Measuring Social Factors in E-government Adoption in the Hashemite Kingdom of Jordan

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Abstract

This paper explores the measurement of social factors in e-government adoption in a developing country (Jordan). The Hashemite Kingdom of Jordan is developing strong Information Communication Technology (ICT) with the aim of becoming a knowledge based country and a regional Information Technology (IT) centre. Although e-government is an important part of this strategy, there appears to be a lack of understanding of the social factors that may influence citizens' intention to use e-government. This paper makes a contribution in examining these factors 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, internet and computer skill confidence, and website design. The measurements used in examining these factors were mostly adapted from previous research. We developed new measurements for the factors of internet related beliefs, internet and computer skill confidence, and website design. This research uses exploratory factor analysis to identify the main factors that may influence e-government adoption in Jordan.

1. Introduction

The internet as "an eraser of difference" that provides the universal access to information leading to social and economic development at national and international levels [1]. The internet is also a medium used by e-government to deliver its services and information through government Web pages. It has, changed, therefore the relationship between government and the other sections of society (citizens, the public sector, the private sector and businesses) from a traditional face-to-face or paper-based means of communication, to interactive communication through Web pages. E-government is defined in this paper as the "use of the internet to bring together a country's citizens, businesses and government" [2]. Amongst observable enhancements in telecommunication technologies, the internet is an innovation technology, and the potential of online financial transactions is one of the reasons for implementing e-government [2].

The benefits of e-government, such as efficiency in delivering government services and information [3] and ensuring more citizens participate in making political decisions [4], are the main reasons behind adopting e-government by developed and developing countries. Developed countries, characterized by features such as a long history of democracy, good infrastructure and specific government structure [4], have adopted e-government as a new innovation technology. However, developing countries as well as developed countries can benefit by adopting the new technology.

Governments, whether they are from a developed country or a developing country, need to identify the main factors affecting e-government adoption in order to specify strategies to successfully implement e-government. The Hashemite Kingdom of Jordan is one country that has initiated an e-government project to ensure the efficient delivery of services to the public and to reduce the cost of delivering such services. The Jordanian government, therefore, needs to identify influences that may affect e-government adoption in order to specify an appropriate strategy. E-government is not only improving public services but is also part of creating "a climate in which people will feel civically more engaged" [5]. Identification of the social factors and specifying the strategies to deal with them will be of benefit to the Jordanian government and other similar developing countries in facilitating efficient delivery of services and information to the public.

This paper explores the relevant social factors by first examining trust, attitudes and beliefs, internet and computer skill confidence and website design. Following exploration of these factors, we examine the relevant factors from the Diffusion of Innovation theory, including relative advantage, complexity and compatibility. We then examine the social factors from the Technology Acceptance Model which are Perceived Usefulness and Perceived Ease of Use. We then present the measures used in exploring e-government adoption from the perspective of 400 Jordanians with regular access to the internet. After presenting the factor analysis results, we discuss why

certain factors could be clearly identified in our data. We conclude by examining the study limitations and suggest areas for further research.

2. Background Literature and theoretical foundation

This section illustrates the theoretical background and previous research to introduce the factors from social perspectives.

2.1. E-government: Social Factors and E-government Adoption

A number of country factors are relevant to e-government adoption in Jordan. The Hashemite Kingdom of Jordan is a constitutional monarchy consisting of three main governmental branches: the executive, the legislature and the judiciary. The executive branch consists of the Jordanian government, through which His Majesty King Abdullah II exercises his executive authority. The Jordanian government (Prime Minister) is appointed by His Majesty King Abdullah II and the Prime Minister has the responsibility to choose the ministers. The Jordanian government consists of the Prime Minister and the Council of Ministers. One section of the government is the Ministry of Information and Communication Technology, which is responsible for implementing e-government. The second branch of the government is the Legislature and this consists of the House of Notables (Senate – royally appointed) and the House of Deputies, whose members are elected by Jordanian citizens. The third branch is the judicial branch

Jordan is a Middle Eastern country that is in an advanced stage of implementing e-government. Yet, the e-government implementation in Jordan faces challenges such as privacy and security concerns, lack of a legal structure for online activities, limited number of internet users, lack of citizen information technology skills, and inconsistency of standard design for the government entities websites. In Jordan, religion plays a significant role in determining the aspects, traditions, and norms of individuals' social life, including attitudes towards the internet. All these issues are reasons why this research investigates the related factors of trust in internet, trust in government, attitudes and beliefs, internet and computer skill-confidence, and website design.

