Critical Factors Influencing the Acceptance and Diffusion of E-Government Services: Conceptual Framework

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***Abstract*— There are some great innovations in e-government during the past decade, and there is intense competition between some governments and leaders in the supply of services on the internet. Some countries do not want to stay behind in this area, where many governments have developed detailed strategies to realize the e-government systems, but there is a problem facing these governments which lack user acceptance of e-government services. The purpose of this study is to suggest comprehensive model to explore and investigate the Factors Influencing the Acceptance and Diffusion of e-Government Services. The proposed Model will develop based on the related literature. The motivation for conducting this study, that it is the first study in the Palestine, that investigate users needs and expectations, where 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 in developing countries. Consequently, the final modified research model has the power to explain and predict user behavior in developing countries and especially Palestine. A thorough understanding of the model may help practitioners to analyze the reasons for resistance toward the technology and also help them to take efficient measures to improve user acceptance and usage of the technology.**

Key Words: **E-Government, E-Government Acceptance, Intention to Use e-government services, Perceived Usefulness, Perceived Ease of Use, User Satisfaction, And Subjective Norm.**

1. Introduction:

People vary in their orientation towards using technology, some of them reject using technology because they do not see the benefit desired from the use or because they see great complexity within them which causes them a lot of trouble in dealing with them, and others have lack of confidence in it, also some organizations face staff resistance or lack of confidence in new technology or computer systems which affect the investment in technology and prevent or impair performance improvement, and thus the inability to perform their duties daily as required to be collected is the failure of the system. In general, the modernization of public services through the adoption of information and communication technologies is in motion. There are around us, evidences of a universal shift toward modern online public services (e-services) and a dynamic e-business environment. This has caused governments and public sector organizations around the globe to take care of this phenomenon, become aware of its potentials and consequently utilize them, thereby triggering investments into e-services.

Since the late 1990s, numerous governments have made huge investments in electronic government services to link government networks and deploy a variety of service infrastructure to provide extensive and proactive services. However, low levels of user acceptance of these services are recognized as an endemic problem for government policy makers, government agencies, and e-Government services providers. Behavioral issues of e-Government research are markedly more important than technological ones. More empirical studies on user acceptance of e-Government services are needed to assist governments in improving the effectiveness and quality of e-Government services. Now the need for discovering determinants of adopting e-Government is enormous, but few empirical studies can be found addressing the issue [1]. In order to achieve the needs of all types of users, the designers have to first understand the

different requirements that users expect, and then relate these characteristics to the design features. In view of the lack of empirical studies on determinants of users acceptance in relation to e-Government, this study represents an important attempt to address user's attitude towards e-Government services. Davis in 1986 introduced a model to explain user acceptance behavior named the Technology Acceptance Model (TAM). The technology acceptance model (TAM) is one of the most widely used models to explain user acceptance behavior. This model is grounded in social psychology theory in general and the Theory of Reasoned Action (TRA) in particular. Based on the above motivation, this study aims to develop an integrative model of users' acceptance of e-Government services for understanding the factors influencing the acceptance and diffusion of e-government services according to Technology Acceptance Model (TAM).

2. Problem Statement

Rarely governments have walked through users' experience to understand their needs. User experience is a key element of e-government systems design. In addition, there are many of e-governments nowadays, but only a small percentage of them ever reach a high ranking or manage to attract more citizens. One of the important issues facing e-government systems is how to assess and measure the acceptance of e-government based on the experience of citizens with e-government systems. Based on the above, we can illustrate the problem statement as follows:

1- Explaining user acceptance of new technology is often described as one of the most mature research areas in the contemporary information systems (IS) literature [1]. It is noted that there are lack in empirical studies on determinants of users' acceptance in relation to e-Government.

2. Most previous studies based on the specific number and not enough of the variables that affect the level of acceptance of e-government services, in this study will be extend the technology acceptance model and add some variables that affect the acceptance of e-government services.

3. The technology Acceptance Model is indeed a very popular model for explaining and predicting system use. To date there have been an impressive number of studies on TAM, a great amount of the research has been conducted in the U.S. and only a limited number of studies have focused on the acceptance of technology outside North America [3], but while several confirmatory results have been obtained, there are skepticisms shared among some researches regarding the application and theoretical accuracy of the model. Consequently, it is tempting conduct that research on TAM may have reached a saturation level, for these reasons we will focus in developing and extending model that would exploit the strengths of the TAM model while discarding its weaknesses, Particular, in line with other countries and cultures outside of North America.

