

THE DEPLOYMENT OF E-GOVERNMENT IN THE HASHEMITE KINGDOM OF JORDAN: FACTORS IN E-GOVERNMENT ADOPTION

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ABSTRACT

The Hashemite Kingdom of Jordan is one of the countries in the Middle East region that has started to implement e-government as a new technology in order to build knowledge based society. Despite the growing importance of e-government in Jordan, there is a lack of attention in investigating the social factors that may influence the adoption of e-government by the citizens. This paper examines the social factors the might influence e-government adoption by citizens in Jordan. These factors are examined through a literature search and questionnaire and data collected from 400 Jordanian participants, the research explores four different social factors: trust in terms of the security and privacy and trust in government, attitudes and beliefs, education, and accessibility. The Diffusion of Innovation (DOI) Theory (Rogers, 1983) and the Technology Acceptance Model (TAM) (Davis, 1989) is used in this research as the applicable theoretical background in examining social factors influencing e-government adoption in Jordan. This article provides an approach to bridging the gap between the theoretical design of e-government and the actual deployment of e-government services in society through interaction with the Jordanian citizens as end users. In order to form a wide-ranging and prudent framework for e-government adoption in the Hashemite Kingdom of Jordan, a model for e-government adoption in Jordan is designed. The constructs of the model are integrated from TAM, DOI Theory and other social factors identified in previous research. The validity of the framework is examined using multiple regression analysis to illustrate the different factors and to formulate the essential constructs of the research model. The findings indicate that website design, beliefs, complexity, and perceived usefulness are significant factors that may influence the intention of Jordanian citizens to use e-government.

KEYWORDS

E-government adoption, social factors, citizens, Jordan, research model

1. INTRODUCTION

E-government is an important area of government communication and policy that has its origin in new and advancing information technologies. E-government, as a new international phenomenon, has caught the attention of many governments around the world (Grant and Chau, 2005). The Jordanian government has implemented e-government to develop the social life in Jordan with the aim of creating a knowledge based society. However, the adoption and implementation of a holistic government approach to e-government is still in the infancy stage for many countries including Jordan. Jaeger and Thompson (2003) suggest that while e-government is in the development and implementation phase, many implementation challenges are related to stakeholder issues. E-government needs to have effective participation by different stakeholders

who “share ownership of e-government” to be implemented successfully (e-Government Strategy, 2006). However, there is a lack of citizen centricity in the actual implementation of e-government in Jordan (MoICT, 2006). In addition, there has been no attempt to examine the social factors influencing e-government adoption by citizens in Jordan. Gunter (2006) demonstrated that e-government “does not just depend on computer power, but also on the willingness of people to adopt it as a normal form of interface in respect of public services” (p.365). This study contributes to e-government implementation by analysing the participation of Jordanian citizens as stakeholders and users of e-government.

The web is considered the essential medium to launch e-government services in Jordan. The e-Government Strategy (2006) proposes e-Services as “government services provisioned through a technology-based channel that ultimately enable citizens, business, government departments, and government employees to interact with government in a timely, accessible and efficient manner” (p.18). Some of the government e-services already launched include e-Services in the Department of Land’s and Survey which allow users to view survey information such as cadastral sketch, parcel index, and parcel plan. E-services launched in the Income Sales and Tax Department include making tax forms available, moreover, the taxpayers can view the results of the accepted taxpayers’ returns and import exemption certificates (MoICT, 2006).

Finally e-government is not only improving public services but also aims to create “a climate in which people will feel civically more engaged” (Gunter, 2006). Therefore, this research will attempt to bridge the gap between the theoretical design of the e-government and the actual employment of e-government services in the real social life through interaction with the citizens as end users. A model for e-government adoption is designed in this research in order to create a potential strategy to increase the citizens’ participation with e-government in Jordan.

2. BACKGROUND

This research focuses mainly on social factors, which can be viewed as non-technical factors since they are identified in this research based on the social perspectives through interacting with the citizens. These different social factors could be categorized as: trust, attitudes and beliefs toward e-government as new technology, education that is the citizen’s ability to use required technologies (internet and computer) and accessibility in terms of the website design. These factors will be examined below.