The Jordanian national e-government project acknowledges the necessity of effective interaction between stakeholders and the e-government. Citizens (e-government users) are one of the main stakeholders of e-government in Jordan. Thus, this research contributes in exploring the issues in relation to Jordanian citizens to assist in increasing their participation in e-government. Thus, this paper seeks to clarify the main measurements used in examining the aforementioned factors.

The following sections identify the different social factors that might influence citizens' intention to adopt e-government.

2.1.1. Trust. Trust has long been considered as a prerequisite and consequence of e-government implementation [6]. Warkentin and colleagues [7] argue that "Trust is a central defining aspect of many economic and social interactions" (p.159). We define trust as a belief that others will behave in a predictable manner [7].

The electronic nature of interaction with e-government services leads to privacy and security concerns of citizens interacting with government electronic services [8]. These interactions require citizens to exchange personal information, such as credit card details, to access the services. The main concern of citizens, in many countries around the world, is the fear that their information could be misused [9] [8], breaching their privacy. Therefore, the interactions require citizens' trust, as citizens expect a predictable, private and secure transaction [10].

Trustworthiness can be perceived by the availability of three characteristics of a trustee which are ability, benevolence, and integrity [11]. Ability means to what extent a trustee can process "that group of skills, competencies and characteristics that enable a party to have influence within some specific domain" (p. 717). Benevolence means to what extent a trustee is believed "to want to do good to the trustor" (p.718). Integrity means to what extent a trustee adheres "to a set of principles that the trustor finds acceptable" (p.719). Based on these three characteristics, trustees should adapt their way of performing tasks to the predictable beliefs that citizens, who represent trustors, might have. In this paper, the trustee is the government and trustors are the citizens. Therefore, based on the above definitions and considering citizen concerns, we define trust in e-government as the belief that governments will adopt and implement an e-government with full functionality of privacy and security.

In the USA, Carter and Bélanger [12] examined the influence of trust on e-government adoption. They proposed a model of e-government trust that identifies the elements of trust in e-government. The model comprises disposition to trust, trust of the Internet (TOI), trust of the government (TOG) and perceived risk. Using a paper-based survey, they

collected data from 243 participants at a community concert and with undergraduate students. From 243 surveys administered, 214 were complete and used in the actual analysis. The participants had different levels of computer and internet expertise. The researchers adapted the survey items from previous research. In order to increase the generalizability of the results related to e-government adoption, Carter and Bélanger evaluated e-government adoption of the services of two widely known departments in the state of Virginia in the USA, which are the Department of Motor Vehicle (DMV) and the Department of Taxation (TAX). The results indicate that disposition to trust positively affects trust of internet (TOI) and trust in government (TOG), which in turn affect intentions to use an e-government service. This research examines both trust in the internet and trust in government in Jordan as potential factors relevant to e-government adoption.

2.1.2. Attitudes and Beliefs. Citizens with negative attitudes toward using government e-services represent one of the main barriers for e-government adoption. Some citizens may have a negative attitude towards electronic services and they would prefer to stay with traditional methods, which for most is the paper-based way [13].

Attitude has been emerged as an essential construct in models and theories of technology adoption. Attitude emerged as an essential construct in the Technology acceptance model (TAM), designed by Davis [14] in order to predict the use of information systems (IS). Furthermore, attitude is one of the essential constructs of social psychology theories that predict behavior relevant to information systems use such as the theory of reasoned action (TRA) (Ajzen and Fishbein [15]; and Fishbein and Ajzen [16]) and its extension, theory of planned behavior (TPB) (Ajzen [17]). In these theories and model, behavioral intention is identified as a function of different factors including attitude. Moreover, TRA and TPB identified attitude as a function of different factors such as behavioral beliefs and evaluation of outcomes. In the Technology acceptance model, attitude is identified as a function of the perceived ease of use and perceived usefulness beliefs. With this in mind, we consider attitude as a factor for e-government adoption function.

