Jordan's E-Government Program: A User Centered Approach

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Received on Oct. 14, 2008 Accepted for publication on March 12, 2009

Abstract

Research in the area of e-government indicated a big gap between governments’ objectives and customers' needs. This research utilized opinions of 25 experts in ICT area and 108 users of the Jordanian e-government portal to explore two main objectives. The first was to review the Jordanian e-government experience through the examination of the existing portal utilizing experts’ opinions. The result of this stage concluded that the portal serves as an informational website, which lags behind among the Arab countries experiences. The second objective utilized the technology acceptance model (TAM) to test the acceptability of users of e-government services in Jordan. E-government was well accepted by citizens as they evaluated high its usefulness and ease of use and showed a high intention to use the service. Finally, trying to link the e-government strategy to the results of this research, this paper recommended many areas that need to be researched. Conclusions and recommendations of this research are stated at the end of this paper.

Keywords: E-government, Users' acceptance, TAM, Expert evaluation, Jordan.

Introduction

The latest research in the area of e-government indicated a big gap between governments’ objectives and customers' needs. The area exceeded the perception of informational website to more complicated systems that combine customer relationship management (CRM) with transactional website capabilities. It seems that the final say about using a technology (or an information system) is totally dependent on users. E-government experience in Jordan is still young and needs support from academia. The basic objectives of the e-government program in Jordan are centered on citizens' services and needs, and could be achieved through the utilization of later stages of e-government theories (transactional stage and beyond). With the huge and pervasive usage of information and communication technology (ICT) in community, still, some aspects and technologies are slow in their utilization and dissemination. Jordan embarked on a technological era where the ICT sector is the fastest growing sector in the last few years. As an example, the contribution of the sector is 10 % while the agriculture sector contributed only 4% to the Jordanian economy. Moreover, the penetration of mobile technology in the Jordanian market increased from 8.1% in 2000 to 57% in 2005 with

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The Internet penetration is slower than the mobile penetration as the number of Internet users was 1.25M in 2008, where growth rate of Internet usage went from 2.4% in the year 200 to 18.2% in the year 2008 [2]. Jordan e-government program is one of the ambitious programs that utilizes the ICT sector capabilities and pushes forward a program for governmental reform and effectiveness. The e-government portal offered three main services: the first for citizens, the second for businesses and the third for government itself (URL: http://www.jordan.gov.jo). E-government programs are still in their early stages in the Arab world [3], but varied among different countries in the region. The Jordanian experience was supported by his Majesty King Abdullah initiative in 1999, and continued its progress until the government launched its portal in 2006.

One of the definitions for E-government is "the use of e-commerce to deliver information and public services to citizens, business partners, and suppliers of government entities, and those working in the public sector" [4, p. G-4]. Another definition by the World Bank states that e-government "refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management" [5]. Silcock [6] emphasizes the integration and seamless services perspective, which can be an additional and important component to the listed definitions by Turban and other parties. Tools that help in the facilitation of e-government processes can be: e-mail, websites, web mapping, visualization, planning support systems, technology for public participation, online planning portals, content management systems, handheld devices, permitting and zoning systems [7], and website accessibility tools [8]. E-government is all about customer service, social inclusion and democracy and accountability [9]. King stresses the importance of change capabilities within the body of government [9].

This study attempts to explore the status of the e-government portal in Jordan using an expert opinion method. The objective from this stage is to evaluate the status of e-government portal and measure it against specified key factors proposed by the literature. Moreover, based on previous literature, users are the center of e-government process; in fact users are the center of any system acceptance. This paper discusses issues related to e-government acceptance and utilizes a well spread model in the literature (the TAM). The second objective of this research is to evaluate users’ acceptance of the Jordanian e-government website using an instrument adapted for this purpose.. Finally, this paper reviews the dimensions of e-government strategy and proposes a research plan to better improve the system functionality and proceeds with the reform intended. The e-government strategy needs to be linked with what really users want, where this perspective of user-centered approach is the focal point of this work. The following section will cover the literature related to technology acceptance and e-government applications. The third section will cover the expert evaluation results and discussion, followed by the Jordanian e-government portal acceptance section. Finally, a review of the strategy implemented by the government and the researcher's conclusions and recommendations is summarized at the end.
The E-government Implementation Models