Trust is an important element of e-government (Warkentin et al., 2002). Warkentin et al. (2002) defines trust as a belief that others will behave in a predictable manner. The importance of trust in e-government adoption has been stated by many researchers (Carter and Bélanger, 2005; Welch et al., 2005). Trust has been categorized by researchers into two categories: trust in the internet and trust in government. Carter and Bélanger (2005) argue that trustworthiness is one of the main factors that influence citizens’ intention to use e-government service in addition to perceived ease of use and compatibility. The authors study trustworthiness by focusing on two main ideas: citizens’ trust in using e-government transactions that are related with their concerns for privacy and security of their information, and citizen’s trust in the government itself.

Hazlett and Hill (2003) indicate that attitudes and beliefs are important in e-government implementation. This research addresses the attitudes and beliefs that Jordanian citizens might have toward e-government Jordan as a significant factor may influence their adoption for e-government. Pons (2004) pointed out, based on his study of e-government issues in the Arabic world, that there is limited internet usage due to the desirability of conducting face-to-face business and other transactions. Moreover, Norton (2002) mentions that Arabic religious beliefs can act against the internet due to a number of moral issues appear on the websites. Vassilakis et al. (2005) mention that some citizens may have a negative attitude towards electronic services as they fear job losses related to the change from paper-based, labour intensive methods of work.

Education is examined in this research in terms of people’s ability to use the internet or computers. The significance of addressing the education factor can be seen in Welch and Hinnant’s (2003) views about how internet use leads to trust in government. Welch and Hinnant’s (2003) research result found that the more individuals use the internet, the more satisfied they are with the level of reliability of information on government web sites. Therefore, based on the relationship between internet use and transparency, citizens who are able to use the internet are more likely to be satisfied with transparency and, therefore, they trust governments more. Therefore, ensuring that people have the ability to use the internet is important, since its

usage leads to them being more satisfied with e-government websites and the government itself. Consequently, this research attends to issues of the internet or computer use in order to examine its influence on e-government adoption in Jordan.

The Web is a significant tool that has changed communication between people and the way they do business (Holderness, 1998). As Web use has increased, as Becker (2004) states, ensuring a well designed website has become a main concern of many governments. Kumar et al. (2007) demonstrate that e-government websites represent the main gateways for delivering e-government services to the public. Bertot and Jaeger (2006) mentioned that accessibility is one of the most important methods of building useful user-centred e-government services. This research considers accessibility one of the major predictor of e-government adoption in Jordan.

3. THEORETICAL PERSPECTIVES

This section introduces the used theoretical perspectives in this research. Diffusion of innovation theory (DOI) and the technology acceptance model (TAM) are presented in this research as the adequate theoretical background to study the main factors that may influence e-government adoption in Jordan. Innovation is an "idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1983). E-government is a substantial example about a technological innovation adopted by many governments in either developed countries or developing countries. Researchers in information technology related adoption studies have used this theory to discuss the information technology innovation based on innovation's characteristics. There are five characteristics of successful adoption: relative advantage, complexity, compatibility, triability and observability. Relative advantage, complexity and compatibility have been found to be consistently significant in technology adoption in prior studies Tornatzky and Klein (1982). This research proposes the Diffusion of Innovation Theory to identify the social factors affecting e-government adoption in Jordan. The three technological characteristics of relative advantage, complexity and compatibility are proposed as relevant in the adoption of e-government in Jordan. The following is the definition of the three mentioned characteristics of Diffusion of Innovation Theory. Relative advantage is defined as "the degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 1983). Compatibility is defined as "the degree to which an innovation is perceived as being consistent with the existing values, past experience, and needs of potential adopters" (Rogers, 1983). Complexity is defined as "the degree to which an innovation is perceived as difficult to understand and use" (Rogers, 1983).