In the newly developed economy of Taiwan, researchers examined the acceptance of e-government services by citizens (Pin and Wu [18]; and Hung et al. [19]). Hung et al. [19] identified the factors relevant to public acceptance of e-government services. Based on the combination of three intention-based theoretical models (Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Decomposed Theory of Planned Behavior), the researchers developed their model for user acceptance of e-government services. Attitudes are one of the essential constructs of their model. The researchers used online tax filling and payment system (OTFPS) to verify the main constructs of the model to then identify the main determinants of user acceptance of e-government services in Taiwan. The results showed that e-government services acceptance can be explained in terms of the attitudes, subjective norms and perceived behavioral controls.

In the United States, Evans and Yen [20] conducted a conceptual study entitled with “E-government: An analysis for implementation: Framework for understanding cultural and social impacts”. The purpose of their study is to explore the emerging applications of e-government in the USA and the international community. Their study presents the domestic and international impacts. The international impacts included cultural and social adaptation issues. Religious beliefs were considered one of the significant international impacts. Evans and Yen declared that religious beliefs may slow e-government progress. Then, the authors point out that “some countries and/or religions shun outside influences and will not want their countries and homes “contaminated” by outside influences” (p. 368). Evans and Yen affirmed that these countries will likely defy encouragement from outsiders to change their ways. Considering these findings, we will address attitudes and social belief issues of citizens, such as religious views, relevant to e-government adoption by Jordanians.

2.1.3. Internet and computer skill confidence. The lack of education of citizens, especially in information and computing technology, is proposed as the most important factor affecting e-Government adoption in Jordan. Pons [2] found that the most important reason for lack of IT adoption in Arabic countries is the high level of illiteracy [2]. There are three key elements of education that should be considered for successful adoption of any technology. The elements are [2]: awareness of the internet; understanding of the internet; and workers with information technology skills. This section addresses the importance of internet understanding and the requirements of having the necessary skills to use information technology such as the internet and computers.

Education has been described as one of the problems related to e-government adoption, suggesting that as citizens’ education rises, and their knowledge in using the internet increases [21]. The most frequent use of e-government information and

services comes from populations who are experienced in using the internet as a technology [22]. There was a suggestion indicating that if citizens cannot access e-government services through the World Wide Web, then the government should not stop other channels, such as Call Centers or Fax, offering e-government services [23].

In one of the developed countries, Carter and Weerakkody [24] conducted a study in the UK. The purpose of the study is to compare the e-government adoption in the UK to the adoption in the US. The proposed a model in their study which consists of five different constructs, four independent variables and one dependent variable. The independent variables were relative advantage, trust, internet accessibility, internet skills while the dependent variable was intention to use. The researchers used the internet skills in order to examine the importance of having the required skills to use the internet on e-government adoption. The findings showed that internet skill is not a significant predictor of e-government adoption in the UK. Also, the results showed that the internet skills and accessibility may show a discrepancy depending on culture of both the UK and the US. Therefore, the internet skill is a significant predictor for e-government adoption in US. Therefore, this research examines internet and computer skill confidence as one of the predictor of e-government adoption by citizens in Jordan.

2.1.4. Accessibility. The Web is a significant tool that has changed communication between people and the way they do business [1]. As online communication increases, face to face communication decreases. As Web use has increased, governments have focused on improving website design to ensure public accessibility [3]. E-government websites should be designed to ensure that they are accessible to the public. Accessibility is defined as "the degree to which web information is accessible to all human beings and automatic tools" [25]. A study conducted on website design revealed that accessibility is one of the elements required to design efficient and effective websites, beside other elements such as navigation, aesthetic and content [26]. Accessibility influences the citizen's experience with websites and their satisfaction and adoption of new technology [26]. Accessibility, besides functionality and usability, is one of the most important methods of building useful user-centered e-government services [27]**.** So, this research addresses accessibility in terms of website design in Jordan as one of the component that affects e-government adoption. In the context of online services, Moon [28] conducted a conceptual study which provides an exploratory model to understand the factors that influence consumers' decision to adopt the internet instead of the traditional channels for information search or product purchase. The authors reviewed previous established theories on consumer decision. The authors proposed a conceptual model. They classified the factors in the conceptual model into three groups which are the person, problem, and context. Website characteristics were part of the context group. Website characteristics were addressed in different terms which were: information quantity, design, access and transition speed, user- friendliness of search structure, and update pace. The author assumed 5 propositions for the construct of the website characteristics such as *"The more user-friendly the search structure of the website is than the search procedure through the offline channel, the higher is the possibility of consumers' information search through the internet"(p.110),* and*" The better is the design of the website than the artistic facet of an offline channel's store display, the higher is the possibility of consumers' information search through the internet" (p.110).*

Considering these factors, this research investigates the role that website design may play in influencing citizens intention to use e-government in Jordan.

