches ignore the view of civil servants, even though they constitute the cornerstone in the success of any e-Government project as the direct users.

This article reviews recent frameworks to modeling and assessing eReadiness and electronic government readiness (EGR). The deficiencies of these frameworks are pointed out and by drawing on their merits, and on the literature addressing information systems (IS) and eCommerce success; the article suggests an EGR framework of e-Government project assessment focusing on electronic management, an aspect that should not be ignored by governments (Dawes, 2002).

The article recommends that in order to reach success in applying e-Government, public agencies should realize the importance of the integration and transformation between all e-Government building blocks: IT strategy, processes, technology, and people. The suggested EGR framework is evaluated against feedback from employees working in a one of the public sector organizations in Egypt. This constitutes a first step in the process of verifying the viability of the framework. Subsequent studies are taking place on other cases. Findings of all cases will be evaluated in the near future.

2. Theoretical background

This section highlights the main theoretical concepts in the literature related to EGR assessment. Emphasis is given on several eReadiness and EGR models highlighting their limitations.

2.1 eReadiness measurement tools

Assessing EGR leads to the investigation of a country's overall eReadiness (Kovacic, 2005), defined as "the degree in which a community is qualified to participate in the Networked World" (Budhiraja and Sachdeva, 2002). A thorough investigation of 18 eReadiness models identifies five key categories of assessment criteria: IT infrastructure, human resources, policies and regulations, environment (economical, political, cultural), and e-Government (addressing internal factors affecting it such as public websites and ICT usage by government).

Table 1 shows a comparative analysis between selected eReadiness assessment models. The table presents each model along with the entity that developed it, its focus, and the main components it measures based on the classification presented above.

Table 1: Comparative analysis between eReadiness tools

Tool	Focus	IT Infrastructure	HR	Policies and Regulations	Environment	e-Government Transformation
1- Center for International Development – Harvard University and IBM (CID)	e-society	√	√	√	√	Government effectiveness in promoting the use of ICT Availability of online government services Extent of government Websites Business Internet interactions with government
2- Center for International Development and Conflict Management (CIDCM)	e-society	√	√	√	√	
3- International Telecommunication Union (ITU)	e-society	√				
4- World Bank (Knowledge Assessment Methodology - KAM)	e-economy	√	√		√	Availability of e-Government services
5- World Economic Forum, Infodev & INSEAD (Network Readiness Index - NRI)	e-economy	√	√	√	√	Government use of ICT for its own services & processes Volume of transactions that businesses have with governments Presence of government services online
6- U.S. Agency for International Development (USAID)	e-society	√	√	√	√	ICT usage in government (hardware, software, and networks in each ministry)
7- The World Information Technology and Services Alliance (WITSA)	e-economy	√	√	√	√	

Reference table 1, the findings indicate that some eReadiness tools, such as CIDCM, ITU, and WITSA do not include e-Government in their assessments. The other tools (CID, KAM, NRI, and USAID) do not consider all internal factors affecting EGR; they only assess availability and number of eServices, and promotion and usage of ICT by the public sector. This can be applied on additional tools included in the eReadiness literature such as, Asian Pacific Economic Cooperation - APEC (Luyt, 2006; Budhiraja, 2002; Bui et al., 2003), The Computer System Policy Project – CSPP (Budhiraja, 2002; Bui et al., 2003), Computer

McConnell International-MI (Luyt, 2006; Bui et al., 2003), World Economic Forum-WEF (Budhiraja, 2002), Mosaic-MQ, Metric-Net-E-Economy Index-M-N, Information Society Index-IDC, The Economist Intelligence Unit-EIU, Crenshaw and Robinson-C&R, Center for International Development & Conflict Management-CIDCM, Country Development Gateway-CDG (Bridges.org, 2005).

eReadiness assessment tools do not undertake in-depth research concerning e-Government, ignoring vital elements, such as culture and technology acceptance of public officials (Dada, 2006), quality of ICT in government, strategic alignment, etc. In addition, eReadiness indicators are over-simplified measurements not reflecting a veritable e-Government status, omitting more relevant dimensions difficult to be measured (Bannister, 2004). Altman (2002) concludes that there is no direct relation between eReadiness and e-Government implementation in a country; this clarifies Jansen's (2005) recommendation to focus on the most particular factors to e-Government when attempting to measure it. Based on the analysis presented, the study confirms the inadequacy of eReadiness tools for assessing EGR.

2.2 EGR frameworks

All developed EGR frameworks have several shortcomings: (i) being result-oriented, focusing mainly on quantifiable factors of e-Government, (ii) emphasizing the promotion of eService quality through evaluating the services offered by governmental Websites; but measuring only the public websites limits the way e-Government should be perceived (Peters et al., 2004); it seems that there is less attention to the streamlining of back office operations (Homburg and Bekkers, 2002), (iii) failing to restrict their research boundaries to the internal factors directly related to e-Government; rather than investigating external factors such as IT infrastructure, and human capital. (iv) for those who approach the back office or eAdministration (Koh and Prybutok, 2003; Bertelsmann Foundation, 2002; WASEDA University, 2006); they limit their assessments on developed countries without verifying their applicability on developing countries, (v) approaching e-Government only at a nationwide level, rather than evaluating it at a micro level, i.e. over a public organization (Hu et al., 2005). Finally, these models are assessed relying on one or more of three methodologies: 1) secondary data; 2) citizens' feedback; or 3) policy makers of e-Government projects. Except for the model developed by Koh and Prybutok (2003), all other models do not evaluate EGR from the perspective of government employees; how they perceive e-Government, and their degree of awareness and belief in its viability. This group could be the best candidate to identify the most important factors affecting EGR since they are one of the major project's stakeholders. Additionally, it is very important to investigate the extent of communication between government employees and e-Government policy makers.