4. The external variables that impact the perceived usefulness and perceived ease of use are not completely explored in the TAM. So, in this study will clarify the impact of the e-government information systems quality on perceived usefulness and perceived ease of use.

3. Objectives of Study

1- Due to the current limited number of studies evaluating e-government services acceptance, the researcher wants to set an example for similar research in the future through the understanding of the factors influencing e-government services acceptance. The goal of this study is to introduce the comprehensive model to gain a deep understanding of citizen experience, to identify factors that affect the behavior towards the acceptance of e-government services.

2- The researcher want to give out some feasible suggestions for decision makers and information systems designers to improve the e-government systems and services based on feedback from users when he apply the proposed model.

3- Develop a model of technology acceptance that will have the power to demonstrate acceptance and usage behavior of e-government services by citizens, also understanding of the model may help practitioners to analyze the reasons for resistance toward the technology and would also help to take efficient measures to improve user acceptance/usage of the technology.

4- As governments are increasingly spending large sums of money for delivering e-government services and availability of limited studies on assessing e-government systems acceptance, developed our interest to conduct research in this area. In addition, to adapting the technology acceptance model (TAM) in the context of e-government systems.

5. Relevance and Significance:

1. Based on a relatively clear description and understanding of models and theories of technology acceptance that has been synthesized from theoretical and practical viewpoints, this study provides a comprehensive model to examine and understand the factors that affect the level of acceptance of e-government services.

2. Knowledge of the needs and expectations of users of e-government services helps systems designers and decision makers to develop and design of systems and services to meet the requirements of the users and raises the level of acceptance of e-services.

3. According to lack in empirical studies on determinants of users acceptance in relation to e-Government, this study provides a theoretical foundation for researching e-Government acceptance continuance in the future.

4. To the practitioners (or governments in this context), this study provides a useful guideline for achieving better e-Government services and increasing the level of acceptance by identifying specific continuance intention factors which are simple, easy to understand, and can be manipulated through system design and implementation. It thereby assists governments in using the findings of proposed model for development and evaluation of e-Government acceptance.

6. Theoretical Background:

Acceptance of a system is a measure of the proclivity to use that system. Without acceptance, there is no inclination to accommodate and include the system within the management process [4]. The successful implementation of information systems (IS) is dependent on the extent to which such a system is used and eventually adapted by potential users [5]. IS implementation is not likely to be considered successful if users are unmotivated to use that type of technology [4]. If users are not willing to accept the information system, it will not bring full benefits to the organization [6], [4]. To predict, explain and increase user acceptance, organizations need to better understand why people accept or reject IS [2]. In this regard, researchers have developed and used various models to understand acceptance of users of IS. Among the different models proposed the Technology Acceptance Model (TAM) [6], adapted from the Theory of Reasoned Action (TRA), and appears to be the most widely accepted among the information system researchers.

The primary goal of TAM is to predict IS acceptance and diagnose design problems before user have experience with the new system. TAM suggests that when user encounter new IS technologies the two main factors influences how and when they will use the system. These two main constructs of TAM are perceived usefulness and perceived ease of use. TAM

proposes that two particular constructs, that are of primary significance for IS acceptance, perceived usefulness (PU) and perceived ease of use (PEOU) affect user's' attitude towards using the information system. While basic constructs of TAM, PU and PEOU, have been considered primary determinants of individual's acceptance and use of technology. IS researchers have investigated and replicated these two constructs and agreed that they are valid in predicting user's acceptance of various IS [5].

In their integration of the technology acceptance literature, the [5] stress the need to extend this literature by explicitly considering system and information characteristics and the way in which they might influence the core beliefs in TAM, and might indirectly shape system usage. Recent studies that have used TAM as a theoretical framework have suggested excluding attitude construct from the TAM model since it does not mediate fully the effect of perceived usefulness and perceived ease of use on behavioral intention as originally anticipated. Recently, the [7] in a research study related to the dimension of IS success suggested that system quality (i.e. information and system quality) affects perceived usefulness, user satisfaction and system usage. According to [8], TAM provides limited guidance about how to influence usage through design and implementation. They further elaborated that as PU and PEOU are abstract concepts and provide general information to the designers. Therefore designers are unable to receive actionable feedback about the important aspects of the IS artifacts itself. They identified information and system quality significant constructs which can affect IS usage. Furthermore, [6] himself noted that future technology acceptance research needs to address how variables affect usefulness, ease of use, and user acceptance.

