THE RELATIONSHIP BETWEEN PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, PERCEIVED INFORMATION QUALITY, AND INTENTION TO USE E-GOVERNMENT.

SOUD ALMAHAMID[1,*], ARTHUR C. MCADAMS[2], TAHER AL KALALDEH[3], MO'TAZ AL-SA'EED[4]

[1]Asst Prof., Department of Business Administration, AHU, Ma'an, Jordan.
[2]Asst Prof., Department of Management, BU, Bridgeport, USA.
[3]Asst Prof., Department of Management, Middle East University for graduate studies, Jordan.
[4]Asst Prof., Department of Accounting, Al Balqa' Applied University, Jordan.

Corresponding author is to be contacted at Al Hussein Bin Talal University, Faculty of Business Administration and Economics, Ma'an, B.O.X. 20 Tel: 00962777732235.

ABSTRACT

Purpose- The purpose of this study is to explore and investigate empirically the relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government to gather information and conduct transactions by Jordanian citizens. **Motivations-** The motivations for conducting this study are: this work has never been done in the Jordanian e-government context; there is a significant part of e-government literature that investigates various factors that determine intention to use e-government in developed countries, however, there is a dearth of studies that investigate intention to use e-government for gathering information and conducting transactions in developing countries; and finally, it is an empirical research where important findings emerge and as a result, relevant managerial implications are provided. **Design/methodology/approach**- A questionnaire survey was developed based on the related literature. The original version of the questionnaire was in English then translated into Arabic. The questionnaire was circulated to a selected sample of Jordanian citizens who are aware of e-government services. **Findings**- The results of data analysis have revealed that Jordanian citizens perceive that e-government system is useful, easy to use, and to some extent has a high level of information quality. The results have also showed that there is a significant positive relationship between perceived usefulness, perceived ease of use and perceived information quality and intention to use e-government for gathering information and conducting transactions. Finally, the results suggest that citizens' gender and level of education make some differences in terms of using e-government for gathering information rather than for conducting transactions. **Research limitations**- This research has not taken into consideration all the contextual factors that may determine intention to use e-government for gathering information or conducting transactions. Also, it did not take into account the possibility of any intervening, mediating, and moderating variables that may strengthen the hypothesized relationships in the research model. **Practical implications**- As this research focuses on perceived usefulness, perceived ease of use, perceived information quality and tries to link those with intention to use, as result; it will encourage the use of e-government for gathering information and conducting transactions. It also raises the policy and decision makers' awareness of how Jordanian citizens are going to use e-government services. Finally, it gives e-government project national team an idea of how to design e-government strategy according to citizens' needs.

Key Words: *Perceived Usefulness, Perceived Ease of Use, Perceived Information Quality, E-government Adoption, E-government Intention to Use,*

1. INTRODUCTION

Electronic government has been viewed as the adoption of information and communication technology (ICT) by government organizations to achieve better public services. E-government

implementation efforts around the globe began in the late 1990s. Governmental organizations aim to offer better, faster and transparent channels for citizens and business organizations to interact with the government. E-government system, as any technological system, can provide various benefits for users (e.g. increases efficiency, increases effectiveness, increases transparency, being cost effective, reduces administrative burden, reduce paper works, ensures instant response, available 24 hours a day/ 7 days a week, reduces data entry errors, improves service quality, increase citizens participation in decision-making process and public issues, creates opportunities for introducing new services, and perhaps change the way citizens consume e-government services). An e-government system has also been established to ensure high level of collaboration and information sharing between various governmental organizations. Implementation efforts in most regions and countries have now progressed from basic information offering to more integrated service offerings that include reengineering traditional processes and transforming conventional information systems to allow more citizen-centric e-government services. Because the public sector transformation process is more complex and has distributed decision-making, it requires clear understanding of the political context, business processes, web-technology, and methods that enable to overcome the traditional boundaries that exist between government organization units.

E-government developments have been increasingly examined and questioned (Reddick, 2004, 2005; Al-adawi et al. 2005; Gil-Garcia & Martinez-Moyano, 2007; Lau et al. 2007; Horst et al. 2007), It is still necessary to comprehend how e-government evolves in a real setting. There are several stage-models that explain e-government developments (Layne & Lee, 2001; Reddick, 2004; Al-adawi et al. 2005; Andersen & Henriksen, 2006; Gil-Garcia & Martinez-Moyano, 2007; Carter & Belanger, 2008). Each of the stage-models is discriminated by various attributes or characteristics. However, in reality there is overlapping of those characteristics between phases. Although the stage-models vary in number of stages, there is some agreement on two important stages: informational stage and transactional stage. In the informational stage, government supplies a significant amount of information on the website such as, available services, required forms, required fees, etc. In the transactional stage, citizens and business organisations can implement transactions electronically without any need to attend related government agencies. Although, the stage or evolutionary models have established a deep understanding in how e-government developed and evolved, most of these models were built on weak conceptual foundations and migrate from other disciplines (Heeks & Bailur, 2007). Therefore, new ideas of non-linear process of e-government development emerged. The fundamental assumption of the non-linear process states that it is not necessary to pass through all the stages. For instance, developing countries that implement e-government later than developed countries can avoid the previous mistakes of the latest and bypass some stages in shorter time.