The use of different sets of indicators with different assigned weights in all eReadiness and EGR models lead to varying conclusions on the countries' performance. Limiting surveying and ranking different nations according to their scores on selected indexes removes the attention from more fundamental issues. As a result, developed eReadiness and EGR models can serve only as a foundation for constructing an EGR framework for a public organization.

3. A suggested framework for assessing EGR

The suggested framework derives its dimensions from previous research on IS and eCommerce success, eReadiness, and EGR. The following lines present an explanation of the different dimensions of the framework.

The proposed framework adopts the four-phase model of e-Government (Baum and Maio, 2000) that classifies e-Government into four dimensions: strategy, processes, technology, and people. In addition, the research suggests a number of constructs under each dimension in the framework. Aiming to overcome the several shortcomings that exist in previous EGR assessment models, the framework covers all internal factors that affect EGR (see figure 1). It acts as a prototype in the form of a checklist. A public organization can verify the presence or absence of each construct under each dimension.

Although external factors such as environment, IT infrastructure, regulations, etc. are proved to be important in assessing EGR, they are not investigated in this research. The emphasis is instead on the internal factors that exist within a public organization because previous studies in eReadiness and EGR had already addressed them. Also, it is preferable to develop an in-depth analysis of all internal factors, which contains a rather large number of measures. Adding external factors leads to a cumbersome and complicated framework shifting the attention from the internal factors that are the main concern of the study.

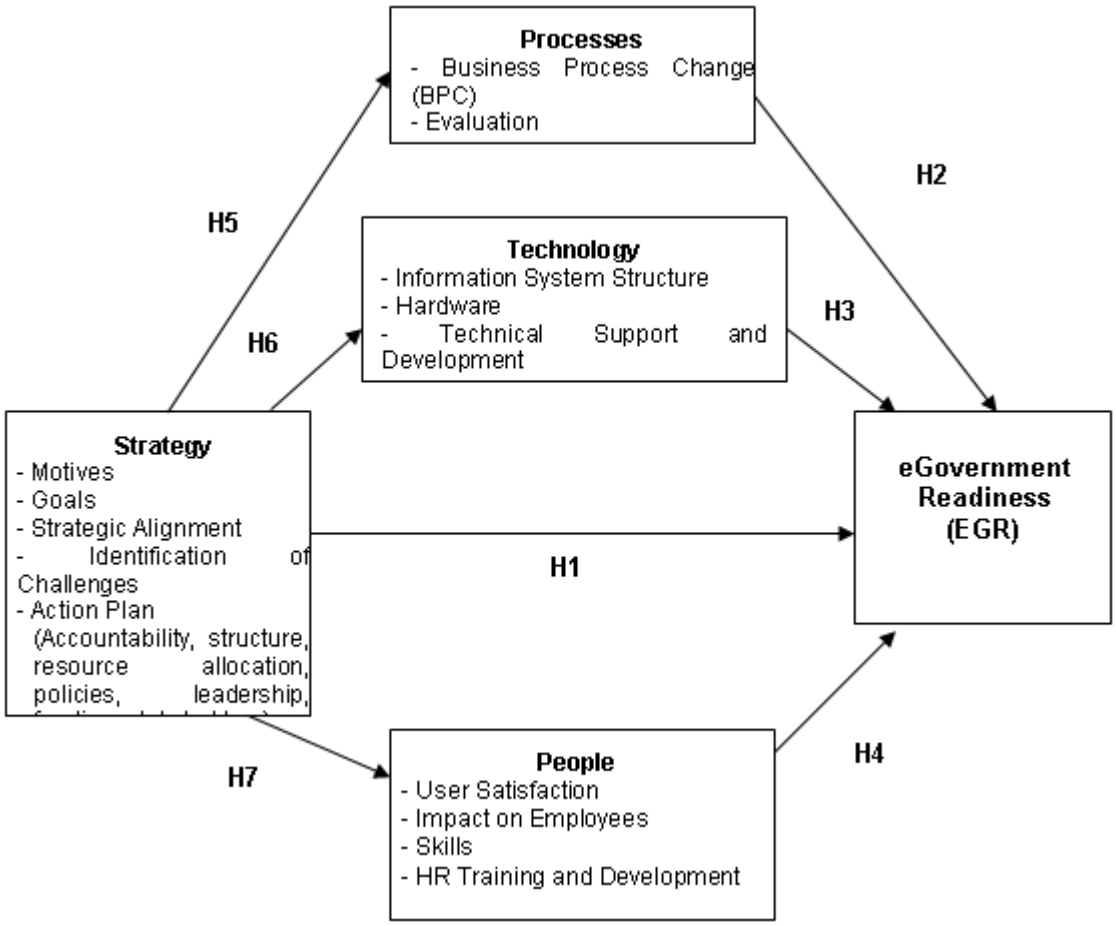

Figure 1: e-Government Readiness (EGR) Framework

The following lines explain the theoretical background from which all constructs under each dimension are derived.

