Antecedents of Trust in E-Government: Palestinian Citizens' Perspective

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ABSTRACT

Many countries in the Middle East region are adopting the e-government portals to provide services to the citizens. Citizens should be satisfied with these portals and judge them as trustworthy in order to participate in the e-government activities as a primary stakeholder. This study aims to investigate the antecedents of trust in e-government in Palestine from citizens' perspective. The proposed model consisted of four main constructs including technical, governmental, risk factors, and propensity to trust in technology, in addition to five demographic characteristics (age, gender, educational level, income, and internet experience). A closed question questionnaire was designed to collect data, 340 valid questionnaires were retrieved. Simple and Multiple regression analysis were used to build an adequate model. Findings revealed that each construct has separately influenced trust level in e-government, but when combined together, technical and governmental factors have positive influence on citizens' trust level in e-government services, risk factors have a negative influence, whereas the influence of propensity to trust was eliminated. Surprisingly, demographic characteristics showed no statistically significant differences in the level of citizens' trust in e-government. These findings may help government official in improving e-government services by enhancing security measures adopted on the e-government portals thus encouraging citizens to use these services

Keywords: E-government; Risk factors; Technical factors; Governmental factors; Propensity to trust in technology

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Antecedentes de la Confianza en la Administración Electrónica: Perspectiva de los Ciudadanos Palestinos

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RESUMEN

Muchos países de la región de Oriente Medio están adoptando los portales de administración electrónica para prestar servicios a los ciudadanos. Los ciudadanos deben estar satisfechos con estos portales y juzgarlos como dignos de confianza para poder participar en las actividades de la administración electrónica como parte interesada principal. Este estudio pretende investigar los antecedentes de la confianza en la administración electrónica en Palestina desde la perspectiva de los ciudadanos. El modelo propuesto se compone de cuatro constructos principales que incluyen los factores técnicos, gubernamentales, de riesgo y la propensión a confiar en la tecnología, además de cinco características demográficas (edad, género, nivel educativo, ingresos y experiencia en Internet). Se diseñó un cuestionario de preguntas cerradas para recoger los datos, y se recuperaron 340 cuestionarios válidos. Se utilizó el análisis de regresión simple y múltiple para construir un modelo adecuado. Los resultados revelaron que cada constructo ha influido por separado en el nivel de confianza en la administración electrónica, pero cuando se combinan, los factores técnicos y gubernamentales tienen una influencia positiva en el nivel de confianza de los ciudadanos en los servicios de administración electrónica, los factores de riesgo tienen una influencia negativa, mientras que la influencia de la propensión a la confianza se eliminó. Sorprendentemente, las características demográficas no mostraron diferencias estadísticamente significativas en el nivel de confianza de los ciudadanos en la administración electrónica. Estos resultados pueden ayudar a los funcionarios a mejorar los servicios de la administración electrónica mediante la mejora de las medidas de seguridad adoptadas en los portales de la administración electrónica, animando así a los ciudadanos a utilizar estos servicios.

Palabras claves: Gobierno electrónico; Factores de riesgo; Factores técnicos; Factores gubernamentales; Propensión a confiar en la tecnología.

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1. Introduction

Palestinian government like many other governments in the Middle East region has digitized a large portion of its public services in an attempt to interact more efficiently with the citizens through electronic channels. During the past two decades, the role of information technology (IT) has grown in an accelerating rate worldwide and the use of electronic services has become the standard for the public sector in judging the performance of governments in transactions processes (Rehouma & Hofmann, 2018).

E-services provided by e-government have a crucial influence on citizens' lives and their relationship with governments (Abu-Shanab, 2014). Adoption of e-government yields many advantages to governments such as reducing service delivery cost, improving operations efficiency, and improving services quality (Rana & Dwivedi, 2015; Abu-Shanab, 2017). On the other hand, e-government provides opportunities for citizen participation to achieve social, economic and political development. This participation is subject to the extent of citizens' trust in e-government (Abu-Shanab, 2019). However, in many countries particularly developing countries citizens still do not use online services due to the lack of trust in e-government applications (Alzahrani, Al-Karaghoul, & Weerakkody, 2017). According to AlAwadhi (2019) citizens' trust in governments was declining during the past two decades due to various reasons such as lack of transparency, political and administrative corruption and policy failures. This has had a negative influence on their perception towards engagement in e-government services (Saeed et al 2018).

Governments, in both developed and developing countries need to identify the potential factors that might have an influence on e-government adoption to implement an e-government strategy (Alomari, Sandhu, & Woods, 2009). Although, there is plenty of research that have examined the relationship between citizens' adoption of e-government and citizens' trust in e-government (Morgeson, VanAmburg, & Mithas, 2010; AlAwadhi, 2019), Akbar (2015) concluded that trust is the main issue that contributes to the diffusion of e-government. The existing studies have not filled the gap in explaining the factors that enhance citizens' trust and engagement in e-government. Moreover, the gap in the developing countries is wider (Alomari, Sandhu & Woods, 2014). The importance of this study comes from the fact the success of e-government concept is mainly depending on the citizens' trust in using the provided services through e-government website. It is expected that the essential factors that may influence citizens' trust in e-government adoption in the Arab World could be different from those associated with Western countries (Obaid et al, 2020). Therefore, this study aims to explore those factors that may influence citizens' trust in e-government in an attempt to fill the gap in the available literature. The findings of the current study forms a basis for future developments of effective e-government procedures and strategies that in turn lead to a higher level of citizens' trust in the services provided by e-government.