The United Nations Development Programs (UNDP) proposed a four stage model for implementing e-government in Arab countries as follows: posting information stage, two way communication stage, exchange of value stage, and integrated services stage [10]. As stated, models that explore e-government stages (phases) are all revolving around a sequential process that starts with a basic stage of information dissemination followed by other capabilities depending on two aspects: the readiness of the user and the infrastructure and portal characteristics [11] [12] [13] [14]. Layne and Lee [11] proposed a four stage model that starts with catalogue stage, where a presence and information dissemination is the start, followed by a transaction stage where a two way interaction happens between government and users. The model was extensively researched by more than one study, where more than one study discussed and recommended such model for a better implementation of an e-government project [15]. The last two stages provide an opening for vertical and horizontal integration.

Later, Anderson and Henriksen [13] extended this model with their Public Sector process Building (PPR) where they emphasized the role of users in the process through a customer center dimension vs. an activity centered one. Wescott [16] proposed a six stage model where internal network and e-mail capabilities are established before the informational stage, also, the last transformation stage is split into two where a digital democracy is established before joining up the government.

E-government projects still face problems regarding implementation and usage, even with the improved technological support and the massive capabilities of ICT infrastructure. Thus, e-government initiatives were not that easy success nonetheless faced many obstacles and delays. Most of the experiences, that are now prosperous, faced problems during the implementation stage and even still facing difficulties in advanced stages. Examples of such stories reported in the literature: the differential success in implementation in Slovenia [17] and Australia [18], the psychological barrier in East Asian countries [19], the lack of coordination and the high cost of Internet access in Bangladesh [20]. On the other hand, success stories are evidenced in many countries like Singapore [21], in the state of Andhra Pradesh in India [22], and the united states, Denmark, United Kingdom, Sweden, Republic of Korea, Canada, Finland Norway [23]. In relation to the Arab world, Al-Omari [24] reported the success of United Arab Emirates and Egypt as leading Arab functional e-government portals.

E-government in Jordan

The Jordanian government started its initiative to pursue e-government services since the year 2000 and launched its portal in the year 2006. Once the E-government portal is open for public, the government started its operations via the web where interactions with citizens, businesses and other governmental entities can be initiated. The e-government portal is administered by the National Center for Information Technology, which was established in 1990 and reformed in 2003 to be responsible for the governmental gate of ICT sector jointly with the Ministry of Information and Communications Technology.
The vision statement of the e-government in Jordan was to create a society where electronic government is a contributor to the economic and social development of the kingdom (E-Government Strategy, a report published in 2006). With proper guidance and support from the USAID, the project started within the Ministry of Information and Communication Technology body and in March 2002 initiated a program (within National Center for Information Technology) that coordinated the process, and finally in 2006 the project started its work with many initiatives and six ministries connected [25]. By the end of 2005, 12 ministries where connected and nearly 2000 public employees would have training related to e-government services [26]. The e-government life cycle adopted by the program administration indicates a four stage program with the following stages: information, communication, transaction and transformation [27].

The lag of e-government project in Jordan was attributed to many reasons. One of the most significant obstacles was the reflection of the portal processes on government agencies that would be difficult because of the difficulty of translating suggested policies that needs parallel reforms to reach good governance [28]. Other causes were reported like: infrastructure constraints and low penetration of Internet services, privacy and security, and lack of awareness and legal framework [24].