3.1.1 Strategy

The need to set out a robust strategy for e-Government is a major factor in reaching a successful e-Government adoption (Reffat, 2003; Fletcher, 1999). An efficient strategy should identify first the main drivers for implementing e-Government (Working Group on e-Government in the Developing World, 2002). Recognizing these drivers highlights their importance, and helps in setting an appropriate action plan. e-Government strategy should also set a number of goals (Forman, 2002) -to justify its cost and to check the extent to which these goals were achieved - and should identify potential challenges (Margetts and Dunleavy, 2002): technological, administrative, legislative, economic, and political (Pilipovic et al., 2002). Highlighting challenges at an early stage helps in setting appropriate solutions (Weerakody et al., 2005) with the right priorities (Chen and Knepper, 2005). An e-Government strategy should also be aligned with the organization's business strategy, referred as strategic alignment, (Beaumaster, 2002; Baets, 1992; Bowman et al., 1983; Das et al., 1991; Henderson and Venkatraman, 1993). Strategic alignment impacts overall organization and business performance (Xia and King, 2002; Croteau et al., 2001), and helps in perceiving higher payoffs from IT (Tallon et al., 2000).

In addition, an e-Government strategy should set an action plan (UNDESA, 2003a; WASEDA University, 2006) including accountability (Navarra and Cornford, 2003; Heeks, 2001), organization's structure (Snellen, 2000; Baum and Maio, 2000), resource allocation (Fletcher, 2003), IT policies and procedures (Powell and Dent-Micallef, 1999; Zahra and Covin, 1993), and leadership (WASEDA University, 2006; NSW, 2001). Action plan should also investigate funding sources (WASEDA University, 2006; NSW, 2001), and identify e-Government different stakeholders (Mitchell et al., 1997; Tennert and Schroeder, 1999) in order to determine their roles (Frooman, 1999; Bryson and Alston, 1996) as well as the value to be reflected on each of them (Aldrich et al., 2002; Traunmüller and Wimmer, 2003; Sprecher, 2000; West, 2000). Finally, an action plan should develop means to promote e-Government to build awareness among all stakeholders (Hu et al.,

2005; WASEDA University, 2006). Table 2 presents the various suggested constructs of the e-Government strategy dimension.

Table 2: Main constructs of "Strategy"

Strategy
Motives
Goals
Strategic Alignment
Identification of Challenges
Action Plan
Organization (Accountability, Structure, Resource allocation, IT policies and procedures, Leadership)
Funding resources
Stakeholders (Identification, Role, Value on each one)
Promotion

Showing the value of e-Government strategy along with its different underlying items leads us to the following hypothesis:

Hypothesis 1 (H1): e-Government strategy impacts EGR of the organization

3.1.2 Processes

Processes to be undertaken by an e-Government initiative are classified into two main categories: business processes change and e-Government evaluation (see table 2). Several studies highlight the value of business process change in e-Government success (Scholl, 2003; Kettinger et al., 1997; Pardo and Scholl, 2002; Heeks, 2001; Seybold, 1998). First, the motives for change should be determined (Scholl, 2005), and the focal areas where these change should take place (Harkness et al., 1996; Kettinger and Grover, 1995; Balutis, 2001). Business processes should also be defined, documented and streamlined (Rimmer, 2002; Guo and Lu, 2005; Baum and Maio, 2000) to improve information flow within the organization.

Business processes should also be integrated internally, and with other public agencies as well (Accenture, 2005; Ho, 2002; Moon, 2002; Tapscott, 1995; Chen and Knepper, 2005; Rimmer, 2002; Layne and Lee, 2001).

Furthermore, the framework considers evaluation of e-Government performance as a systematic approach to be performed periodically. Evaluation should always compare plans with real situations (Heeks, 2003); this aids in rectifying deviations from the plans at an early stage. Evaluation should also take into account the use of e-Government services by citizens (Gefen et al., 2002) and ICT usage by the employees in the organization (CSPP, 2000; Liu, 2001; DeLone and McLean, 1992; Marchionini et al., 2003; Schedler and Scharf, 2001). It is also essential to conduct periodic evaluations to understand how citizens perceive e-Government from different perspectives such as usefulness and ease of use (Davis, 1985, 1989), satisfaction (DeLone and McLean, 1992; Livari and Ervasi, 1994; Cyert and March, 1963; Downing, 1999; Bailey and Pearson, 1983; Igbaria and Nachman, 1990), and trust (Adams, 1999; Edmiston, 2003; Chen and Knepper, 2005; Gefen et al., 2002; Tassabehji, 2005). Periodic evaluations should also be extended to investigate employees' perceived usefulness and ease of use (Davis, 1985, 1989), and satisfaction (DeLone and McLean, 1992; Bailey and Pearson, 1983; Davis, 1985, 1989; Igbaria and Nachman, 1990; Rai et al., 2002; Seddon, 1997; Seddon and Kiew, 1996; Seddon et al., 1999; Wilkin and Castleman, 2003). Finally, evaluations should be performed to assess the development of the impact of e-Government on all stakeholders (DeLone and McLean, 1992; Seddon, 1997). Table 3 shows the main constructs of the processes dimension.