2.2. Diffusion of Innovation Theory

Innovation is an "idea, practice, or object that is perceived as new by an individual or other unit of adoption" [29]. E-government is a technological innovation adopted by many governments in either developed countries or developing countries.

Researchers in information technology-related adoption studies use this theory to discuss information technology diffusion based on the innovation's characteristics. There are five characteristics: relative advantage, complexity, compatibility, triability and observability. A meta-analysis of research on innovation adoption-implementation found that relative advantage, complexity and compatibility are consistently significant in influencing innovation adoption [30].

This paper uses the Diffusion of Innovation Theory to identify the social factors affecting e-government adoption in Jordan. These factors are identified through examining the applicability of three technological characteristics (relative advantage, complexity and compatibility) in the adoption of e-government in Jordan. The following is the definition of the three 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" [29]. 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" [29].Complexity is defined as "the degree to which an innovation is perceived as difficult to understand and use" [29]. This research proposes that relative advantage, compatibility, and complexity are concerns of Jordanians regarding the adoption of e-government.

2.3. Technology Acceptance Model

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 the surrounding subjective norms [31]. TAM states that there are two determinants for the consumer's attitudes toward usage intention and 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" [14]. 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" [14]. System acceptance will suffer if users do not find a system useful and easy to use [14]. 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 [14]. This research proposes that the main two constructs of TAM, perceived ease of use and perceived usefulness are concerns of Jordanians regarding adoption of e-government.

3. Methodology

This study surveyed people in Jordan to sustain their perceptions of e-government in Jordan. The results were analyzed using exploratory factor analysis.

3.1. Sample

The questionnaire was administered to 400 Jordanian citizens who have regular access to the internet. There were 38.2% male and 61.6% female respondents. Thus, the majority of the respondents were female. The analysis reveals that 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. These percentages show that the range 20-29 years of age is the largest group of the sample. The majority of respondents were University students. 70.6% were a student in the universities while 15.5 % were employees in the public sector, with 9.7% were employee in the private sector. University is the most frequently used place by respondents to use the internet. 40.9% of respondents 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. In addition, 4.5% use it for shopping, 24.4% use it for homework or checking results, 19 % using it for readings news. Option "others" was chosen by 27.7% of respondents. The range of less than one hour is the range of time which spent by 28.9% of respondents, 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. 60.1% of respondents 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 of the respondents either hold the secondary school level of education or chose the "other" option.

3.2. Instrument Development, Validity and Results

This study utilised a survey comprising 65 items to examine the different social factors in the most practical way possible. Most of the survey items were adapted from previous studies. The studies include the independent variables (IVs) of: trust of the internet and government (4 items - Carter and Belenger [32]; 3 items - Vassilakia et al. [13]); attitudes and beliefs (3 items - Jarvenpaa et al. [33]; 1 item -Vassilakia et al. [13]), perceived ease of use and usefulness (7 items - Davis [14]; 8 items - Carter and Bélanger [32]); relative advantage and compatibility (7 items - Moore and Benbasat [34]), complexity (7 items - Slyke et al. [35]), and intentions (3 items - Geffen and Straub [36]; 2 items - Pavlou [37]).

The research team reworded the subscales to make them applicable to Jordanian participants. The researcher's self -developed items based on previous literature include attitudes and beliefs (3 items), internet and computer skill confidence (5 items), and website design (10 items). A panel of experienced e-government researchers reviewed and approved the final questionnaire. A five point Likert Scale (interval scale - from strongly agree to strongly disagree) was used to measure different items in the research questionnaire. This study measures the different factors, based on the internet (web) as the main medium for running e-government. 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. Back translation described as "the best known and most popular method in educational testing and psychological measurement" [38].