However, creating an e-government website and making public services available online does not necessarily guarantee that citizens are going to use it, nor does it establish how they are going to use it. Are they going to use it to gather information or conduct transactions? Are citizens going to use it continuously? Is e-government use still limited on the informational stage in developing countries (the case of Jordan)? Once the e-government literature is reviewed, it is understood that an in-depth investigation of factors influence intention to use e-government system is needed. This paper aims to answer the first question through filling a void in the literature by developing a conceptual framework that consists of the following constructs: perceived usefulness, perceived ease of use, perceived information quality, and e-government intention to use. The first section of this paper provides an introduction. The second section outlines the motivations for this study. The third section presents the research objectives. The fourth section looks at the e-government related literature. The fifth section exhibits the research model and methodology. The sixth section describes data analysis. The final section supplies discussion, future research, managerial implications, and conclusions.

2. MOTIVATIONS FOR THIS STUDY

The motivations for this study emerge from the recommendations that appeared in the literature of e-government adoption and intention to use (Kumar et al. 2007, Wangpipatwong et al. 2008). Investigating citizens' responsiveness or reactions to e-government public services offerings is needed (Gil-Garcia & Martinez-Moyano, 2007; Verdegem & Verleye, 2009). Presumably, presenting up-to-date, effective and secure information on an e-government website will encourage more organisations, and individuals to gather

information, download forms, fill in, and return files, which lead to a significant cost saving and efficiency gains for all participating parties (Tung & Rieck, 2005). Hung et al., (2006) launch a strong call for more empirical research on users' acceptance of e-government services to improve its effectiveness and quality. More clearly, Kumar et al. (2007) argue that understanding why and how citizens use and interact with e-government websites is an important research investigation. Similarly, Mofleh & Wanous (2008) argue that there is misunderstanding between the actual citizens' needs and how the government understands these needs. Currently, the up-take and widespread use of e-government public services is still problematic in most countries (Verdegem & Verleye, 2009). Finally, Al-adawi et al. (2005) hypothesizes that empirical evidence that shows how perceived usefulness and perceived ease of use is linked with intention to gather information or conduct transactions is needed. Thus, it is certainly worthwhile to investigate this issue in more detail.

3. RESEARCH OBJECTIVES

The major objectives of this research are concerned with answering the following questions:

1. To what extent do Jordanian citizens perceive that the e-government system is useful, easy to use, and has high information quality?
2. What is the relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government for gathering information or conducting transactions?
3. Do the demographic variables (e.g. age, gender, level of education, years of experience in using computers, and years of experience in using internet) make a difference in the relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government for gathering information and conducting transactions?

4. LITRATURE OF E-GOVERNMENT INTENTION TO USE

Digital government or E-government changes the fundamental assumptions of public services delivery. E-government project implementations have both negative and positive consequences, in terms of users' expectations "benefits and impediments" (Gilbert & Balestrini, 2004; Gil-Garcia et al, 2007). It is important to bear in mind

that although new technological innovation provides benefits, it is not free of negative consequences. At the beginning of any e-government project implementation, the government makes an effort to make available as many public services online as possible, which represents the supply side approach of e-government. However, Riddick (2005) explored the citizens' interaction with the e-government from the demand side. According to his view, the E-government evolved through two phases: First, "information dissemination" in which the government catalogues information on a formal website for public use. Second, "transactions" in which citizens can execute transactions and, at the same time, receive services delivered electronically. Riddick concluded that in reality, the informational phase is more dominant than the transactional phase. As citizens cannot execute complete transactions, it is normal that the average usage of the e-government website falls below expectations even in more developed countries (Kumar et al., 2007).

The supply side approach does not take into account the needs of citizens and business. Therefore, a gap exists and will continue to exist between the supply side and the demand side. Thus, the e-government is far from reaching its maximum potential until the gap between what is offered and what is used is eliminated. Due to this gap, the government cannot justify large investments in e-government system and will not be able to get all of the possible value out of these investments (Al-adawi et al. 2005, p1). To reduce the gap between what is offered and what is used, user-centric and collaborative e-government practices are required (Verdegem & Verleye, 2009; Gil-Garcia et al, 2007). These practices focus on the demand side in an attempt to meet citizens and business' needs. As van Dijk et al (2008) state, there is a lack of investigation and empirical data into the demand side of e-government services (such as benchmarking and multiple comparisons similar to the supply side). Likewise, Gil-Garcia et al (2007) highlight the importance of continuous evaluation of the impact of e-government strategies on current and emerging citizens and business needs. Similarly, Shalini (2009), states that a high level of the supply side does not necessarily guarantee an intensive usage of e-government public services. As citizens vary in their preferences, backgrounds, education level, annual income, experience in using computers, and experience in using internet, their intention to use e-government services and actual use may vary from one group to another.

There are different theoretical models and frameworks used in the e-government literature to explain intention to use and actual use of e-government public services by citizens and organisations (Carter & Belanger, 2005, 2008; Ebbers & van Dijk 2007; Layne & Lee, 2001; Lau et al. 2007; Reddick, 2005, 2004; van Dijk et al. 2008). "Technology Acceptance Model" by Davis (1989) and "Diffusion of Innovation Theory" by Rogers (2003) draw up guidelines on how the adoption and diffusion of new innovation occur in the real world. Rogers perceives that technology appropriation passes through different successive stages: knowledge, persuasion, decision, implementation, and confirmation. The success of an innovation can be evaluated using five innovation characteristics: relative advantage, compatibility, complexity, trialability, and observability. Carter and Belanger (2005) constructed a high level research model from the Technology Acceptance Model, diffusion of innovation theory, and web trust models to form a model of factors that influence the intention to use e-government services. The results revealed that relative advantage, image, and compatibility are significant predictors of citizens' intention to use e-government services.