The Technology Acceptance Model (TAM) is an adaptation of the Theory of Reasoned Action, which states that actual behavior is influenced by the person's intention to perform such behavior, and this intention is influenced by one's attitudes and subjective norms (Ajzen and Fishbein, 1972). TAM states that there are two determinants for the consumer's attitudes toward usage intention, these are: Perceived Usefulness and Perceived Ease Of Use. 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" (Davis, 1989). Moreover, Perceived Ease of Use (PEOU) is defined as "the degree to which a person believes that using particular system would be free of effort" (Davis, 1989). Davis (1989) mentioned that system acceptance will suffer if users do not find a system useful and easy to use. Therefore, the technology that is relatively easy to use and helpful will have a positive influence on the person's attitudes and intention toward using that technology (Davis, 1989). The main two constructs of TAM, perceived ease of use and perceived usefulness are proposed to have influence on e-government adoption in Jordan.

4. RESEARCH HYPOTHESIS AND MODEL

This section presents the research model and hypotheses. Ten hypotheses are proposed, one for each independent variable in the model. The independent variables are proposed to have a direct relationship with the dependent variable which is e-government adoption. The main constructs of the research model (Figure1) are derived from the identified social factors and the theoretical perspectives presented above. The social factors are represented by citizens' trust, attitudes and beliefs, education, and accessibility. Relative

advantage, compatibility, and complexity are the main elements of the DOI. Perceived ease of use and perceived usefulness are the main determinants in the TAM.

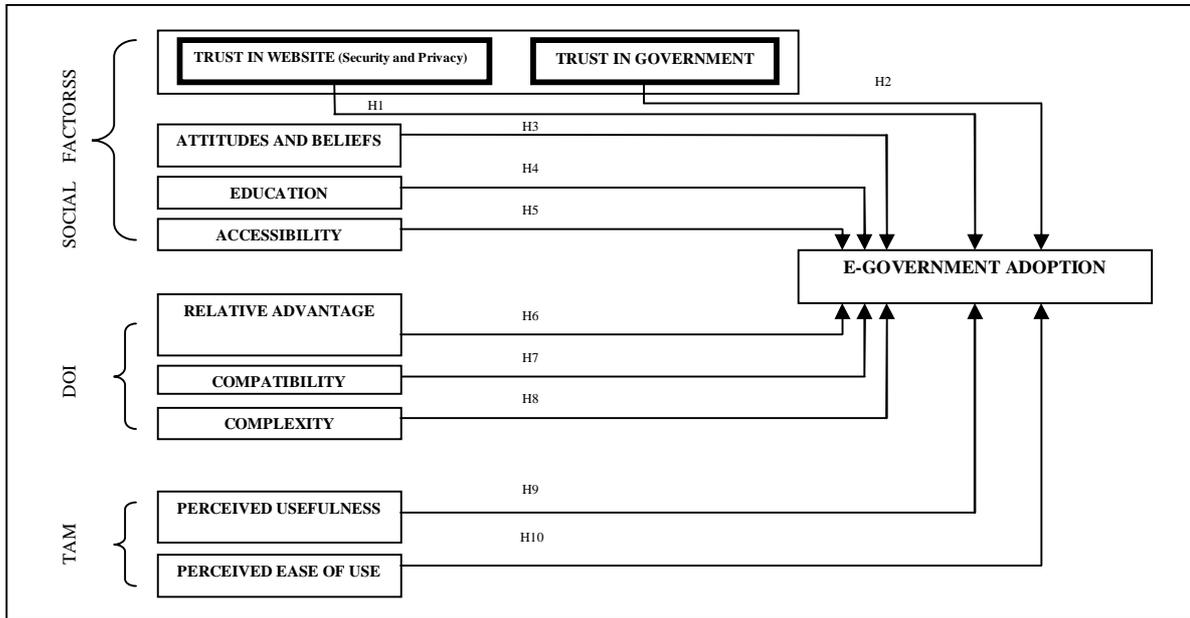


Figure 1. Research Model

The table below (Table 1) tabularizes the main hypotheses in this research. Ten hypothesis are designed, one for each independent variable.