Table 3: Main constructs of "Processes"

Processes
Business Process Change (BPC)
Motives of BPC
Focal areas of BPC
Definition, documentation and streamlining of Business processes
Vertical integration
Horizontal integration
Evaluation
Design/reality gap
Usage (Citizens, Employees)
Citizens' feedback (Perceived usefulness, Perceived ease of use, Satisfaction, Trust)
Employees' feedback (Perceived usefulness, Perceived ease of use, Satisfaction)
Impact on stakeholders

Highlighting the importance of processes as an integral factor in affecting e-Government enables us to set the second hypothesis:

Hypothesis 2 (H2): Organizational processes impacts EGR

3.1.3 Technology

Evidently, technology constitutes an important factor influencing e-Government success (NSW, 2001). Technology comprises IS structure, hardware, and service quality (see table 4). Information systems structure covers information quality (DeLone and McLean, 1992; Bailey and Pearson, 1983; Ahituv, 1980), system quality (DeLone and McLean, 1992; Bailey and Pearson, 1983; Bhimani, 1996), Web presence quality (UNDESA, 2005; West, 2000, 2006; WASEDA University, 2006; Accenture, 2002, 2005; Turban et al., 2002; Liu and Arnett, 2000; DeConti, 1998; Eschenfelder et al., 1997; Burgess and Cooper, 1990; Smith, 2001; Boon et al., 2000; Farquhar et al., 1998; Fogg, 2002; Fogg, et al., 2002; Hamilton and Chervany, 1981; Ho and Wu, 1999; Kossak et al., 2001; Swanson, 1986; Wan, 2000), and security measures (NSW, 2001; Ben Abd Allah et al., 2002; Conklin and White, 2006; Boudriga, 2002). Technological dimension should also consider the quality of the hardware (Victoria, 2002), and the technical support and development provided by the IT department to the entire organization referred as service quality (CSPP, 2000; Woodroof and Burg, 2003; Pitt et al., 1995; Li, 1997; Wilkin and Hewett, 1999; Wilkin and Castleman, 2003).

Table 4: Main constructs of "Technology"

Technology
Information Systems Structure
Information quality (Content, Availability, Accuracy, Timeliness, Convenience, integration [vertical, horizontal, Internet])
System quality (Reliability, Ease of Use, Accessibility, Usefulness, Flexibility, integration [vertical, horizontal, Internet]
Web presence quality (Usability, Layout, Navigation, Consistency, Content, Number of services, Stage [presence, interaction, transaction, transformation])
Security measures (Data and software protection, data transfer over networks, Safety of electronic payment)
Hardware (Quality, Integration [vertical, horizontal])
Technical Support and Development (Reliability, Competence, Responsiveness, Timeliness, Communications, Commitment, Access)

The effect of technology on EGR presented in the literature directs us to the third hypothesis:

Hypothesis 3 (H3): Technology in the organization impacts EGR

3.1.4 People

People are one of the main factors in the success of e-Government (NSW, 2001). Several constructs exist in this dimension such as, user satisfaction (DeLone and McLean, 1992; Bailey and Pearson, 1983; Davis, 1985, 1989; Igbaria and Nachman, 1990; Rai et al., 2002; Seddon, 1997; Seddon, and Kiew, 1996; Seddon et al., 1999; Wilkin and Castleman, 2003), assessing satisfaction of e-Government from the part of employees using IT. Also, it is vital to detect the impact of e-Government on them (DeLone and McLean, 1992; Seddon, 1997). Also, employees' skills should be taken into account such as, adaptation to change (Bertelsmann Foundation, 2002), proficiency in using IT (ICMA, 2002); ability to communicate with other employees within and outside the organization (Powell and Dent-Micallef, 1999), and providing an adequate service to citizens (Accenture, 2002, 2005). Finally, there should be a special focus on the training to be provided to the employees in order to develop their various skills (Baum and Maio, 2000). Table 5 presents the various suggested constructs under the people dimension.