The [9] examined the adoption of e-government in Australian public citizens based on TAM. Huang, et all's research effort focused on an actual system usage with two constructs, perceived usefulness and perceived ease of use. Their research indicated that the prediction of TAM theory was not supported by the findings. It can be argued that basic constructs of TAM, perceived usefulness and perceived ease of use, may not fully determine users' acceptance of e-government, which therefore brings in the need to search for additional factors that may better predict and enhance the user acceptance of E-Government. Another point that has not been explored well in TAM research is the role of system characteristics as external variables. [10] Did not include other factors explicitly into the TAM model that are expected to impact intentions and usage through PU and PEOU. These external variables could be system characteristics, organizational structure, training, and the like [10].

7. Overview of E-Government:

Many studies have defined e-government in different ways: [11] has defined e-government as the combination of electronic information-based services (e-administration) with the reinforcement of participatory elements (e-democracy) to achieve the objective of "balanced e-government". The [12] defined e-government as the delivery of government information and services online through the internet or other digital means. E-Government has also been defined as the delivery of improved services to citizens, businesses, and other members of the society through drastically changing the way governments manage information [13]. Cited in [14]. It seems that there are a number of e-government definitions in the existing literature. As is clear, most definitions of e-government revolve around the concepts of government's employment of technology, in particular web-based application to improve the access and delivery of government services to citizens, business partners, and other government agencies. Full utilization of e-government will bring a lot of benefits to the management philosophy of many governments and is going to bridge the interaction gap between ordinary

citizens and the government. E-Government can also result in huge cost savings to governments and citizens alike, increase transparency and reduce corrupt activities in public service delivery [14].

8. E-Government Acceptance Theories and Models:

As governments continue to invest heavily in IT, understanding the usage behavior of end users has become an important topic in research on e-government implementation. It is also of increasing practical importance as the usage of IT becomes more pervasive. In recent year, intention-based models, e.g., the theory of reasoned action (TRA) [15], the technology acceptance model (TAM) [6], and the theory of planned behavior (TPB) [16], [17], [18] have been employed to provide an understanding of the determinant of technology usage. Intention-based models use behavioral intention to predict usage and, in turn, focus on the identification of the determinants of intention, such as attitudes, social influences, and facilitating condition [10], [19], [20], [21]. There was considerable empirical support for these intention-based models, and researchers have suggested various ways to broaden their applicability.

8.1. The Theory of Reasoned Action (TRA):

Ajzen and Fishbein developed a versatile behavioral theory and model in 1980 called the Theory of Reasoned Action (TRA). This model forms the backbone of studies associate with attitude-behavior relationships. This has been adapted for use in many fields and is widely used in academia and business today.

TRA is a social-psychological model that addresses the determinants of consciously intended behavior [15], [22]. This model proposes that individual behavior results from conscious intentions to perform that behavior, that is, a behavioral intention. The behavioral intention arises from the individual's own attitude toward the behavior and his or her perception of important others' normative preferences about engaging in the behavior. This normative influence is referred to as the subjective norm. A central proposition of TRA, which has considerable empirical support [15], is that individual behavior is a direct, positive function of behavioral intention, which in turn, is determined by two conceptually distinct constructs: attitude toward the behavior and subjective norm. The [10] found that behavioral intention to use the system is significantly correlated with usage, and that behavioral intention is a major determinant of user behavior while other factors influence user behavior indirectly through behavioral intention (see Figure 1).

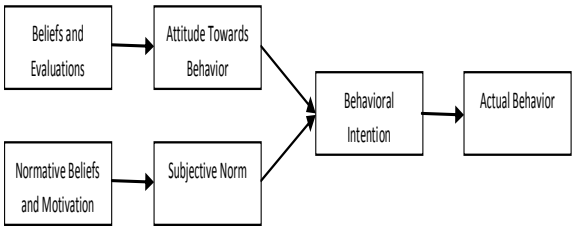

Figure 1: Theory of Reasond Action (TRA) Adopted from [10]

8.2. The Theory of Planned Behavior (TPB):

The Theory of Planned Behavior is proposed as an extension of the Theory of Reasoned Action. The TPB introduced a third independent determinant of intention, perceived behavior control (see figure 2). According to [18], TPB incorporates an additional construct in order to account for situations where an individual lacks the control or resources necessary for carrying out the targeted behavior freely. TPB is a theory that predicts deliberate behavior, because behavior can be deliberative and planned, and TPB is considered to be more general than TRA

[23]. It can be noticed that when given a sufficient degree of actual control over their behavior, people are expected to carry out their intentions when the opportunity arises. In addition, according to the TPB, human behavior is guided by three kinds of beliefs:

1. Behavioral beliefs - beliefs about the likely outcomes of the behavior and the evaluations of these outcomes.
2. Normative beliefs refer to the perceived behavioral expectations of such important referent individuals or groups as the person's spouse, family, friends, and co-workers.
3. Control beliefs - beliefs about the presence of factors that may facilitate performance of the behavior and the perceived power of these factors.