Following this further, Hung et al. (2006) explored Taiwanese acceptance and use of online tax filling and payment systems by using a survey instrument. The results indicated that the strongest determinants of e-government services acceptance were perceived usefulness, ease of use, perceived risk, trust, compatibility, external influences, interpersonal influence, self-efficacy, and facilitating conditions. In addition, Kumar et al. (2007) developed a model of e-government adoption and citizens' satisfaction establishing that user's characteristics (perceived risk, perceived control, and internet), website design (perceived usefulness and perceived ease of use) influence directly e-government adoption whereas service quality improves citizens' satisfaction. The model hypothesized that if citizens are satisfied with the quality of the e-government services, they will adopt and use them frequently. Furthermore, van Dijk et al. (2008) used the Technology Acceptance Model to explain the use of government internet services. The availability of internet services, the knowledge of this availability, the preference to use digital channels, and the ability and experience to do this were among the fundamental conditions for internet usage. They argued that the acceptance and use should be analyzed as a dynamic process. Unexpectedly, the results showed that social-demographic and psychological factors did not influence e-government acceptance and usage. Simultaneously, Wangpipatwong et al. (2008) suggested empirically that perceived usefulness, perceived ease of use and computer self-efficacy directly enhanced citizens' continuance intention to use e-government. In addition, they found that perceived ease of use indirectly enrich continuance intention through perceived usefulness.

"Theory of Reasoned Action" TRA (Ajzen & Fishbein, 1980) and "Theory of Planned Behaviour" –TPB (Ajzen, 1985) were also used to explain citizens intention to use e-government. For instance, Gupta et al. (2008) used "Unified Theory of Acceptance and Use" to investigate the factors that influence adoption of information communication technology (ICT) by employees in one governmental organisation in India. The results revealed that performance, effort expectancy, social influence and facilitating conditions are positively impacting the use of ICT. The study failed to find any significant moderating effect of gender on the aforementioned relationships. In contrast, Tung and Rieck (2005) developed a theoretical framework to examine factors influencing the adoption of e-government services among business organisations in Singapore. The theoretical framework proposed that perceived benefits, management readiness, sensitivity to cost, external pressure, and social influences were positively influencing adoption decision. The results revealed that there is a significant positive relationship between perceived benefits, external pressure, social influence, and the firms' decision of adoption.

Although it is true that the "Technology Acceptance Theory", "Theory of Planned Behaviour", and "Unified Theory of Acceptance and Use of Technology" represent the fundamental bricks of the e-government literature development and adoption, there is still a lack of theories and analytical approaches that explain why and under what circumstances individuals and organisations intend and / or continue to use e-government services. In fact, "the portrayal of an up-to-date, effective and secure online public administration may encourage more companies to make queries, download forms, files returns and even tender for government projects online. This leads to significant cost savings and efficiency gains for both participating parties" (Tung & Rieck, 2005. P.437). While the above arguments appear reasonable, logical, and true; they lack empirical proof. Overall, understanding and building on the related literature, our research took the advice of

Wangpipatwong et al. (2008) and has come under the umbrella of Hung et al. (2006) categorization (category / 5).

In the Jordanian context, the e-government program initiative was established by a royal decree in 2000. The Jordanian e-government initiative aims to transform Jordan into a knowledge based society by improving governmental performance, enhancing national competitiveness, increasing transparency and accountability, reducing cost, and improving technical and non-technical competencies. This initiative counters various challenges (Al-Omari, 2006; Abu-Samaha & Abdel Samad, 2007) such as: low level of internet penetration, infrastructure constraints, digital divide, limited information technology (IT) skills, limited public sector reform efforts, lack of an enabling legal framework, and lack of awareness, education, preparedness, public sector reform, organisational and technical change management. The unreadiness of citizens, business organisations, and government institutions still represents a big barrier for e-government success (Al-Omari, 2006; Al-Omari & Al-Omari, 2006). Before launching the e-government initiative, the readiness of the following aspects should be assessed: Society, government institutional frameworks, human resources, existing budgetary resources, inter-department relationship, national infrastructure, economic health, education, information policies, private sector development and other related issues. Although there were various studies that look at technical issues (Architecture, Readiness, and Challenges) of e-government in Jordan (Al-Omari, 2006; Al-Omari & Al-Omari 2006; Abu-Samaha & Abdel Samad, 2007), only the study of (Mufleh & Wanous, 2008) tried to understand what factors influence the adoption of e-government services in Jordan. The study proposed that trust in internet, trust in government, compatibility, awareness, and previous experience affect intention to use e-government. The results suggested that trust in government, trust in internet, and compatibility are significant predictors of citizens' intention to adopt e-government services. However, there is still a dearth of empirical studies that investigate intention to use, continuance intention to use, and citizens' satisfaction with e-government services.

Table 1: Literature related to intention to use e-government

Factors determine e-government intention to use	Supported literature
Perceived benefits, management readiness, sensitivity to cost, external pressure, and social influence.	Tung and Rieck (2005).
Perceived usefulness, ease of use, perceived risk, trust, compatibility, external influences, impersonal influence, self-efficacy, and facilitating conditions.	Hung et al. (2006).
Social–demographic factors, psychological factors, availability of internet services, knowledge of availability of internet services, preference to digital channels, ability and experience to use digital channels.	Van Dijk et al (2008).
Perceived usefulness, personal experiences, risk perception, and trust.	Horst et al. (2007).
User's characteristics (perceived risk, perceived control, internet), website design (perceived usefulness and perceived ease of use), service quality, and satisfaction.	Kumar et al. (2007).
Relative advantage, image, compatibility, and ease of use.	Cater and Belanger (2005).
Perceived usefulness, perceived ease of use, trust, and perceived risk.	Al-adawi et al. (2005).
Disposition to trust, trust of internet, trust of the government, and perceived risk.	Belanger and Carter (2008).
Perceived usefulness, perceived ease of use, computer self-efficacy.	Wangpipatwong et al. (2008).