The E-government Acceptance Model

Regardless of the widespread of e-government initiatives and the huge demand on this service, still many studies indicate a lag in acceptance of such paradigm shift. Accenture's fifth annual e-government study [29] found that the top trend in e-government area was that its advances are diminishing, and promoting usage is slowing down which indicates a slow down in acceptance. Like any other technology, accepting e-government by users is essential. This study focuses on citizens as users and do not explore other outlets of e-government like the relationship between governments and businesses (G2B) and government and other government agencies (G2G). This study applies the Technology Acceptance Model (TAM) by Davis [30] to explore users’ acceptance of the e-government services.

Evolving from the Theory of Reasoned Action (TRA), the TAM model gained a reputation as a model that addresses individuals’ behaviors and attitudes towards technology. Several researchers have tested the TAM, modified its components, and replicated it in different situations and environments, yet the original TAM survived those tests with minor changes. The original TAM had three major components: perceived ease of use, perceived usefulness and computer usage. Davis identified “usage” as an indicant of technology acceptance. The main objective of the Davis study was to establish a validated instrument of perceived ease of use and perceived usefulness. In his article, Davis identified “usage” as an indicator of technology acceptance. Perceived Usefulness (PU) is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance,” and Perceived Ease Of Use (PEOU) is defined as “the degree to which a person believes that using a particular system would be free of effort” [30, p. 320]. In addition, the TAM includes “attitudes” and “behavioral intentions” to use the technology.
The original TAM is the result of two major studies done by Davis [30] and Davis, Bagozzi and Warshaw [31]. The first study is conducted using 152 subjects using four different application programs. The study objective is to validate the PU and PEOU measures, which resulted in two six items scales with reliability measures of 0.98 (for PU) and 0.94 (for PEOU). The results indicated that PU had a strong influence on intention, and intention predicted computer usage significantly. The results in both studies confirmed that behavioral intention was a major determinant of usage behavior. The TAM is shown in Figure 1, which is used as a research model to test the acceptability of e-government services. This study will utilize the three variables used in TAM; perceived usefulness (PU), perceived ease of use (PEOU) and intention to use as a surrogate of usage.

![Figure 1: The TAM model](image)

**Data Analysis and Discussion**

This study used two types of measures to explore the effectiveness and acceptability of e-government services. Section 4.1 describes experts' evaluation of e-government services, where section 4.2 tries to estimate users' acceptance of such service.

**Experts Evaluation**

Jong and Lentz [32] used an expert evaluation method to evaluate municipal websites. The basis for their argument is using users with better knowledge regarding subject matter, the medium, and the target audience. In this study, we used a group of masters' students specializing in computer sciences and computer information systems (25 experts). Such sample is considered suitable as students are users of such websites and went through many courses related to website analysis and are familiar with portals capabilities. Subjects were asked to explore and evaluate the e-government website in Jordan and compare that with different websites in the region. The unit of analysis in this section is the country website, and the sample centered on the Arab countries. Each subject checked two websites; Jordan's e-government portal and another Arab country in the region. In addition, each Arab country is checked by at least two subjects to check the results and confirm and remove inconsistencies. Table 1 lists the results of the stage where subjects were asked to evaluate the website regarding their stage of service.
Finally, experts were asked to check other characteristics of websites which are summarized in Table 2.

Table 1 indicates a lag in Jordan's position compared to other Arab countries, but still above the average. The top countries are consistent with the literature (UAE, Egypt & Bahrain); on the other hand, experts indicated a progress with respect to Qatar & Morocco.