Table 1. Research Hypothesis

	Hypothesis	Constructs
H1	Higher levels of trust in e-government website will statistically predict higher levels of user adoption of e-government websites.	Trust in Website
H2	Higher Levels of trust in government will statistically predict higher levels of user adoption of e-government websites.	Trust in government
H3	Higher Level of having a positive attitudes and beliefs in e-government website will statistically predict higher levels of user adoption of e-government websites.	Attitudes and beliefs
H4	Higher levels of ability to use internet and computer will statistically predict higher levels of user adoption of e-government websites.	Education
H5	Higher Levels of accessibility to e-government websites will statistically predict higher levels of user adoption of e-government websites.	Accessibility
H6	Higher levels of relative advantage will statistically predict higher levels of user adoption of e-government websites.	Relative advantage
H7	Higher levels of compatibility will statistically predict higher levels of user adoption of e-government websites.	Compatibility
H8	Lower levels of complexity will statistically predict higher levels of user adoption of e-government websites.	Complexity
H9	Higher levels of perceived usefulness will statistically predict higher levels of user adoption of e-government websites.	Perceived usefulness
H10	Higher levels of perceived ease of use will statistically predict higher levels of user adoption of e-government websites.	Perceived ease of use

5. METHODOLOGY

This research used surveys to collect information on citizen's attitudes to e-government adoption. The questionnaire was administered to 400 Jordanian citizens who have a regular access to the internet. There were 38.2% male and 61.6% female respondents. Of the sample, 49.4% were in the range of 20-29 years old, 31.4% were less than 20 years old, 13.5% were in the range of 30-39 years, 4.2% were in the range of 40-49 years of age, and 1% were over 50 years old. University students represent the majority of respondents. 70.6% were students in the universities while 15.5 % were employees in government service, 9.7% were employed in the private sector, and 3.5% chose the "other" option. Amongst respondents, 40.9% use the internet at the university, 34.2 % use it at the home, and 14.2 % use it at internet café. Work recorded the lowest percentage which is 10.2%. Of the respondents, 23.7% use the internet for email and chatting purposes, 4.5% use it for shopping, 24.4% use it for home work or checking results, 19 % using it for readings news and 27.7% use it for other purposes. In terms of amount of internet access time each week, 28.9% of respondents use it for less than one hour per week, 26.7% use it 4-8 hours of time, 20.4% use the internet more than 8 hours, and 23.2% 1-3 hours per week. Of the respondents, 60.1% hold the bachelor level of education, 21.9 % hold diploma level, 10.0% the number of respondents who hold the higher education level of education, while the rest number of the respondents either hold the secondary school level of education or chose the "other" option.

This study used a survey to examine the different social factors in the most practical way possible. Most of the survey items were adapted from previous studies (Davis, 1989; Moore and Benbasat, 1991; Gefen and Straub, 2000; Jarvenpaa et al. 2000; Pavlou, 2003; Van Slyke et al., 2004; Carter and Bélanger, 2005; Vassilakia et al., 2006). For more information on the construction of the survey and identification of relevant factors, see Alomari, Sandhu, and Woods (2009). The 5 point Likert Scale (interval scale) was used to measure responses to the statements in the research questionnaire with 1 (strongly agree) to 5 (strongly disagree). Because English is not the first language of Jordan, and most people are not fluent in English, the questionnaire was translated into Arabic. Back translation was used, the questionnaire translated from English to Arabic first and then from Arabic to English.

6. DATA ANALYSIS

To first analyse the results of the survey, exploratory factor analysis was conducted. The 65 items of the Likert scale were subjected to axial components analysis using SPSS version 16.0. Prior to performing axial component analysis the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .869, and the Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. Axial components analysis was conducted with Varimax rotation. The axial factor analysis revealed the presence of 14 components with eigenvalues exceeding 1. An inspection of the screenplot revealed a clear break after the sixth component. It was decided to retain six components as these components showing a number of strong loadings. These components were accessibility, perceived usefulness (PU), complexity, trust in website, trust in government, and beliefs. Moreover, a strong loading of items was recorded for the dependent variable, e-government adoption. Four factors were decided to be dropped from any further analyses and these were education, perceived ease of use, relative advantage, and attitudes. Then, the reliability analysis was evaluated for the main components using Cronbach's alpha. Cronbach's alpha for the main components of the factor analysis which are trust in website, trust in government, beliefs, and accessibility, perceived usefulness, complexity, adoption were respectively 0.778, 0.751, 0.733, 0.898, 0.870, 0.812, and 0.811.