Table 5: Main constructs of "People"

People
User Satisfaction
Impact on employees
Skills (Adaptation to change, Use of technology, Integration, Customer service)
HR Training and Development

Recognizing the value of people in e-Government readiness guides us to the fourth hypothesis:

Hypothesis 4 (H4): People in the organization impact EGR

3.1.5 Relation between strategy, and Processes, Technology, People

The study argues that all three factors: processes, technology, and people, are affected by e-Government strategy since this strategy comprises a number of aspects that cause major changes in the mentioned three factors. An efficient e-Government strategy, if followed, should have a direct impact on them, which leads to the following three hypotheses:

Hypothesis 5 (H5): e-Government strategy impacts processes in the organization

Hypothesis 6 (H6): e-Government strategy impacts technology in the organization

Hypothesis 7 (H7): e-Government strategy impacts people in the organization

4. Country profile

Egypt has taken an e-Government initiative since the introduction of the Ministry of Communication and Information Technology (MCIT) in 1999, as part of its plan to turn Egypt into an information-based society. To reach such objective, Kamel et al. (2002) believe that Egypt IT strategy should be based on the following building blocks: people, training, information, technology and the partnership between the public and private sector. The vision of e-Government initiative in Egypt is "delivering high quality government services to the public in the format that suits them". Such mission relies mainly on three principles that include: 1) citizen centric service delivery; 2) community participation; and 3) efficient allocation of government resources. With the new cabinet announced in Egypt in July 2004, a confirmation and commitment of Egypt to capitalize on the evolution of ICT for the purpose of government services and processes improvements were re-enhanced (Darwish et al, 2003). The official inauguration of the Egyptian e-Government portal (**www.egypt.gov.eg**) took place in 25 January 2004 and was attended by Bill Gates during his first visit to Egypt, as Microsoft was chosen to be in charge of the project's implementation. Some services were placed in the portal to pilot test the project such as telephone e-billing, birth certificate issuing, etc.

Egypt's e-Government program has identified a number of objectives to realize a successful implementation of e-Government and that includes (but not limited to): 1) tailoring government services to meet citizens expectations; 2) creating a conducive environment to investors (local and international); 3) availing accurate and updated government information; 4) increasing government efficiency through modern management techniques and new working models; 5) reducing government expenditure; and 6) fostering local competitiveness and increasing globalization readiness.

Egypt e-Government program is in continuous progress; this can be deduced by monitoring its rank in several studies conducted regularly to evaluate EGR worldwide. For example, in the global e-Government readiness by Darrell West, Brown University (2006), Egypt ranks 62nd over 196 countries compared to 69th in

2005. Similarly, in UNDESA e-Government readiness report (2005), Egypt ranks 99th over 193 countries while it ranked 136th in 2004.

It is expected that citizens will rely more on online services due to the growing number of: Internet users (increased from 300,000 in October 1999 to 9.29 million in April 2008), fixed telephone lines (increased from 4.9 million in October 1999 to 11.28 million in December 2006), and mobile users (increased from 654 thousands million in October 1999 to 33.285 million in December 2006) (MCIT, 2008).

5. Case study

The focus of the study is on the internal factors affecting EGR in a public organization. It is a contextually specific single-site empirical study in cooperation with Montaza District (MD), Alexandria. Further studies are already taking place on additional cases in other contexts to produce results that can be compared with those obtained from this study.

5.1 Description

Montaza district (MD) is located in Alexandria (one of Egypt's 29 governorates located in North Egypt on the Mediterranean). In general, metropolitan governorates, such as Alexandria are divided into districts. Decision making in each district, concerning financial and administrative affairs, is performed across various levels reflecting different levels of responsibilities. For example, detailed responsibilities such as executing the governorate strategy, dealing with the district's citizens, and limited investment allocation are managed by the District Executive Committee headed by the District Head. Higher level decisions are carried out by each Governorate Executive Committee meeting that is held monthly and headed by the Governor. Districts Heads are key members of this committee along with representatives from 14 different service sectors such as health, education, etc. and other entities representing other authorities in the governorate. Governors submit periodical reports to the Minister of Local Development who heads the Governors' Committee composed of the Minister himself and the 29 Governors every three month. It is important to note that the Minister reports directly to the Prime Minister (Mold, 2008; Ahmed and Hassan, 2007; interviews with consultant of the Minister of Local Development and with MD Head).

MD's area is 92 squared kilometers; it has a population of 1.023 million, which is the highest population among the other five districts of Alexandria, constituting around 25% of the total population of Alexandria (4.110 million). MD offers a total of 69 services to citizens such as, issuance and renovation of permits (stores, buildings, digging), issuance and re-issuance of certificates, etc.

The district started its e-Government program since 2003 focusing on using ICT to reach two main objectives: simplify and speed-up the procedure in providing services to the citizens in case of physical interaction, and enable citizens to get the services remotely. The first objective was realized to a great extent by placing public kiosks, in several convenient locations, doing any service with MD on behalf of the citizen; and by making 38 services (around 55% of total services offered) instant ones, i.e. to be completed in 30 minutes only or less. More services are to be transferred to instant ones. The second objective was attained by launching a Web site for MD (**www.montazaonline.com**). Most services are offered online, but electronic payment is still not implemented, which means that for services requiring fees, payment could be upon delivery, or citizens have to go to MD for payment. Also, citizens cannot submit documents electronically, but they can see the documents required for each service to be prepared before visiting MD. Other important services are provided through the website such as, check the status of a property, track the status of the services applied for, apply and follow-up services from other public entities making MD play an intermediary role. The website gives also its visitors insight on most issues related to the district: events, and attraction places.