6. RESEARCH MODEL AND METHODOLOGY (INSTRUMENT DESIGN AND MEASURMENTS)

The research model that guides this study is depicted in Figure 1; the model examines the

relationship between perceived usefulness (PU), perceived ease of use (PEOFU), perceived information quality (PIQ), and intention to use e-government for gathering information (ITG) and conducting transactions (ITC). The model is constructed based on similar research models that appeared in the literature of e-government adoption. The related literature of e-government intention to use has been reviewed precisely to ensure that the significant factors that frequently appeared in the literature were not missed. Table (2) summarizes e-government intention to use related literature that highlights the importance of the chosen factors that influence intention to use e-government for gathering information and conducting transactions.

Figure 1: The Research Model
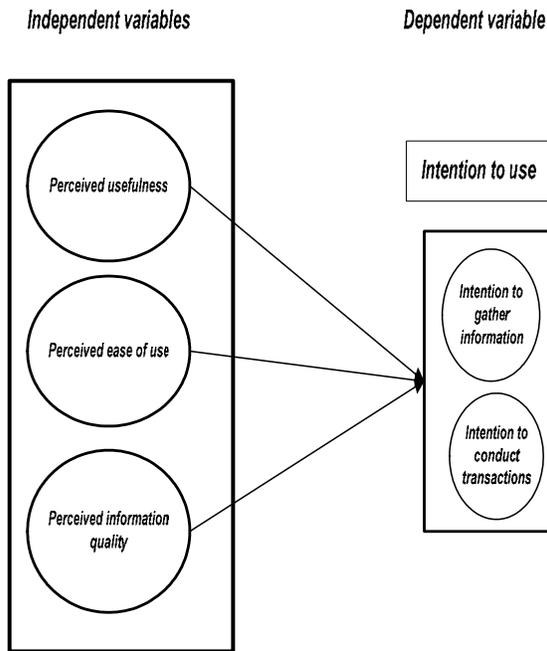
This research is concerned with investigating to what extent Jordanian citizens perceive that e-government system is useful, easy to use, and has a high level of information quality. It also intends to explore the relationship between perceived usefulness, perceived ease of use, perceived information quality and intention to use e-government to gather information and conduct transactions. In addition, the differences between Jordanian citizens in intention to use e-government for gathering information and conducting transactions in terms of gender, age, level of education, computer experience, and internet experience were main concerns of this study. Thus, the cross-sectional approach seems to be the most appropriate method for investigating this

phenomenon. The philosophy of the cross-sectional approach is to study a particular phenomenon at a particular time. Therefore, a large sample to carry out advanced data analysis is needed in order to ensure that the research results are generalizable. A questionnaire survey was utilized to collect relevant data from the target population. The population of this research consists of all Jordanian citizens who are aware of e-government services.

Table 2: Proposed factors affecting intention to use and operational definitions.

Variable	Description	Reference
Perceived usefulness	Citizens' perception of e-government services usefulness.	Hung et al.2006.
Perceived ease of use	Citizens' perceptions of e-government ease of use.	Hung et al. 2006; Carter & Belanger 2005.
Perceived information quality	Citizens' perceptions of e-government website information quality.	Parasuraman et al. 1988; Lee et al. 2002; Kumar et al. 2007; Prybutok et al. 2008.
intention to use e-government	Reflects the desire to use e-government services now and in the future.	Wangpipatwong et al.2008.

The survey items were adapted from related literature. The items for measuring perceived usefulness and perceived ease of use were adapted from Hung et al. (2006); Tung and Rieck (2005); Wangpipatwong et al. (2008). The items for measuring perceived information quality were adapted from Parasuraman et al. 1988; Lee et al. 2002;Prybutok et al. 2008.The information quality includes the following dimensions: Accessibility, Relevancy, Timeliness, Understandability, Appropriate Amount, Objectivity, Security, Completeness, Free of Error, Concise Presentation. The items for measuring intention to use e-government for gathering information and conducting transactions were adapted from Al-adawi et al. (2005). To measure perceived usefulness, perceived ease of use, perceived information quality (Accessibility, Relevancy, Timeliness, Understandability, Appropriate

Amount, Objectivity, Security, Completeness, Free of Error and Concise Presentation), and intention to use e-government for gathering information and conducting transactions, 5 items, 8 items, 37 items (4, 3,4,3,2,4,3, 5,3, 4), 11 items (6 for gathering information and 5 for conducting transactions) were used respectively. Each item was rated on a scale of 1 to 5 (Ranged from Strongly Disagree to Strongly Agree).

The questionnaire was originally designed in English and then translated into Arabic. Afterwards, the Arabic version was checked by experts in e-government domain to ensure there was no loss of meaning during the translation process. High level of validity was ensured through extensive revision by experts and consultation of prior tested instruments. Based on the feedback the researchers received from the reviewers, any questions that caused confusion or where deemed potentially difficult to understand were dropped or replaced by new understandable items. It was decided to circulate the questionnaire to citizens who are already familiar with e-government services. The questionnaire was accompanied by a covering letter explaining the research objectives. The participants were asked to complete the questionnaire at a convenient time for them. The main reason for using a selected sample is that not all Jordanian citizens are informed of the availability of e-government services. Also, the internet service is still costly for ordinary people, and therefore, is not widely distributed. The main survey consisted of 600 questionnaires. Out of the 600 questionnaires, 200 were received. However, 25 questionnaires were discarded because they had unacceptable amount of missing data. Therefore, 175 were usable questionnaires and entered for data analysis. The usable responses represented 29% response rate. This response rate is acceptable for this type of study. Descriptive statistics and advanced techniques were used to test the research hypothesis.