Before conducting the actual survey, a step-by-step process was used to develop the survey instruments. The process began by creating a conceptual definition for each construct. These definitions were created based on the comprehensive review of literature identified for each constructs. Then, the researchers designed the items which fit with each construct. A total of 70 items were identified for the ten constructs related to the e-government adoption in Jordan.

We pilot tested the survey with a group of Jordanians. The twenty five participants were identified on the basis of their education and ability to use the information technologies. The participants were approached in regard to complete the questionnaire and give their feedback and comments on the different items used. The majority of respondents indicated the overlap between to a number of items for the different constructs. These constructs were jointly perceived as usefulness and relative advantage, and perceived ease of use and complexity. The respondents gave their comments about the items that need to be excluded to ensure there is no repetition on the items used. After excluding these items, the number of items then became 66 items. Some of the respondents suggested that the items for a particulate construct should be in both directions. The respondents also provided a number of suggestions regarding rewording of the items especially with the Arabic version. Also, they suggest some changes regarding the spelling typographical errors. Then, the modified version of the questionnaire was sent out again to the pilot group to be completed, asking them to estimate the time required to complete the questionnaire. The respondents reported back on the ease of understanding of the questionnaire and the time required to complete the questionnaire which is 15-20 minutes. The final version of the questionnaire was designed based upon the feedback. Then the questionnaire was reviewed by a panel of researchers who approved the final version of questionnaire used in the actual administration of the survey.

The final questionnaire comprises two sections with 65 questions in total. The construct of trust in the internet addressed issues related with the security and privacy of the internet. These measurements were: "The internet has enough safeguards to make me feel comfortable using it to interact with the government online"; "In general, the internet is now a robust and safe environment in which to transact with the government"; "I am confident that the data I submit through the government websites will not be misused and will be treated confidentially"; and "I am confident that no fraud will be committed". The measurements were adopted from previous studies (Carter and Bélanger [32]; Vassilakia et al.[13]). We adopted questions on the construct of trust in government from previous studies (Carter and Bélanger [32]; Vassilakia et al. [13]). The questions include: "The government can be trusted to carry out online transactions faithfully"; "I trust the government because they keep my best interests in mind"; "I am confident that the forms I submit though the government websites will be processed"; and "I am confident that the government will provide me with reliable and up to date information through its websites". We used these four items to examine trust in government. We adopted measurements for attitudes and beliefs from previous studies (Jarvenpaa et al. [33]; Vassilakia et al. [13]). These were: "The idea of using e-government website to interact with government is appealing"; "Using the e-government website is a good idea"; and "I like the idea of using the e-government Website"; and "I would easily adapt to any changes that e-government may cause". We designed the other measurements of attitudes and beliefs within three main clusters based on our reviews of the literature. These measurements consider perceptions about religious views towards the internet including that the internet is a source of immorality issues, the influence of the internet on work status such as losing a job or shifting in power positions, and unfavorable experience of using e-services. The items were: "I would prefer paper-based work because of negative impressions I have about electronic transactions"; "I would prefer not to use the internet because of immorality issues which are displayed on the internet and which are against the rules of my religion"; "I would have negative attitudes toward internet because paper-based work will be eliminated and could affect my work status". These seven questions were grouped together to jointly examine attitudes and beliefs as one construct.

We designed the main questions for internet and computer skill confidence based on the importance of the internet and computer skills required to interact with the government through websites rather than assessing the different services provided through e-government websites. Also, our questions point to the importance of participants' internet and computer literacy in relation to awareness of internet benefits. The measurements were : "I would find it easy to navigate within public websites without having internet or computer skills"; "It is not easy for

me to understand and be aware of internet benefits without having the required skills to use it"; "I have the internet and computer skills which enable me to navigate within websites to use different e-government services"; "Having the internet and computer skills improves my interaction with the government online through using different e-government websites"; "Having the internet and computer skills enables me to assess the services provided through e-government websites". We designed the five measurements based on the definitions and studies that we outlined in the internet and computer skill confidence section of this paper.