5.2 Methodology

A conceptual framework is proposed to investigate the factors affecting EGR. In order to validate it, a case study research strategy is selected since it is a well known approach for exploratory, theory-building research (Eisenhardt, 1989) allowing in depth investigation (Yin, 1993; Walsham, 1993; Pettigrew, 1990). Both qualitative and quantitative data were combined. Qualitative data was collected through in-depth unstructured and semi-structured interviews (Yin, 1994) with top management (head of district), key people (IT manager and webmaster of the district's official website), and with a number of employees. Interviews were combined with observations and a review of MD documentation and archival records to enable validation of the questionnaire findings through triangulation (Yin, 1994; Saunders et al., 2000; Ragin, 1987).

Quantitative data was collected through distributing a questionnaire on a sample representing employees working in administrative positions.

Based on the interviews conducted with e-Government responsibles, and on observation of the work environment, it was concluded that the number of employees suitable to participate in the study would not exceed 140 (computer users, senior management, IT specialists, and administrators), because the rest of the employees are computer illiterate which makes them unable to respond to the different parts of the questionnaire. The small number of respondents enabled a direct contact with the employees when answering the questionnaire.

5.2.1 Questionnaire structure

The questionnaire used in this research is adopted from three previous studies: Koh and Prybutok (2003) and Liu (2001), developed to measure EGR in City of Denton, Texas, and UNDESA (2003a), addressed to public agencies in any country to assess EGR. Several questions were modified and others are added to reflect all the measuring constructs that exist in the suggested EGR framework.

The questionnaire consists of six sections: the first four sections measure employees' perceptions toward the four suggested dimensions of the model: strategy, processes, technology, and people. Each question in each section reflects a measurement construct under each dimension. The research variables are measured in a 7-point Likert's scale, with 1 as strongly disagree, and 7 as strongly agree (appendix A shows the first part of the questionnaire containing first an introduction explaining some terms and definitions included in the questionnaire, and second, questions of the first section concerning the strategy dimension). The fifth section contains only one question requesting employees to express their view regarding the extent to which their organization is ready for e-Government. Finally, the sixth section contains personal questions about each subject (e.g. age range, gender, experience with IT, etc.). The questionnaire was translated to the Arabic language because the majority of the employees do not have adequate proficiency in the English language.

The number of respondents was 81 employees, and the number of invalid responses was 10, which constitutes a response rate of 87.6%. Invalid responses were discarded because they were incomplete because of three reasons: The first section concerning the strategy dimension was hard for the employees to reply to because most of them do not have a complete idea about all the issues stated under it. Some of them left this section because they could not perceive its relevancy to them; the second reason was due to the length of the questionnaire (consisting of 11 pages). Some of them completed 4 or 5 pages and were not interested in terminating it; the third reason is due to their fear to express any negative perception towards any item raised in the questionnaire.

5.3 Study findings

5.3.1 Demographics

The number of females surpasses the number of males (60 vs. 11) constituting 84.5% of the total sample), and 45% of the participants fall in the age range 20 to 30. The number of participants having a four-year college degree is almost equal to those with a two-year high/technical institute degree, having an average IT experience of 6 years, and around 18% of them hold managerial positions. The average employment period of the sample taken is 9.6 years, with an average of 8 years staying in their current positions. Among the employees who have been working for four or more years in DM, 46.5% remain in their current position. On average, they work 35.6 hours per week (around 7 hours per day), and use IT 28.7 hours per week (around 5 hours and 40 minutes per day).

Participants rated their skills in using PC in general as average, and below average in using email and the Internet. Most respondents do not have access to email (an average of only 11.3%), or to the Internet (an average of only 18.3%); but a large number have a PC access (81.7%). 88.7% of participants use MS Word, and 52.1% use MS Excel. Participants revealed also that the software they mostly needed training on is MS Power Point (94.4%), then MS Excel (83.1%). Regarding the training courses they attended, MS Word is the most offered course (for 70.4% of the respondents), followed by MS Excel (43.7%), and MS Power Point (19.7%).

5.3.2 Testing research model

When investigating employees' knowledge about the four dimensions of the proposed research model: strategy, processes, technology, and people, many employees where unaware of many issues related to IT strategy at MD. The study findings show that the average score of all strategy constructs is 5.9, and all processes constructs is 5.32 on a scale from 1 (strongly disagree) to 7 (strongly agree). The average score of technology is 5.11 on a scale from 1 (far short of expectations) to 7 (greatly exceeds expectations). The fourth dimension, people, is divided into two main sections: the first on a scale from 1 (strongly disagree) to 7 (strongly agree) comprises user satisfaction (average = 5.58), impact on employees (average = 5.88), and skills of employees (average = 5.86); the second section is about the quality of IT training provided to the employees (average = 5.08) on a scale from 1 (far short of expectations) to 7 (greatly exceeds expectations). Finally, the average score of EGR is 5.95 on a scale from 1 (extremely unready) to 7 (extremely ready).

Testing the research model is performed following the four following steps adapted from the study of Liu (2001): 1) carry out a factor analysis to extract and group dimensions in each construct, 2) test multi-collinearity among these dimensions to determine the strength of the relationship between them, 3) check reliability and validity of the model, and 4) test the partial models.