Table 3: Research Hypothesis

Null Hypothesis		Construct
Hypothesis 1	**H0**: Jordanian citizens do not perceive that e-government system is useful, ease of use, and has high level of information quality.	Extent to perceive
Hypothesis 2	**H0**: Jordanian Citizens do not intend to use e-government system to gather information or conduct transactions.	Intention to use
Hypothesis 3	**H0**: There is no relationship between perceived usefulness and intention to use e-government system to gather information and conduct transactions.	Perceived Usefulness
Hypothesis 4	**H0**: There is no relationship between perceived ease of use and intention to use e-government system to gather information and conduct transactions.	Perceived ease of use
Hypothesis 5	**H0**: There is no relationship between perceived information quality and intention to use e-government system to gather information and conduct transactions.	Perceived Information quality
Hypothesis 6	**H0**: There is no difference between Jordanian citizens in using e-government to gather information and conduct transactions in terms of gender, age, level of education, computer experience, and internet experience.	Demographic variables

7.2 DATA ANALYSIS

7.2.1 Descriptive Statistics

The first section of the questionnaire intends to collect some information about the respondents' background. The research sample consists of 118 males (Two thirds 67.4%) and 57 females (nearly One third 32.6) (see Table 4), from different regions across Jordan. Almost half of the respondents (44%) are in the age range from 18 to 29, which suggests a considerable amount of experience in using computers and internet. The respondents distribution regarding the education level is as follows: 13.1% had secondary school; 18.9% achieved a college certificate, 54.3 obtained

a university degree, 11.4% followed higher education (Master degree) and only 2.4 hold a PhD, which indicates that this sample represents highly educated Jordanian citizens. Nearly half of the participants (47.5%) have more than 6 years of experience with computers, which suggests that they can use e-government services without difficulties. A significant number of respondents (59.4) have 4 or more years of using internet, which indicates that our respondents are probably familiar with e-government public services.

Table 4: Respondents background
(number of respondent = 175)

		Frequency	Percent
Gender	Male	118	67.4
	Female	57	32.6
Age	18 – 23	17	9.7
	24 – 29	60	34.3
	30 – 35	58	33.1
	35<	40	22.9
Level of education	Secondary school	23	13.1
	College	33	18.9
	Bachelor	95	54.3
	Master	20	11.4
	P.h.D	4	2.3
Computer experience	> 1 year	21	12.0
	1 – 3 years	37	21.1
	4 – 6 years	34	19.4
	6 years <	83	47.5
Internet experience	> 1 year	35	20.0
	1 – 3 years	36	20.6
	4 – 6 years	40	22.8
	6 years <	64	36.6

A reliability test was carried out using Cronbach's alpha, which measures the internal consistency of research constructs. The recommended minimum acceptable limit of reliability "alpha" for exploratory study is 0.60 (Hair et al., 1998). The results of α – values for all the research constructs [Perceived usefulness, perceived ease of use, perceived information quality, intention to use (intention to gather information and intention to conduct transactions)] are above the recommended one (See table 5). Thus, it can be concluded that the scale has internal consistency and reliability. In other words, the items that are used in it measures what is intended to measure.

Table 5: Cronbach's Alpha of research constructs

Research constructs	Number of items	Cronbach's Alpha
Perceived usefulness	5	**.93**
Perceived ease of use	8	**.70**
Perceived Information quality	*Number of items*	*Cronbach's Alpha*
Accessibility	4	**.81**
Timeliness	3	**.89**
Relevancy	4	**.88**
Understandability	3	**.83**
Quantity	2	**.64**
Validity	2	**.64**
Objectivity	4	**.84**
Security	3	**.74**
Completeness	5	**.88**
Free of error	3	**.85**
Concise presentation	4	**.79**
Intention to gather information	*6*	*.84*
Intention to conduct transactions	5	**.80**

To test the first hypotheses (H1), the descriptive statistics seem to be the most appropriate method for analysis. As it is stated, Jordanian citizens do not perceive that e-government system is useful, ease of use, and has a high level of information

quality. It is important to test the real perceptions of citizens, and the only way to know that is through their levels of agreement with the items that measure the perceived usefulness, perceived ease of use, and perceived information quality. The average response for each of the perceived usefulness items is above the midpoint (3) of Likert scale (see Table 6). This means that the respondents show a high level of agreement and their answers range between agree and strongly agree. In other words, Jordanian citizens perceive e-government system as useful and easy to use; most of the average responses are above the midpoint of the scale apart from PEOU1, PEOU3, and PEOU6. Although these three items are slightly less than 3, the general perception of Jordanian citizens toward ease of use is positive.

Table 6: descriptive statistics of perceived usefulness and ease of use

Perceived usefulness	Mean	Std. Deviation
PU1	3.6457	1.21304
PU2	3.6914	1.20186
PU3	3.6954	1.12475
PU4	3.7241	1.13473
PU5	3.7314	1.20434
Perceived ease of use	Mean	Std.Deviation
PEOU1	2.7657	1.15817
PEOU2	3.4229	1.13641
PEOU3	2.8400	1.20707
PEOU4	3.1543	1.12657
PEOU5	3.3600	1.07831
PEOU6	2.9600	1.09524
PEOU7	3.3543	1.04506
PEOU8	3.3179	1.01590

In relation to perceived information quality (See table 7), only five items (T1, T3, Q1, C2, and C5) have an average less than 3. Although the averages of these items deviate slightly from 3, it is still close to the scale midpoint. Clearly, the answers of the respondents where around neutral more than disagree or strongly disagree. As T1 and T3 relate to information timeliness, it seems the information that appears in the e-government website is not updated frequently. Q1 concerns with availability of information in the e-government website, it shows that there is an insufficient volume of information and mismatch between what is offered and users' needs. C2 and C5 relate to completeness

of information in the e-government website, the average responses of these items indicate that the available information in the e-government website is incomplete and does not have sufficient breadth and depth for users' tasks.