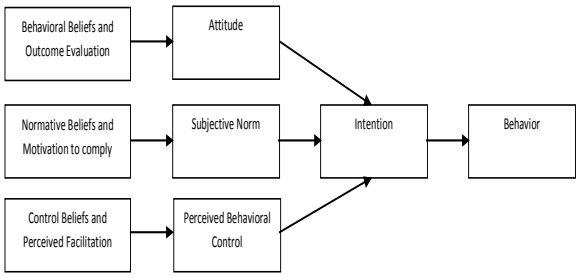

Figure 2: The Theory of Planned Behavior [16]

8.3. The Technology Acceptance Model (TAM):

The technology acceptance model (TAM) is one of the most widely used models to explain user acceptance behavior. This model is grounded in social psychology theory in general and the Theory of Reasoned Action (TRA) in particular [15]. According to the TRA, behavioral intention may be defined as a measure of the strength of one's intention to perform a specific behavior [15]; that is, use an information system.

Davis and his colleagues included two powerful and parsimonious constructs to represent the antecedents of system usage in TAM: Perceived usefulness (defined as the degree to which a person believes that using a particular technology will enhance his or her job performance) and Perceived ease of use (defined as the degree to which a person believes that using a particular technology will be free of effort) [6].

TAM postulated that actual system usage was determined by a behavioral intention to use a system, which was jointly determined by a person's attitude toward using the system and its perceived usefulness. This attitude was also jointly determined by perceived usefulness and perceived ease of use, with perceived ease of use having a direct influence on perceived usefulness. Finally, perceived usefulness and perceived ease of use were directly influenced by the system design characteristics (see Figure 3).

The goal of TAM is to provide an explanation of the determinants of computer acceptance that is in general capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. But because it incorporates findings accumulated from over a decade of IS research, it may be especially well suited for modeling computer acceptance [10].

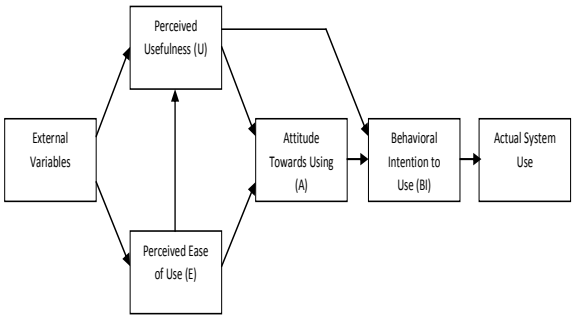

Figure 3: The Technology Acceptance Model [6]

9. Proposed Research Model:

We review the literature in IS fields that is related to e-government acceptance and usage.

The aim of the review is to explicate the potential antecedents of citizen's acceptance of e-Government services and integrate them into a model (see Figure 4).