We designed the measurements for website design based on the criteria to evaluate government websites outlined in the website design section of our literature review. We grouped these criteria into different categories such as content, accuracy services, privacy, links, feedback mechanism, accessibility, design, and navigability. The criteria reflect the customer-centric approach in delivering services and information through websites. We focus on the customer centric approach by asking questions related to the citizens as the end users of e-government websites. These measurements are: "E-government websites should be available with well organised content"; "E-government websites should present attractive screens (colours and backgrounds)"; " E-government websites should be able to be opened with different internet browsers"; "E-government websites should provide clear directions for navigating the site"; "E-government websites should present information in a simple and understandable manner"; "E-government websites should have consistent screen layouts"; "E-government websites should provide up to date information"; "E-government websites should be available with update links (the links should not lead to deleted pages or re-directs)"; "E-government websites should be available with accurate information"; "E-government websites should ensure the protection of the users' privacy rights"; and "E-government websites should match the different needs of users. Altogether, we designed eleven items to examine website design.

The measurements of perceived usefulness were designed based on established measurements (David [14] and Carter and Belanger, [32]). These measurements are in three clusters which are "job effectiveness", "productivity and time saving" and "importance of systems to one's job" (David [14]). In this research, the measurements explore the significance of using e-government websites to accomplish tasks quickly, to save time, to do the job more easily, to complete different transactions faster, to enhance effectiveness in searching for and using different services. The measurements include: "E-government websites enable me to accomplish tasks more quickly"; "Using e-government websites saves me time"; "Using e-government websites make it easier to do my job"; "E-government websites would enable me to complete different transactions more quickly"; "I think e-government websites would provide a valuable service for me"; "The content of e-government websites would have no use to me"; "The e-government websites would enhance my effectiveness in searching for and using different services currently available online"; and "I would find e-government websites useful". Thus, we propose eight items for perceived usefulness, the first construct of the technology acceptance model.

We constructed the measurements of the perceived ease of use based on established measurements (David [14] and Carter and Belanger, [32]). These measurements mostly fall into three main clusters which are "physical effort", "mental effort", and "how easy the systems to learn" (David [14]). The measurements were "I often become confused when I use the e-government websites"; "Interacting with e-government websites requires a lot of my mental effort"; "Learning to interact with the e-government websites would be easy for me"; "I believe interacting with the e-government websites would be a clear and understandable process"; "I would find the e-government websites to be flexible to interact with"; "It would be easy for me to become skillful at using the e-government websites"; and "Using the web would enhance my efficiency in interacting with the E-government". Thus, measuring perceived ease of use, the second construct of TAM, utilizes seven items.

The questions we used to measure relative advantage include: "Using the web would enhance my efficiency in interacting with the e-government", "Using the web would not make it easier to explore and gather information from e-government websites"; "Using e-government website would give me greater control over my interaction with government"; and "The disadvantages of my using the e-government Website far outweigh the advantages". We measured compatibility with: "I think using the web would fit well with the way that I like to gather information from e-government"; "Using the web to interact with government would fit into my lifestyle"; and "Using e-government website fits into my work style". The four items of relative advantage and the four items of compatibility were adopted from previous research conducted by Moore and Benbasat [34].

The measurements of complexity were designed mainly. We examined the complexity of finding

information and conducting financial transactions on the internet with seven questions. These were: "Learning to use the e-government website for exploring information is easy for me. (e.g. finding information about the required conditions to complete a transaction"; "Learning to use the e-government website to do different transactions is easy for me (e.g. financial and or personal information transactions)"; "I believe that it is easy to get the e-government website to do what I want it to do"; "Interacting with e-government website to explore information is clear and understandable. (e.g. finding information about the required conditions to complete a transaction)"; "Interacting with e-government website to do different transaction is clear and understandable (e.g. financial and or personal information transactions)"; "Overall, I believe that using the e-government website to explore information is easy"; and "Overall, I believe that using the e-government website to do different transactions is easy". We adopted these questions from previous research conducted by Slyke et al. [35].

For the dependent variable of e-government adoption, we asked five questions. These were: "I would not hesitate to provide personal information to the e-government websites"; "I would use the web to retrieve information from the government"; "I would use the web to inquire about government services"; "It is likely that I will use the web for financial transactions with the government in the near future";and "Given the chance, I predict that I will use government websites". We adopted the measurements from previous research (Geffen and Straub [36] and Pavlou [37]).

We used exploratory factor analysis to identify specific factors relevant to e-government adoption in Jordan. The 65 items of the Likert scale were subjected to axial components analysis using SPSS version 16.0. Prior to performing axial component analysis, we assessed the suitability of data for factor analysis. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Oklin value was .869, and the Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix.