Multiple regression analysis was used for hypothesis testing. Table 2 illustrates the main factors which were used for multiple regression. There were no violations of assumptions of multivariate normal distribution, independence of errors and equality of variance. Multicollinearity was not a concern with variance inflation factors ranging from for the main effect regression model. Outlier influential observations were identified with leverage, standardized residuals and Cook's D-statistic. This analysis indicated that there were no problems with respect to influential outliers.

Table 2. Final Regression Variables

Variable	No. of items	Mean	Standard deviation
Accessibility	8	1.5200	.55699
Perceived Usefulness	7	1.9077	.64765
Complexity	5	2.1912	.72616
Trust Website	4	2.8223	.86016
Trust Government	4	2.3083	.75425
Beliefs	3	3.3417	1.02533
Adoption	5	2.1925	.76219

The model explains 35% (adjusted R) of the variance in citizens' adoption of e-government. Because the overall model is significant ($F=36.762$, $P=0.000$), the significance of each variable were tested. Beliefs, website design, complexity, and perceived usefulness were significant. Table 3 demonstrates which hypotheses were supported.

Table 3. Hypothesis Testing

Hypotheses	Variable	Coefficient	<i>t-value</i>	Significance	Support
H5	Accessibility	.259	5.898	.000	YES
H9	Perceived Usefulness	.126	2.464	.014	YES
H8	Complexity	.284	5.593	.000	YES
H3	Beliefs	-.096	-2.274	.023	YES
H1	Trust Website	.063	1.392	.165	NO
H2	Trust Government	.086	1.794	.074	NO

Education, relative advantage, compatibility and perceived ease of use were dropped from further analysis because they did not load with their proper items. The modified model of the e-government adoption in Jordan is presented in Figure 2.

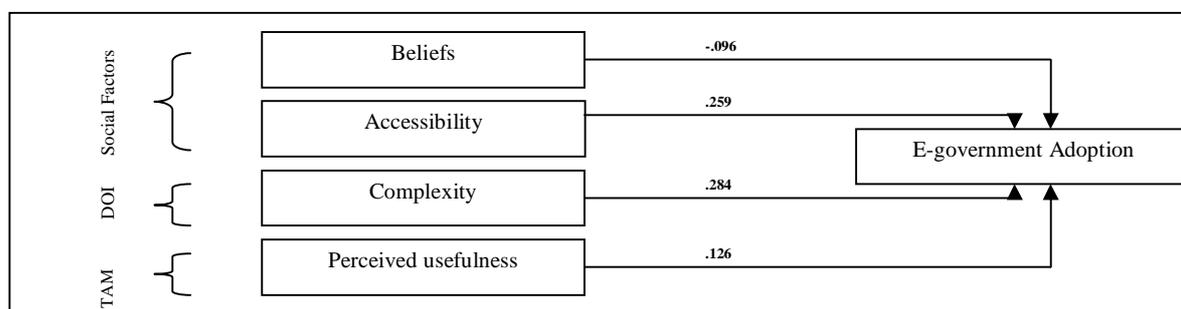


Figure 2. Research Modified Model (Results)

The following section discusses the significant results which are beliefs, accessibility, complexity, and perceived usefulness.

7. DISCUSSION OF THE SIGNIFICANT RESULTS

This section provides a discussion for the significant results of multiple regression these are beliefs (H3), website design (H5), complexity (H8), and perceived usefulness (H9). Hypothesis three (H3) is supported. Citizens' intention to adopt e-government increases if the citizens have high level of positive beliefs toward e-government. Some researchers mention that the people in the Arabic countries have some attitudes and beliefs that can act against internet usage and therefore the e-government (Norton, 2002; Pons, 2004). The significance of this factor in this research might refer that e-government as new technology has, over recent years been developed and implemented by the Western countries first. Therefore, e-government initiatives are implemented to suit the Western social life which is different to social life in the developing countries

especially Eastern countries. Chen et al. (2006) states that there are clear differences between developed and developing countries in history and culture. Many of the developing countries including Jordan have started to develop and implement e-government based to the different experiences of the developed countries. This means that the Jordanian government needs to test to what extent Jordanian beliefs similar or different to those beliefs of the people in the developing countries. Understanding the different beliefs assist Jordanian government to build the required strategies to deal with this issue and design the adequate strategy to introduce the e-government as new technological innovation to the Jordanian citizens.