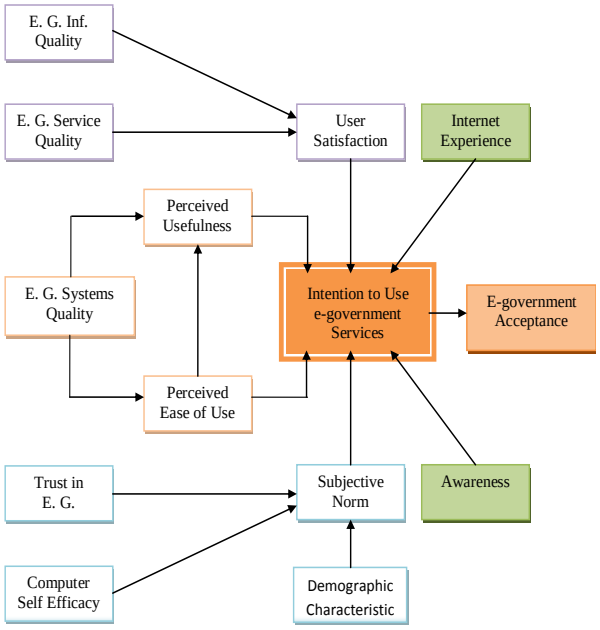

Figure 4: research model

Based on our review of the e-government and IS acceptance literatures related to e-government acceptance and use, we hypothesize that the intention to use e-government services was a major determinant of the e-government acceptance, in turn, we identified perceived usefulness, perceived ease of use, user satisfaction, internet experience, awareness, and subjective norm as antecedents of citizens' intention to use e-Government services, with perceived ease of use having a direct influence on perceived usefulness. The e-government system quality that is likely to influence perceived usefulness and perceived ease of use are also included in the model.

E-Government information quality and E-Government service quality are considered as potential antecedents of user satisfaction. For subjective norm, trust in e-government, computer self efficacy, and demographic characteristics are considered as determinants. Intention to use is taken as the dependent variable of this study.

10. Hypotheses Development:

Based on above, we can develop the research hypothesis as follow:

E-Government acceptance is the actual level of usage by the end users. The acceptance by end users depends primarily on the behavioral intention of the end users. Though the other factors described in the research model also affects the acceptance of the e-government, the direct relation is with the end user behavior intention [24]. Behavioral intention is a measure of the strength of one's intention to perform a specified behavior. Actual use refers to an individual's actual direct usage of the given system. The TAM constructs and the relationships among them are used here because e-government is based on new information technologies, such as the internet and the World Wide Web [24]. Based on previous, we can hypothesize:

H1: Intention to use e-government services has a positive effect on e-government acceptance.

Oliver and Shapiro [25] found that the stronger a person's self-efficacy beliefs, the more likely he or she was try to achieve the desired outcome. In the present context this means that Internet experience should be positively related to the intention to use e-government services, such as WWW service. Therefore, the following hypothesis is proposed:

H2: Internet experience will have a positively associated with intention to use e-government services.

Awareness is a variable associated with people's knowledge about e-Government and the availability of electronic services online. Recent research conducted in Lebanon, which is a

Middle East country with a similar profile to Jordan, indicted that awareness of the existence of e-Government services is positively related to the usage of e-Government services [26]. Based on previous, we can hypothesize:

H3: Awareness will have a positively associated with intention to use e-government services.

User satisfaction is an important component to measure IS success. It can be defined as the extent to which users believe that the IS available to them meets their information requirements [27]. According to TRA/TPB, attitude and behavioral belief measures should be specified in a way that corresponds to the time, target, and context of the behavior of interest, in order to be a good predictor of the behavior or behavioral intention [28]. In our study user satisfaction is treated as an attitude toward intention to use e-government services Therefore, user satisfaction in this study represents both the evaluation of the IS and the evaluation of the usage experience with the IS. Based on the abovementioned discussion we hypothesize that:

H4: User satisfaction has a positive effect on intention to use e-government services.

The Theory of Planned Behavior (TPB) asserts that behavior is a direct function of behavioral intention, and behavioral intention is determined by the individual's attitudes towards performing the behavior, the subjective norms held by the individual, and the individual's perceived behavioral control over the act [18] cited in [29]. Attitude refers to an individual's positive or negative feelings about performing the target behavior. TPB predicts that the more favorable an individual evaluates a particular behavior, the more likely he or she will intend to perform that behavior [30]. Subjective norms reflect the person's perception that most people who are important to him think he should or should not perform the behavior in question. Several empirical studies have shown that subjective norms have a positive and direct impact on behavioral intention, but this influence is usually weaker than that of attitude and perceived behavioral control [22], [31]. Based on previous, we can hypothesize:

H5: Citizen's Subjective norm has a positive effect on intention to use e-government services.

Information quality is related to the quality of information that the e-government delivers to its users [32], their model proposes that "system quality and information quality singularly and jointly affect both use and user satisfaction [33]. Therefore, e-government can be viewed as information systems. Previous studies used information quality to measure IS success [34], measuring e-commerce success [32], and e-shopping acceptance [35]. This study adopts the following hypothesize:

H6: E-Government Information quality is significantly associated with user satisfaction.

Service quality is one of the focuses in IS research as well as e-government research recently. In e-government context, service quality might be an important factor to explain citizen's acceptance of e-services. Hence, examining the quality of e-service could determine whether users tend to continue to use the system or not. It is believed also by offering the best service will entice the citizens to use online services and gain the advantages from it [36]. These arguments have led us to postulate:

H7: E-Government service quality will positively influence user satisfaction.