**Table 1**: Arab Countries Experts Analysis

<table>
<thead>
<tr>
<th>#</th>
<th>Country</th>
<th>Informational</th>
<th>Two Way Communication</th>
<th>Value Exchange</th>
<th>Transformation</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Algeria</td>
<td>80%</td>
<td>80%</td>
<td>40%</td>
<td>0%</td>
<td>55%</td>
</tr>
<tr>
<td>2</td>
<td>Bahrain</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>40%</td>
<td>65%</td>
</tr>
<tr>
<td>3</td>
<td>Egypt</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>30%</td>
<td>61%</td>
</tr>
<tr>
<td>4</td>
<td>Lebanon</td>
<td>80%</td>
<td>80%</td>
<td>60%</td>
<td>30%</td>
<td>60%</td>
</tr>
<tr>
<td>5</td>
<td>Libya</td>
<td>80%</td>
<td>50%</td>
<td>20%</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>6</td>
<td>Morocco</td>
<td>80%</td>
<td>80%</td>
<td>60%</td>
<td>50%</td>
<td>68%</td>
</tr>
<tr>
<td>7</td>
<td>Mauritania</td>
<td>80%</td>
<td>50%</td>
<td>10%</td>
<td>0%</td>
<td>35%</td>
</tr>
<tr>
<td>8</td>
<td>Oman</td>
<td>30%</td>
<td>30%</td>
<td>10%</td>
<td>0%</td>
<td>24%</td>
</tr>
<tr>
<td>9</td>
<td>Qatar</td>
<td>60%</td>
<td>80%</td>
<td>20%</td>
<td>0%</td>
<td>76%</td>
</tr>
<tr>
<td>10</td>
<td>Saudi Arabia</td>
<td>30%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>21%</td>
</tr>
<tr>
<td>11</td>
<td>Syria</td>
<td>60%</td>
<td>50%</td>
<td>20%</td>
<td>0%</td>
<td>28%</td>
</tr>
<tr>
<td>12</td>
<td>Tunisia</td>
<td>50%</td>
<td>70%</td>
<td>0%</td>
<td>10%</td>
<td>34%</td>
</tr>
<tr>
<td>13</td>
<td>United Arab Emirates</td>
<td>80%</td>
<td>80%</td>
<td>60%</td>
<td>50%</td>
<td>61%</td>
</tr>
<tr>
<td></td>
<td>Mean for Arab Countries</td>
<td>70%</td>
<td>76%</td>
<td>42%</td>
<td>17%</td>
<td>54%</td>
</tr>
</tbody>
</table>

When looking to the specific numbers of the Jordanian website, we find that the e-government portal exists, disseminate information, and low on value exchange. The last stage can be considered not in existence, and this might be a deliberate strategy as the last one should come when we master the first two at least. Jordan's portal comes above average in all dimensions and also in the overall measure. Figure 2 shows the comparisons between the means of the Arab countries when averaged across experts and stages.
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![Figure 2: Mean Progress in Stages across Arab Countries](image)

**Table 2:** Comments by experts regarding Jordan e-government website

<table>
<thead>
<tr>
<th>#</th>
<th>Comment</th>
<th>Expert Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speed of loading is acceptable or fast</td>
<td>19 experts confirmed high speed and 2 reported is was slow.</td>
</tr>
<tr>
<td>2</td>
<td>Support for more than one language is obvious</td>
<td>22 reported more than one language</td>
</tr>
<tr>
<td>3</td>
<td>Number of links detected</td>
<td>26 links on average (17 experts reported results)</td>
</tr>
<tr>
<td>4</td>
<td>Existence of search engine</td>
<td>17 experts reported its existence</td>
</tr>
<tr>
<td>5</td>
<td>Shows the number of visitors</td>
<td>None reported the number of visitors from the site</td>
</tr>
</tbody>
</table>

**Users' Perceptions of E-government**

Lee and Kim [33] used interviews with governmental officials to record perceptions regarding information systems and information technologies used by governments' authorities (E-government initiatives). In the technology acceptance research, an extended model of the TPB was decomposed to explore the effect of trust in the context of e-government. Warkentin, Gefen, Pavlou and Rose [34] extended the TPB by adding two constructs: trust in e-government and perceived risk. The authors decomposed attitudes into PU and PEOU, but kept perceived behavioral control as is and dropped subjective norm. The major conclusion was that the model is suitable for the US environment and can be applied to other countries as well.