Table 7: Descriptive statistics of perceived information quality dimensions *(Respondents# 175)*

Accessibility	Mean	Std. Deviation
A1	3.34	.98767
A2	3.44	.96262
A3	3.37	.94339
A4	3.44	.97415
Timeliness	Mean	Std. Deviation
T1	2.82	1.17813
T2	3.04	1.11603
T3	2.88	1.18535
Relevancy	Mean	Std. Deviation
R1	3.42	1.11638
R2	3.52	1.01619
R3	3.45	1.05435
R4	3.41	1.02427
Understandability	Mean	Std . Deviation
U1	3.40	.99480
U2	3.48	.97580
U3	3.56	1.00893
Quantity	Mean	Std. Deviation
Q1	2.90	1.08105
Q2	3.16	.93167
Validity	Mean	Std. Deviation
V1	3.41	1.05195
V2	3.36	1.06760
Objectivity	Mean	Std. Deviation
O1	3.30	1.02648
O2	3.53	.92272
O3	3.49	.92522
O4	3.42	.96328
Security	Mean	Std. Deviation
S1	3.36	1.08964
S2	3.35	.87979
S3	3.33	1.01929
Completeness	Mean	Std. Deviation

C1	3.0977	1.09476
C2	2.9713	.99958
C3	3.0116	1.08364
C4	3.2114	1.06452
C5	2.9885	1.01428
Free of error	*Mean*	*Std. Deviation*
F1	3.2971	1.03543
F2	3.3543	.96500
F3	3.4457	1.00925
Concise presentation	*Mean*	*Std. Deviation*
CP1	3.1437	1.00118
CP2	3.2914	.92269
CP3	3.1552	.95206
CP4	3.2816	.95325

conduct transactions	*Number of respondents*	*Mean*	*Std.Deviation*
ITCT1	175	3.0229	1.256
ITCT2	174	2.8161	1.263
ITCT3	175	3.0457	1.212
ITCT4	175	2.8857	1.312
ITCT5	175	2.8971	1.377

7.2.2 Correlation, Independent Sample T-Test, and One Way -Anova

The correlation analysis was used to explore the strength of the relationship between independent variables (perceived usefulness, perceived ease of use, and perceived information quality) and intention to use. It allows testing the strength of the relationship between several independent variables and one dependent variable, which is the case of this study. Therefore, it looks like the correlation analysis is the most suitable method to test the research hypothesizes (H3, H4, and H5). Spearman correlation (rs) and Kendall's tau-b are used to test the relationship between the research constructs (See Tables 9 and 10). The values of both coefficients range from −1 (negative association, or perfect inversion) to +1 (positive association, or perfect agreement). A value of zero indicates the absence of association. Kendall tau-b coefficients are positive and significant $P<.05$ (r =.127 P-value = .019; r =.258 P-value= .000; r = .457 P-value = .000) for perceived usefulness, perceived ease of use, and perceived information quality respectively. Furthermore, Spearman's coefficients are positive and significant with $P<.05$ for all the research constructs r = .159 P –value=.036; r = .335 P-value= .000; r =.596 P-value=.000. Because the P-value is <.05 , we reject the null hypothesis that assumes no relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government system to gather information. As a result, Jordanian citizens who perceive that e-government is useful, easy to use, and has a high level of information quality, will use it for gathering information.

To Test H2, the average response for each item that measures intention to gather information and conduct transactions was computed (See Table 8). If the average is above midpoint (3) of Likert scale, it means that there is a high level of agreement among the respondents regarding the use of the e-government system for gathering information and conducting transactions. Therefore, the answers range between agree and strongly agree. Interestingly, almost all the items that measure intention to gather information are above the Likert scale midpoint (3) apart from ITG1 and ITG4. As expected, most of the items that measure intention to conduct transactions with e-government were less than 3 apart from ITCT1 and ITCT3.

Table 8: descriptive statistics of intention to gather information and conduct transactions

Intention to use e-government to gather information	*Number of respondents*	*Means*	*Std. Deviation*
ITG1	175	2.9371	1.277
ITG2	175	3.3371	1.122
ITG3	175	3.4457	1.095
ITG4	175	2.9486	1.272
ITG5	175	3.0971	1.333
ITG6	175	3.2629	1.196
Intention to			

Table 9: The correlation between independent variables and intention to gather information.

			PU	PEOU	PIQ	ITG
Kendall's tau_b	PU	Correlation Coefficient	1.000	.184**	.290**	.127*
		Sig. (2-tailed)	.	.001	.000	.019
		N	174	172	171	174
	PEOU	Correlation Coefficient	.184**	1.000	.380**	.258**
		Sig. (2-tailed)	.001	.	.000	.000
		N	172	173	170	173
	PIQ	Correlation Coefficient	.290**	.380**	1.000	.457**
		Sig. (2-tailed)	.000	.000	.	.000
		N	171	170	172	172
	ITG	Correlation Coefficient	.127*	.258**	.457**	1.000
		Sig. (2-tailed)	.019	.000	.000	.
		N	174	173	172	175
Spearman's rho	PU	Correlation Coefficient	1.000	.239**	.385**	.159*
		Sig. (2-tailed)	.	.002	.000	.036
		N	174	172	171	174
	PEOU	Correlation Coefficient	.239**	1.000	.509**	.355**
		Sig. (2-tailed)	.002	.	.000	.000
		N	172	173	170	173
	PIQ	Correlation Coefficient	.385**	.509**	1.000	.596**
		Sig. (2-tailed)	.000	.000	.	.000
		N	171	170	172	172
	ITG	Correlation Coefficient	.159*	.355**	.596**	1.000
		Sig. (2-tailed)	.036	.000	.000	.
		N	174	173	172	175