Davis [6] developed and validated better measures for predicting and explaining use which focused on two theoretical constructs: perceived usefulness and perceived ease of use, which were theorized to be fundamental determinants of system use. TAM theorized that the effects of external variables (e.g., system characteristics, development process, training) on intention to use are mediated by perceived usefulness and perceive ease of use. Perceived

usefulness is also influenced by perceived ease of use because if other things are equal, the easier the system (technology) is, the more useful it can be [4]. Based on above, we can postulate:

H8: Perceived usefulness of e-Government services will positively influence intention to use e-government services.

H9a: Perceived ease of use of e-Government services will positively influence Perceived usefulness of e-Government services.

H9b: Perceived ease of use of e-Government services will positively influence intention to use e-government services.

Trust is an important element of e-government [37]. The [37] defines trust as a belief that others will behave in a predictable manner. The importance of trust in e-government adoption has been stated by many researchers [38], [39]. The [38] argue that trustworthiness is one of the main factors that influence citizens' intention to use e-government service in addition to perceived ease of use and compatibility. Therefore, the effects of trust in e-government on intention to use are mediated by subjective norm, in turn, we can hypothesize:

H10: Citizen's trust in e-government will positively influence citizen's subjective norm.

Compeau and Higgins [40] defined computer self-efficacy as "an individual's perceptions of his or her ability to use computers in the accomplishment of a task". Individuals with a high computer self-efficacy magnitude would see themselves as able to accomplish difficult computing tasks and would judge themselves as capable of operating with less support and assistance than those with lower computer self-efficacy magnitude. Compeau and Higgins [40] also reported that computer self-efficacy plays an important role in shaping an individual's feeling and behavior. Importantly, in the context of e-Government, Wangpipatwong et al. [41] empirically confirmed that the adoption of e-Government websites depends on the computer self-efficacy of citizens. Cited in [42]. Therefore, the effects of computer self-efficacy on intention to use are mediated by subjective norm. Thus, this study proposes:

H11: Computer self-efficacy of citizen will positively influence citizen's subjective norm.

Demography is the available information on any given user or group. Demographic data refers to selected population characteristics which are used to classify people for statistical purposes, such as age, gender, education and experience. Prior research on e-government has identified general demographic characteristics of citizens who use e-government services. Dimitrova & Chen [43] in their exploratory study proposed a multidimensional theoretical framework combining diffusion of innovations and the technology adoption model to explain e-government adoption in the United States. A number of determinants were proposed and tested, going beyond the traditional demographic profiling of e-government users. The main conclusion is that sociopsychological factors affect e-government adoption. Choudrie & Dwivedi [44] in their study found that the demographic characteristics of citizens such as the age, gender, education, and social class have an imperative role in explaining the citizen's awareness and adoption of e-government services in the household [45]. Therefore, the effects of demographic characteristics on intention to use are mediated by subjective norm. Thus, this study proposes:

H12: Citizen's demographic characteristic significantly associated with citizen's subjective norm.

System quality refers to the technical details of the information system interface and quality of system that produces information output [33]. Davis [6] did not include system characteristics into TAM model, but he suggested including

judicious system characteristics. According to DeLone and McLean [33] technology characteristics singularly or jointly affect subsequent use and user satisfaction. Hence, it is assumed that e-government systems quality influence on PU and PEOU. Thus, this study postulates the following hypotheses:

H13a: E-Government Systems quality will have positive effect on PU of e-government services.

H13b: E-Government Systems quality will have positive effect on PEOU of e-government services.

11. Conclusions:

The propositions presented in this paper an opportunity for further investigation in the factors influencing the acceptance and diffusion of e-government services, and e-government acceptance from citizens. The proposed model should be of interest to information systems practitioners, academic community, and decision-makers in e-government. For the practitioner community, the model will enhance their understandings on the factors that contribute towards e-government acceptance. For the academic community, the proposed model provides ample research opportunity to validate in order to support or refute the proposed propositions. And decision-makers in the e-government, that the proposed model will help them to increase level of e-government services acceptance by understanding the needs of citizens and their expectations.

We recommend that other researchers for the work of empirical study on the proposed model in developing countries, especially in Palestine, to know and anticipate the factors that affect the acceptance of e-government services by citizens especially that these countries in initiative stage of construction and implementation of e-government.

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