We conducted axial components analysis with Varimax rotation. The axial factor analysis revealed the presence of 14 components with eigenvalues exceeding one. An inspection of the screeplot revealed a clear break after the sixth component. We retained six components as these components showed a number of strong loadings with each other. These components were website design, perceived usefulness (PU), complexity, trust in website, trust in government, and beliefs. Moreover, a strong loading of items were recorded for the dependent variable (e-government adoption). Due to weak loadings, four factors were dropped from any further analyses. These were internet and computer skill confidence, perceived ease of use, relative advantage, and attitudes.

The main components were then evaluated for reliability using Cronbach's alpha. Table 1 presents the major components of the exploratory factor analysis and the reliability analysis.

4. Results

In this section, we discuss the main results of the exploratory factor analysis. Table 1 lists the main factors for further discussion.

Table 1. Reliability Analysis

Construct	No. of items	Alpha
Trust in internet	4	0.776
Trust in Government	4	0.752
Beliefs	3	0.729
Website design	8	0.898
Perceived usefulness	5	0.862
Complexity	4	0.758
Adoption	5	0.811

5. Discussion

The following paragraphs discuss the significant factors of e-government adoption in Jordan.

5.1. Trust in Internet and Government

This research shows that trust in government is an identifiable concern of internet users in Jordan. As previously outlined, lack of citizens' centricity is one of the main weaknesses of e-government in Jordan [39]. Trust in internet and trust in government were a major finding of the factor analysis conducted in a previous e-government adoption study [32]. In that study, trust in internet and trust in government, emerged as a significant component with multiple regression analysis indicating trust as a predictor of citizens' intention to use e-government [32]. The electronic nature of interaction with e-government services leads to privacy, security and trust issues for citizens interacting with government electronic services [8]. The main concern of citizens, in many

countries around the world, is the fear that their information could be misused [9] [8]. Previous research conducted by Carter and Bélanger [32] reports alpha for both factors trust in internet and trust in government which were respectively 0.9202 and 0.8734. Yet, the alpha values (Table 1), for the factors recorded here are 0.778 and 0.751 respectively. Although, this research adopts most of the measurements of the two factors from the study conducted Carter and Bélanger, this research reports lower alpha values. Carter and Bélanger conducted the study in USA where is the information technology infrastructure is strong and where is the legal structures for the internet usage is more advanced compared to Jordan.

The government in Jordan should design the adequate legal structure for internet usage to convince people with the security and safety of providing their details via government websites. Also, the government entities in Jordan should show their willingness and ability to provide citizens with customer centric services by publicly promoting their strategies. Further analysis will utilize trust in website and trust in government to specify their influence on e-government adoption in Jordan.

5.2. Beliefs

Beliefs emerged as an identifiable component relevant to e-government adoption in Jordan. Beliefs in our research incorporated "I would prefer paper-based work because of negative impressions I have about electronic transactions"; "I would prefer not to use the internet because of immorality issues which are displayed on the internet and which are against the rules of my religion"; "I would have negative attitudes toward internet because paper-based work will be eliminated and could affect my work status". Beliefs in previous research in the West incorporated issues such as fear of job lose, thus excluding religion.

Previous e-government initiatives have been mainly implemented in away to suit the social life in the western countries where religion often plays a less obvious role in citizen's lives. Hill et al. [40] stated that "much of the technology designed and produced in industrialized countries is culturally-biased in favor of their social and cultural systems; consequently, developing countries encounter cultural and social obstacles when transferring technology into practice". Jordan is one of the countries where religion plays a significant role in determining the different aspects of social and traditional life. Hofheinz [41] mentioned that religion is one of the main features of internet usage in Arabic countries (including Jordan). People in the in the Arab world find the internet as an approach to break up the limitations of traditional and social life. Thus, a religious view toward the internet is one of the items included the factor of belief in this research. This paper shows reliability (*alpha=0.733*) of the measurements used, including religious views, in examining the beliefs.