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: The correlation between independent variables

			PU	PEOU	PIQ	ITC
Kendall's tau_b	PU	Correlation Coefficient	1.000	.184**	.290**	.119*
		Sig. (2-tailed)	.	.001	.000	.029
		N	174	172	171	173
	PEOU	Correlation Coefficient	.184**	1.000	.380**	.144**
		Sig. (2-tailed)	.001	.	.000	.008
		N	172	173	170	172
	PIQ	Correlation Coefficient	.290**	.380**	1.000	.316**
		Sig. (2-tailed)	.000	.000	.	.000
		N	171	170	172	171
	ITC	Correlation Coefficient	.119*	.144**	.316**	1.000
		Sig. (2-tailed)	.029	.008	.000	.
		N	173	172	171	174
Spearman's rho	PU	Correlation Coefficient	1.000	.239**	.385**	.149
		Sig. (2-tailed)	.	.002	.000	.050
		N	174	172	171	173
	PEOU	Correlation Coefficient	.239**	1.000	.509**	.200**
		Sig. (2-tailed)	.002	.	.000	.008
		N	172	173	170	172
	PIQ	Correlation Coefficient	.385**	.509**	1.000	.429**
		Sig. (2-tailed)	.000	.000	.	.000
		N	171	170	172	171
	ITC	Correlation Coefficient	.149	.200**	.429**	1.000
		Sig. (2-tailed)	.050	.008	.000	.
		N	173	172	171	174

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

In Table 10, Kendall tau-b coefficients are positive and significant P< .05 (r= .119, P=.029; r= 144 P= .008; r = .316 P=.000) for all the research constructs. Consequently, Spearman correlation coefficients are also positive and significant (r =.149 P=.050; r= .200 P= .008; r = .429 P= .000). As the P-value is <.05 we reject the null hypothesis that assumes no relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use e-government system to conduct transactions. As a result, Jordanian citizens who perceive that e-government system is useful, easy to use, and has a high level of information quality will use e-government system to conduct transactions.

To test hypothesis H6, two statistical tests were carried out: First, the independent sample T Test to examine if there are any differences between male and female citizens in terms of using e-government to gather information or conduct transactions. Table 11 shows that Leven's statistic has a P-value (.130) for F=2.310 which is greater than 0.05. (F is not significant). Therefore, we should assume equal variance. The equal variance line shows that the T value (df= 173) is -3.90441 and the two tail P-value is .000. Therefore, the P-value for a one-tail test is = .000. In this case, T is significant at the .05 level. It is quite clear that there are differences between Jordanian males and females in terms of using e-government to gather information.

and intention to conduct transactions. However, the independent sample T test is not significant (F= .452, P=.502; T= -1.89155, P=.06) P>.05. Thus, there are no differences between male and female Jordanian citizens in terms of using e-government system to conduct transactions.

Table 11: Independent Sample T test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ITG	Equal variances assumed	2.310	.130	-3.90441	173	.000	-3.28799	.84212	-4.95014	-1.62583
	Equal variances not assumed			-4.14810	129.795	.000	-3.28799	.79285	-4.85617	-1.71980
ITC	Equal variances assumed	.452	.502	-1.89155	172	.060	-1.46154	.77267	-2.98667	.06360
	Equal variances not assumed			-1.87238	108.242	.064	-1.46154	.78058	-3.00874	.08566

Second, the One-Way ANOVA test was used to analyze if there are any differences in using the e-government system for gathering information or conducting transactions attributed to the age, level of education, computer experience, and internet experience. The results show that only the level of education (F= 2.871, P < .05) makes a difference when citizens intend to use e-government to gather information but not for conducting transactions

(See Table 12). Thus, we reject the null hypothesis that claims there are no differences between citizens in using e-government system to gather information in terms of level of education.

Table 12: One-Way ANOVA

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
ITG	Between Groups	324.696	4	81.174	2.871	.025
	Within Groups	4806.161	170	28.272		
	Total	5130.857	174			
ITC	Between Groups	159.550	4	39.887	1.747	.142
	Within Groups	3858.065	169	22.829		
	Total	4017.615	173			

From the above data analysis a decision can be made toward accepting or rejecting the research null hypothesis. Table (13) shows the hypotheses and decision of acceptance or rejection for the entire research hypothesis.

Table 13: a summary of research hypothesis and decisions

Null Hypothesis		*decision*
Hypothesis 1	**H0**: Jordanian citizens do not perceive that e-government system is useful, easy to use, and has a high level of information quality.	Rejected
Hypothesis 2	**H0**: Jordanian Citizens do not intend to use e-government system to gather information or conduct transactions.	Partially Rejected
Hypothesis 3	**H0**: There is no relationship between perceived usefulness and intention to use e-government system to gather information or conduct transactions.	Rejected
Hypothesis 4	**H0**: There is no relationship between perceived ease of use and intention to use e-government system to gather information or conduct transactions.	Accepted
Hypothesis 5	**H0**: There is no relationship between perceived information quality and intention to use e-government system to make inquiry or conduct transactions.	Rejected
Hypothesis 6	**H0**: There are no differences between Jordanian citizens in using e-government system for gathering information or conducting transactions in terms of gender, age, level of education, computer experience, and internet experience.	Partially Rejected