5.3.3 Factor analysis

Using SPSS version 13.0, a factor analysis was performed, and resulted in an elimination of a number of constructs extracted under each construct. Using Varimax with Kaiser Normalization rotation method, items with a loading number greater than 0.5 on one factor, and less than 0.5 on all others were retained. Table 6 shows the extracted constructs corresponding to each dimension after final factor analysis.

Table 6: Final factor analysis for each construct

Construct	Dimension	No. of Questions	No. of Iterations
Strategy	Leadership	4	7
	Funding	3	
	IT Objectives and Accountability (ITObject)	3	
	Strategic Alignment (StrAlign)	1	
	IT Strategy (ITStrat)	1	
Processes	Evaluation of Citizen Feedback (CitFeed)	4	5
	Evaluation of Citizen Feedback (EmplFeed)	4	
	Business Process Change (BPC)	3	
Technology	Web Quality (WebQual)	11	7
	Information and System Quality (InfoSysQ)	11	
	Technical Support (TechSupp)	9	
	User experience with Technology (UserExp)	4	
	Security	4	
People	HR Training and Development (HRTD)	7	5
	Personal and Customer Service Improvement (P&CS)	2	
	Personal Flexibility (PersFlex)	2	

5.3.4 Degree of multi-collinearity

Presence of a high degree of multi-collinearity among constructs in each dimension results in several problems (Dielman, 1996); this dictates the need to investigate the strength of relationships between them. Correlation tests show that all construct pairs are not highly correlated (all pair correlation is less than 0.5), proving the absence of multi-collinearity since many researchers suggest that multi-collinearity exist if correlation between each determinant pair is greater than 0.75 (Liu, 2001).

5.3.5 Reliability and validity

To assess the reliability of the model, a Cronbach's alpha is used since it is the most common method of estimating the reliability of an instrument (Zmud and Boynton, 1991). Results obtained show that all alpha coefficients exceed 0.80 (Nunnally, 1978), indicating a high level of internal consistency or homogeneity among the constructs under each dimension (Straub, 1989) (see table 7).

Table 7: Cronbach's Alpha Scores for the research model

Constructs	Cronbach's Alpha	Dimensions	Cronbach's Alpha
Strategy	0.9658	Leadership	0.9733
		Funding	0.9899
		ITObject	0.9112
		StrAlign	0.9777
		ITStrat	0.9556
Processes	0.9649	CitFeed	0.9334
		EmplFeed	0.9800
		BPC	0.9865
Technology	0.9887	WebQual	0.9986
		InfoSysQ	0.9856
		TechSupp	0.9905
		UserExp	0.9136
		Security	0.8993
People	0.8976	HRTD	0.9378
		P&CS	0.9865
		PersFlex	0.9342
EGR	0.9785	EGR	0.9785

Convergent validity is also checked to ensure the extent to which all group of constructs indicate the same dimension as well as the degree of compatibility of multiple measures within the same dimension (Kerlinger, 1986). Table 8 shows that all correlations between these constructs are higher than 0.568, ranging from 0,568 to 0.996 proving the existence of convergent validity.

Table 8: Significant level of correlations in the research model

Construct	Dimension	Correlations range	Significant level
Strategy	Leadership	(0.578, 0.886)	0.01 (2-tailed)
	Funding	(0.656, 0.906)	0.01 (2-tailed)
	ITObject	(0.745, 0.996)	0.01 (2-tailed)
	StrAlign	(0.568, 0.784)	0.01 (2-tailed)
	ITStrat	(0.731, 0.915)	0.05 (2-tailed)
Processes	CitFeed	(0.664, 0.894)	0.01 (2-tailed)
	EmplFeed	(0.568, 0.919)	0.01 (2-tailed)
	BPC	(0.710, 0.899)	0.01 (2-tailed)
Technology	WebQual	(0.711, 0.857)	0.01 (2-tailed)
	InfoSysQ	(0.597, 0.923)	0.01 (2-tailed)
	TechSupp	(0.665, 0.978)	0.05 (2-tailed)
	UserExp	(0.776, 0.853)	0.05 (2-tailed)
	Security	(0.634, 0.952)	0.01 (2-tailed)
People	HRTD	(0.701, 0.875)	0.01 (2-tailed)
	P&CS	(0.832, 0.975)	0.05 (2-tailed)
	PersFlex	(0.774, 0.933)	0.01 (2-tailed)

5.3.6 Partial models

Testing research hypotheses was performed using LISREL version 8.72 due to its powerful ability in identifying relations among dimensions (or latent variables), each comprising several measurable constructs (or observed variables). Findings are presented in table 9.