In this study and to evaluate the user perception, we used bachelor students in two undergraduate IT classes where they visited a lab and browsed the Jordanian e-government website for 30 minutes and then filled a survey that included items measuring ITU, PU and PEOU. The items used were adapted from Venkatesh, Morris, Davis and Davis [35], where the reliability measures of the three constructs were all above 0.8 and the sample was 108 students in the two classes.
Table 3 lists a description of the means and standard deviations of the three constructs, which shows a high perception of the website. The means of the three variables were all above 5.7, where a Likert scale of 7 points as used. A multiple regression test is also conducted by forcing the three constructs into the model and yielded the results reported in Table 4. The results indicate a high correlation between the independent variable and ITU with a determination factor $R^2 = 0.620$, adjusted $R^2 = 0.612$ (the model was significant at the 0.001 level, $F_{2,105} = 85.561$). One of the important comments is the high correlation between PU and PEOU, which indicates a mediation effect.

### Table 3: Descriptive Statistics

<table>
<thead>
<tr>
<th>Construct</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention To Use (ITU)</td>
<td>108</td>
<td>1</td>
<td>7</td>
<td>5.70</td>
<td>1.62</td>
</tr>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>108</td>
<td>2</td>
<td>7</td>
<td>6.18</td>
<td>1.11</td>
</tr>
<tr>
<td>Perceived Ease Of Use (PEOU)</td>
<td>108</td>
<td>1.5</td>
<td>7</td>
<td>5.76</td>
<td>1.13</td>
</tr>
</tbody>
</table>

### Table 4: Coefficients' Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficient B</th>
<th>Std. Error</th>
<th>Standardized Coefficient Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant) -1.625</td>
<td>0.568</td>
<td>-0.858</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>0.744</td>
<td>0.128</td>
<td>0.512</td>
<td>5.799</td>
<td>0.000</td>
</tr>
<tr>
<td>PEOU</td>
<td>0.473</td>
<td>0.126</td>
<td>0.331</td>
<td>3.742</td>
<td>0.000</td>
</tr>
</tbody>
</table>

With regards to Table 4, both variables (PU and PEOU) were significantly correlated to ITU (the bivariate correlations are: PU $\rightarrow$ ITU = 0.754 and PEOU $\rightarrow$ ITU = 0.706). Moreover, when combined, both variables were significant in influencing ITU with significance level less than 0.001.

**Research Recommendations for the Jordanian E-government Strategy**

Published in June 2006, Jordan E-government strategy classified its services into the following venues:

1- Vertical services: services vertically provided by one organization.

2- Cross-organizational services: services that require the involvement of more than one government agency.

3- Shared services: provide technological functionality to the previous two.

4- Composite services: bundled services that flow within government agencies (GERP).

It is obvious that the strategy is built around the notion of future integration which might be the ultimate objective (or stage). The strategy is built on solid ground with respect to the dimensions that relate to the success of the project. The four basic dimensions are: institutional framework, legal framework, ICT infrastructure, and business level. The strategy also identified, for each dimension, the needs, current status
and direction. The following discussion elaborate on directions of research related to the dimensions listed and how this research work fits in this direction.

On the institutional level, research should be directed to two main aspects: users needs (CRM initiatives) and business reengineering (to be aligned with the new online process). The major focus of CRM is users’ perception of the website and this research showed a high evaluation of such aspect. The institutional dimension requires that committees and administrative units be formed to handle the reform and the integration of online services into business process, thus requiring some research into the area of administering government operations and the entities interrelations within agencies. The experts’ test demonstrated in this paper indicated that this track is lagging specially with respect to advanced stages of e-government project.

The legal dimension is explored by Al-Omari and Al-Omari [36] where they found that current laws are satisfactory regarding transaction on the web and handling cyberspace crime, but the legality of physical presence by citizens can be an obstacle in some cases (related to laws of digital signature). Research should be directed in this area to accommodate new legal issues that might face government agencies when transacting with each other (own body of government), and how to secure information related to citizens (the distinction between legal and ownership of government). Partnership with private sector also needs some modifications of certain laws.