5.3. Website Design

Website design emerged as an identifiable component relevant to e-government adoption in Jordan. The main items to examine e-government websites are based on the different evaluation studies which focused on the main contents that websites should contain to ensure more access by citizens. For example, the item *"E-government websites should provide clear directions for navigating the site"* indicate to one of the main website features which is navigability. This paper reports a high reliability value to the construct of website design which is *alpha=0.898*. A previous conceptual study [28] emphasises the importance of addressing the website design impact on the usage of online services.

The aforementioned alpha value demonstrates the necessity of designing a government website with adequate features as in Jordan; there is no standard design for the websites either for the ministries or the other entities of government. Websites has been considered by e-government project in Jordan as the main channel for launching government information and online services. However, the idea of interaction with the government in Jordan through web is still new idea for most people in Jordan who used to finalize their transactions by using paper-based work. Thus, as e-government websites are the main gates for the government to interact with the citizens, the government websites should be available with the applicable design features to ensure more satisfaction from the Jordanian citizens and therefore more intention to use e-government.

Website design will be used in further research to examine its influence on e-government adoption in Jordan. In Saudi Arabia and Oman, Abanumy et al. [25] mentioned that the websites in these two countries still need considerable efforts to become accessible websites at all.

5.5. Perceived Usefulness and Complexity

The survey respondents were internet literate and so they were more capable to assess to what extent the use of e-government websites are easy to understand and use, and to what extent it is useful in conducting the different transactions. Therefore, the questions assessing these two constructs loaded as

expected in the factor analysis. Further research will determine the influence of these two factors on e-government adoption in Jordan.

Previous research, conducted by Carter and Bélanger [32], used complexity and perceived usefulness as the main constructs to explore their influence, joining other factors, on e-government adoption. In that research, complexity was not included in the model of e-government adoption due to its similarity with the perceived ease of use [32]. Thus, the alpha value was not reported for complexity. Yet, the alpha value for complexity recorded here was 0.812. This research adapts the measurements of complexity from previous research [36] conducted in the context of web-based shopping (e-business) which also reveals the reliability of complexity with the *alpha=0.78*. Moreover, in Carter and Bélanger's [32] research, perceived usefulness was loaded with relative advantage and the researchers decided to drop it from further analysis. That research shows the reliability of the perceived usefulness with *alpha =0.8827*. This research presents the reliability of perceived usefulness with *alpha= 0.870*.The participants that were surveyed in that research had different levels of computer and internet expertise whereas the participants in this research were all internet literate. Therefore, we recommend that e-government adoption research using participants with similar levels of internet literacy should measure both complexity and perceived usefulness.

6. Limitations and Further Research

This paper addresses the social factors that may influence e-government adoption by surveying a sample of Jordanian citizens. The survey item scales were mostly adapted from valid and reliable surveys conducted in Western countries. Thus, those items were designed to suit the social and cultural life in those countries. This research is conducted in one of the Middle Eastern countries which is Jordan where is the social and traditional life plays a significant role in determining the different aspects of individual life. Thus, further qualitative research is needed to further examine the meaning and interpretation of the scales item used here and to examine if other factors are also relevant to e-government adoption in Jordan. Also, future research should identify the relationship between the social factors and the dependent variable, e-government adoption. Finally, this paper measures social factors by focusing on the website as the main channel to run e-government. Further research should measure the social factors that may influence the adoption of a specific online service of one of the departments in Jordan such as the income and sales tax department.

7. Conclusion

This study explores different factors related to e-government adoption in Jordan. We derived the factors from the Technology Acceptance Model, Diffusion of Innovation theory and previous research on social factors e-government adoption, in order to define the main social factors influencing e-government adoption in Jordan. This paper also identifies the main measurements used to examine these factors, most of which were adopted from previous established items. This research used exploratory factor analysis to identify relevant and reliable factors. The results indicate that, website design, beliefs, perceived usefulness, complexity, trust in e-government, trust in government, and e-government adoption are the main components requiring further analysis.

Knowledge of the factors that influence adoption will enable the Jordanian government to develop online services that meet the needs of its citizens. The position of e-government adoption in the Middle-East Region is still at a developmental stage despite the growing importance and emphasis that governments of this region, place on e-government. Currently, there is a lack of attention in investigating the factors that may influence citizens in adopting e-government. This research has identified relevant social issues in one of the countries in this region and the results can quite easily be adapted to the other culturally and socially similar Middle-Eastern countries to help them consider social factors in e-government adoption.

7. References

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