Table 9: Partial research model results

Hypothesis	Chi-Square	df	P-Value	Significance	Result
H1 Strategy→EGR	18.53	14	0.17969	Weak impact	Accepted
H2 Processes→EGR	5.26	10	0.87330	High impact	Accepted
H3 Technology→EGR	11.36	14	0.65767	High impact	Accepted
H4 People→EGR	0.00	0	1.00000	Very high impact	Accepted
H5 Strategy→Processes	25.67	19	0.13960	Weak impact	Accepted
H6 Strategy→Technology	33.43	43	0.49542	Modest impact	Accepted
H7 Strategy→People	13.8	17	0.79496	High impact	Accepted

5.4 Discussion

The average score of each of the four research dimensions is relatively high, ranging from 5.08 to 5.95, contradicting some of the data collected from the interviews that reveal employees' negative impressions towards IT and integration of processes. This high average score could be attributed to a cultural aspect that characterizes Egyptians when responding to surveys; feeling uncomfortable in expressing negative impressions towards a person or even a concept (Manawy, 2006) especially in case of surveys related to their work environment.

Comparing the results obtained with the research hypotheses shows that findings confirm all research hypotheses but with varying strength; for example, looking at the weights of the factors affecting EGR, the study findings reveal that IT strategy does not have a strong impact on EGR (H1). This could be due to the unperceived value of IT strategy and to the lack of vision and long term planning especially in the public sector due to political, economical, and social inconsistencies. This could also be related to the fact that employees do not perceive the high effect of IT strategy on EGR because most of them not only are not involved in IT strategy formulation, but are not even aware of its existence (as revealed by the interviews conducted with them). This ascertains the direction of the research in choosing the employees as the sample to reply to the questionnaire because their feedback and participation are rarely investigated.

The strong effect of processes on EGR (H2) is easily perceived, since improvements in services and in government internal relationships could not be realized without an attempt to examine and simplify all business processes, and to monitor continuously IT progress and impact. Also, the impact of technology on EGR (H3) proves to be high because the technology value is easily apparent to the employees; evidently e-Government could never exist without applying ICT. Finally, the effect of people on EGR (H4) has the highest weight (P-value = 1.00), ensuring that people is the major factor in the success of any information system.

Looking at the impact of IT strategy on processes (H5), on technology (H6), and on people (H7), reveals that processes are the least one affected. Interviews conducted with employees show that IT strategy does not put high value on changing business processes or on considering the evaluating IT performance as a regular process. IT strategy has a modest effect on technology because first, there is always a common understanding that IT strategy is not a business issue, and second, since employees are not involved during development phases, they cannot perceive a high impact of strategy in affecting ICT. Having the strongest effect on people means that IT strategy, when formulated, considers people as a major part in its components, attempting to improve their skills (interviews with employees confirm that training courses are easily provided especially in IT). In addition, IT strategy has a strong impact on employees' behaviors due to the hierarchical structure of the public sector which drives people to respond to changes approved by top management.

5.5 Limitations

The study investigates a single case only, with a small sample size (71) restricting the generalization of the findings over all public organizations in Egypt. Further studies should be performed on one (or more) cases.

Moreover, the data collected depends on the opinions of the employees, without considering other stakeholders, such as citizens and business partners. Additionally, employees feedback could be incorrect due to several reasons: 1) culture: Egyptians are always reluctant to reveal any negative attitude when responding to surveys, and especially towards issues related to their work environment despite assuring them of the anonymous nature of the questionnaire; 2) skills and awareness: participants have different levels of expertise and familiarity with the research topic; 3) questionnaire's length: which could lead to less valid answers due to fatigue or unwillingness of participants to seriously answer a large number of questions.

6. Conclusion

In order to reap e-Government benefits, policy makers should conduct regular evaluation on electronic government readiness (EGR) to pinpoint weaknesses and provide appropriate solutions. This article aims to develop an instrument assessing EGR in a public organization. First, it reviewed previous appraisal models of electronic readiness and EGR, highlighting their shortcomings. These models - along with other models of IS and eCommerce success – were then used as theoretical foundations for the proposed framework.

The suggested framework assessed EGR in a public organization covering all internal factors affecting EGR. It classified these factors into four main dimensions: strategy, processes, technology, and people. A number of measurement constructs were proposed under each dimension. The first stage of testing the framework was performed through conducting a case study on a public organization in Egypt by getting its employees' perception on ICT and EGR in their organization. The study examined the weight of each of the four dimensions on impacting EGR and the relationships between them. Further studies on additional cases are taking place. Comparing all findings could lead to the development of a generic framework.

The study findings confirmed the research hypotheses indicating that all four dimensions affect EGR but with different weights. Results obtained revealed an under estimation of the value of e-Government strategy on EGR compared with the great effect of people on EGR. This necessitates the need to look at e-Government from a strategic perspective. Moreover, results showed that e-Government strategy had a great impact on people. This means that although e-Government strategy does not have a major direct effect on EGR, it has an indirect effect through the people dimension. Due to the high impact of people in affecting EGR, the study recommends that more awareness should be provided to employees about e-Government strategy in the organization stressing on their involvement during its formulation. This would ensure their support and willingness leading to the success of the overall e-Government project.

Results also showed that e-Government strategy does not have a high impact on processes; which dictates the need to integrate e-Government processes with the organization's business processes, and to consider e-Government evaluation a regular processor to monitor its efficiency and effect on all stakeholders.

As a conclusion, the research recommends that in studying various e-Government efforts and initiatives, one should take into consideration all internal e-Government building blocks: strategy, processes, technology, and people.

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