The ICT infrastructure is a vital dimension as Jordan is one of the leading countries in the region in relation to ICT capabilities and human resources. On the other hand, two aspects need to be explored: the e-government architecture and security issues. As a government body, security of information and privacy issues might be of importance to gain citizens acceptance and support. The gap between what customers want and what experts found in this research, regarding both the services and the key factors existing within this portal, indicates a need to work on both capabilities and infrastructure of this project.

Finally, the business level is a challenge to government agencies as they are required to reform their operations and processes and integrate online services in them, and this might be of a conflict to existing operations and services. This delay in implementing advanced stages of e-government might be caused by this resistance to change. Such issue is supported by Frehat (2007) and Bhatnager (2004) claims. In this regard, research toward business strategies, best practices methodologies, and business process reengineering is recommended.

It is evidenced that the e-government strategy can be supported by strengths like strong infrastructure, private sector participation, and a concerned government. On the other hand, citizen's access to the Internet (cost wise), legal issues, and government agencies reforms can be a crucial obstacle towards an effective and functional e-government service.

**Conclusions**

This paper explored the literature related to issues in e-government and empirically tested its acceptance by Jordanian citizens. An expert evaluation method is applied to
explore the status of e-government service in Jordan and compared that with other Arab countries. Experts indicated a lag in Jordan’s position among Arab countries and a lag also in their plans towards a transformational stage. Jordan seemed to have a good rank among Arab countries but not in a satisfactory way depending on its long history and government support in relation to the ICT sector. Jordan needs a long and serious effort to reach advanced stages of e-government lifecycle. On the other hand, e-government is well accepted by citizens as they evaluated high its usefulness and ease of use and showed a high intention to use the website. Citizens emphasized the high usefulness relationship and if we considered the mediation effect of usefulness and ease of use, we might support more this argument.

The Jordanian strategy towards e-government indicated four major venues, where service towards citizens and businesses is the major issue. The strategy indicated few dimensions and when looking thoroughly into those we find a gap between what was implemented and what is wanted and accepted by users. Finally, recommendations regarding research areas in the area of e-government that can benefit the improvement and utilization of such project were stated in the previous section. Academia is required to join forces with government to better serve customers, improve service and increase efficiency and effectiveness of government agencies.

Although the sample size is an acceptable for the tests conducted in this research [37], but still this work used a convenient sample of students as subjects in this test, where citizens of e-government services might be more diverse than this category. Also, more research is needed in the area of users needs and an in-depth look to what is actually happening through the Jordanian portal is important. Finally, recommendations stated in the section related to e-government strategy needs to be taken into consideration when implementing different stages of e-government project.

برограмم الحكومة الإلكترونية الأردنية: دراسة مرتكزة على رأي المستخدم

عماد أبو شنب و قاسم الراديدة

ملخص

البحث العلمي في مجال الحكومة الإلكترونية أظهر وجود هجوة بين أهداف الحكومات وبين حاجات المواطنين. استخدم هذا البحث 25 خبراً في مجال تكنولوجيا المعلومات و108 مستخدماً لتحقق هذين هدفين رئيسين. الهدف الأول كان مراجعة تجربة الحكومة الإلكترونية الأردنية باستخدام خبراء في هذا المجال. كانت نتيجة هذه المرحلة ان الموقع الأردني يقتصر على نشر المعلومات ويعتبر أيضاً مختراً وللبحث (TAM) بالمقارنة مع الدول العربية. أما الهدف الثاني فقد استخدم نموذج قبول التكنولوجيا (TAM) لفحص قبول هذه الخدمة من خلال علاقة درجة الفائدة وسهولة الاستعمال مع نية المستخدم للاستعمال. تبين نتيجة هذه المرحلة التقييم العالي للموقع ووصا المستخدمين عن الخدمة المقدمة. أخيراً فقد تم الإطار
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References