Hypothesis five (H5) is supported. Citizens' intention to adopt e-government increases if e-government websites are available with adequate, attractive and well content organized design. Website is the main medium has been used by governments including the Jordanian government to launch government services and information. Therefore, government agencies in Jordan should ensure that their websites are accessible by the different users. Having the website design as a significant factor in this study might refer to one of the main challenges of the current implementation of e-government in Jordan which is lack of citizens' centricity. Therefore, this research will help Jordanian government to take the required steps in order to ensure citizens centricity in launching it services and information, consequently more users' satisfaction and intention to adopt. Bertot and Jaeger (2006) mention that accessibility is one of the most important methods of building a useful user-centred e-government services. This factor also would help the government entities to have a standardized design for their websites as citizens move from one website to another to conduct the different transaction.

Hypothesis eight (H8) is supported. Adoption of e-government by citizens in Jordan will increase if e-government services are launched with ease of understanding and use by Jordanian citizens in mind. Complexity is significant because the study was administered to people who are internet literate. As the sample has a high level of internet expertise, they are more able to recognize the importance of having understandable and easy online services through e-government websites. Complexity has often been bringing into being in a significant relationship with use intentions in other contexts, such as e-commerce (Van Slyke et al., 2004). However, this research found that complexity is a significant factor that may influence intention to adopt e-government, essentially by Jordanian citizens. Therefore, the government in Jordan should launch its services in an easy and understandable way by ensuring the simplicity of completing the different transactions within a small number of clicks and also by having the clear instructions to conduct the different transactions such driving licence renewal.

Hypothesis nine (H9) is also supported. Higher levels of perceived usefulness are associated with increased intentions to adopt e-government. This finding indicates that citizens will be more willing to adopt e-government if the services that are launched on the websites are more capable to increase the effectiveness and efficiency of conducting the different transactions. Administering the study on the people who are familiar with the internet usage is also clarifying the reason behind getting this factor significant. Internet literate people are more capable to assess to what extent the web-based services help them to conduct their transaction efficiently. For example, conducting transactions through the websites avoid people the delay which might create because of the queue when visit the government agencies physically. However, Carter and Belanger (2004) found that this factor is not in a significant relationship with the intention to use. That might refer to the used sample in their research as they conduct the study by surveying a people from different level of the computer and internet expertise however this research is conducted mainly on the people who are familiar and expertise in using the internet. To increase citizens' intent to use their government services online, agencies should provide information and services in a manner that is plateful the people. For example, the services should be provided with high speed processing to ensure there is no any delay could happen for the users, citizens.

8. CONCLUSION

Jordan has adopted and implemented e-government to develop the social life in Jordan by creating information knowledge based society. This study provides a contribution to have a successful e-government adoption project in Jordan by identifying the main factors that might influence e-government adoption by Jordanian citizens as stakeholders of the e-government. The factors derived from the literature of the social factors, diffusion of innovation theory (DOI) and technology acceptance model (TAM), in order to define the

main social factors influencing e-government adoption in Jordan. Multiple regressions were conducted for the different factors resulted from the factor analysis. The results indicate that accessibility, beliefs, perceived usefulness, and complexity are significant influences to adopt e-government by Jordanian citizens in Jordan. Identifying and understanding the factors will enable the government in Jordan to implement the e-government services that meet the needs of the Jordanian citizens. This research designed a model for e-government adoption in Jordan. The designed model may be applicable, with further studies, to study e-government adoption in the other Arabic countries due to cultural similarities (Jaeger and Thompson, 2003).

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