8. DISCUSSION, FUTURE RESEARCH, MANAGERIAL IMPLICATIONS, AND CONCLUSIONS.

The results have revealed that Jordanian citizens consider that the e-government system is useful and easy to use but does not have a high level of information quality. In other words, the information that appears in the e-government website does not match citizens' needs. An environment like this will limit the adoption of e-government services and will delay the take up of the e-government system. Additionally, the results show that Jordanian citizens intend to use e-government for gathering information but not for conducting transactions. It then becomes impossible to obtain full usage of e-government and its expected benefits. Thus, an avenue for

future research could be why Jordanian citizens use e-government system for gathering information but not for conducting transactions? As the sample of this research represents well educated citizens, future research could also investigate the intention of other groups within the Jordanian community (students, pensioners, disable people, etc.) to use e-government. Policy and decision makers should rethink and customise e-government strategy to suit each group' needs.

The results also show that perceived usefulness, perceived ease of use, and perceived information quality have a significant positive relationship with intention to use e-government for gathering information. This result is consistent with (Tung & Rieck, 2005; Carter & Belanger, 2005; Hung et al. 2006; Wangpipatwong et al.2008). As a result, when the information in an e-government website is accurate, valid, up-to-date, free of error, and precisely presented, citizens will use this information to implement their tasks. As soon as the citizens are satisfied with the information quality that is presented in the e-government website, a trust-building will take place between citizens and the e-government system (See Kumar et al. 2007). This result provides an empirical root and validity for Kumar et al. (2007) claims. Future research could look at other factors that facilitate e-government intention to use for conducting transactions such as, security, privacy, regulations, financial position of citizens, and individual differences. Thus, much more attention should be paid by policy and decision makers to ensure accurate, valid, up-to-date, sufficient, free-of-error, and precisely present information in the e-government website.

Finally, the results suggest that the Jordanian citizens' gender and level of education play a critical role in using e-government for gathering information but not for conducting transactions. This result is inconsistent with van Dijk et al. 2008, who claim that social-demographic and psychological factors do not influence e-government acceptance and usage. It is expected that citizens who are well educated will continue to use the e-government system. Surprisingly, neither computer experience nor internet experience make any differences in terms of using e-government for gathering information and conducting transactions. This result is unexpected but it looks normal if we take into account that most of the research respondents have a good profile in using computers and internet. Future research could look other demographic variables such as, income level, profession, place of residence, marital status, etc.

Policy and decision makers should focus future efforts to raise the awareness of different groups within the community towards the availability of e-government services. Future research could also investigate what factors determine Jordanian women intention to use e-government for gathering information and conducting transactions.

This research has several limitations, which should be noted. It is worth mentioning that the measures used in this research are based on citizens' perceptions, which might be to some extent subjective. The research has also not taken into consideration the effect of other demographic variables (level of income, marital status, political background, etc.) that might affect intention to use e-government system. In addition, the sample was limited to Jordanian citizens who are already aware of the e-government services. Thus, it is not representative of the whole Jordanian population and therefore the findings should be taken with some prudence, since different groups within the community may have different intention to use. Further, the study has considered the relationship between perceived usefulness, perceived ease of use, perceived information quality and intention to use e-government to gather information and conduct transactions. Nevertheless, it might be other factors which play a crucial role in intention to use (e.g. perceived risk, perceived privacy, perceived security, perceived trust, cultural and political factors, channel of communication, etc).

Despite the above limitations, this study is the first attempt in Jordan to examine empirically the relationship between perceived usefulness, perceived ease of use, perceived information quality, and intention to use. Therefore, the mentioned limitations should be viewed as opportunities for future research. This study proposes conducting more empirical research about the relationship between demographical, cultural, economical, and political factors and intention to use the e-government services from the viewpoint of different groups within the community. Also, it may be valuable to investigate the roles of moderating and intervening variables (e.g. norms, values, residence location, attitude, etc.) on the relationship between perceived usefulness, perceived ease of use, perceived information quality and intention to use. To conclude, this study has contributed to knowledge on both academic and practical levels. Academically, this study extends prior research that investigates citizens' intention to use e-government system (Kumar et al. 2007; Wangpipatwong et al. (2008). Practically, this study has provided several

managerial implications. Bearing in mind that intention to use is divided into gathering information and conducting transactions, it gives more information to decision makers and policy makers on how Jordanian citizens will use e-government services. Therefore, it helps policy-makers to get a sense of citizens' needs and expectations.

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BIOGRAPHY:

Dr. Almahamid received his PhD degree in Management information Systems from University of West of England/ U.K in September 2005. Currently, he is an assistant professor at Al Hussein Bin Talal University. His Research interest include e-government adoption, e-business adoption, Knowledge sharing, Information Quality, and E-business services quality.

Dr. McAdams holds a B.S. in General Studies from Fairfield University, an MBA from the University of Connecticut, and a Ph.D. in Information Systems from Nova Southeastern University. His expertise and research interests include strategy, operations management, and information systems.

Dr. Taher Al Kalaldeh earned his PhD degree in human resource management from Sudan University of Science and Technology in 2007. Currently, he is an assistant professor in Middle East University for Graduate Studies. He is a national expert and accredited trainer in human resource management. His research interests include human resource management systems, knowledge sharing, and ICT adoption.

Dr. Mo'taz Al-sa'eed received his PhD degree in international financial reporting standards from Amman Arab University for Graduate studies in 2008. Currently, he is an assistant professor at Al Balqa' Applied University. His research interests include knowledge management, ICT adoption, E-Government, and accounting information systems.