The structure of this paper after the introduction section will be as follows: Section 2 will explore the related literature and propose the research model, while section 3 will present the research methodology. Section 4 will report data analysis results. Discussion is presented in section 5, and finally conclusion is drawn in section 6.

2. Literature Review

2.1 E-Government

With the wide spread of the internet technology most countries have introduced the concept of e-government in their national plans (Singh, Das, & Joseph, 2007). A large number of definitions of e-government exist in the relevant literature depending on the context in which it is applied. According to (Yildiz, 2007), three problems are evident in literature, first is the large number of definitions that are normative, the second problem is related to those definitions which are too narrow, and the third problem refers to the ambiguity of some definitions. Regardless of these problems, Yildiz (2007) argued that there are some definitions emphasize the different facets of e-government concept. For

example, Mensah & Mi (2019) defined e-government as the application of Information and Communication Technologies (ICTs) by the government administration systems to ensure and improve interactivity with citizens to provide an efficient and effective delivery of public services to match the expectations of the citizens. Similarly, Santhanam & Ramayah (2018) defined e-government as the applications of ICT, and other communications tools such as mobiles and internet to deliver necessary services to citizens, enhance government agencies performance, to improve public participation and to strengthen relations with citizens, business and other agencies of government. Mensah & Mi (2018) in reviewing definitions of e-government indicated that six themes are implicated in these definitions. First, e-government is about application of Information and Communication Technologies (ICTs); secondly, it is mainly concerned with public sector management; thirdly, improve the delivery of public service to citizens and businesses; fourthly, it concerns with improving efficiency, transparency and accountability; fifthly, it aims to e-participation and lastly it is about improving the performance of public sector organizations. Research concerning the implications of e-government has been increased at an accelerating rate due to the growing interest of public administrations in ICTs (Wirtz & Daiser, 2018). Thus, the continuous advancement in technology offered challenging research questions for academics, mainly what are the major antecedents of citizens' trust in e-government.

2.2 Trust and E-government

The concept of trust is very important in building positive relationships and enhancing interactions between different parties (Alzahrani et al. 2017). In e-government context, it becomes more significant due to the lack of physical interaction between the citizens and the employees as they perform their transactions via electronic channels. Al-Samarraie, Teng, Alzahrani, & Alalwan, (2018) stated that citizens do not trust online services that are provided by governments and prefer personal contact. Nevertheless, trust has been widely investigated and led to significant results when linked to the intention to use e-government services (Abu-Shanab, 2017). Although that the concept of trust in e-government is complex as it involves complicated dimensions that have an influence on citizens' trust in government services (Alzahrani et al. 2017), there is an agreement among researchers that trust plays a crucial role in the implementation of e-government (Dwivedi, Weerakkody & Janssen, 2012; Khasawneh & Abu-Shanab, 2013; Rana and Dwivedi, 2015; Alzahrani et al. 2017; Veeramootoo, Nunkoo, & Dwivedi, 2018). Thus, trust is a salient predictor of e-government success (AlAwadhi, 2019; Alzahrani et al. 2017; Abu-Shanab, 2014; Colesca 2009).

Osman, Anouze, Irani, Al-Ayoubi, Lee, Balci, & Weerakkody (2014) considered user trust as the primary objective of government services and it replaces the price-related outcome in the private sector. Fakhoury & Aubert (2015) and Akbar (2015) considered trust as an asset for the adoption of e-government. On the other hand, Wang & Lu (2011) argued that citizens' trust in e-government is linked with citizens' trust in the internet. Researchers have identified trust as a primary predictor for technology adoption (Abu-Shanab, 2010, Cetin, Kanat, & Ozkan, 2011). Similarly, Abu-Shanab (2014) broke down trust into two dimensions, trust in government and trust in the internet.

In the Palestinian context, trust becomes more significant due to the lack of cooperation between different ministries. This overwhelms every ministry that wants to provide electronic services to the public, in addition to providing the required services, it has to guarantee a secure data transfer process as well as ensuring the privacy of the user (Ayyash, Ahmad, & Singh, 2013).

2.3 Antecedents of Trust in E-government (Trust in G)

New communication technologies and in particular internet websites provide an efficient means for the government to communicate and deliver its services to citizens. Largely, the success of this process depends on public trust in e-government. Thus, it is important to explore those factors that may have an impact on citizens' trust in e-government. Previous research classified antecedents of trust in e-government in different ways. In reviewing the literature (Alzahrani et al., 2017) argued that previous research has concentrated on two dimensions of trust in e-government. These are trust

in technology and trust in the government itself. The logical basis for this view is that trust in technology and trust in government are the primary components of e-government. This implies that citizens' trust in e-government is subject to their level of trust in the government itself (despite of its electronic services), and their level of trust in technology to perform transactions (despite of their opinion about the government). The availability of these two constructs will convey the overall concept of trust in e-government (Abu-shanab, 2019). Although that the existing research focuses on technology side, the current study considered both dimensions as antecedents of trust in e-government.

Abu-Shanab (2014) investigated five proposed antecedents of Jordanians' trust in e-government, namely: trust in government, trust in technology, information quality, internet familiarity and privacy and security. The findings revealed that all the five predictors have significantly influenced citizens' trust in e-government. Alzahrani et al, (2017) examined the impact of gender, age, and internet experience on citizens' trust in e-government. The results showed that females have more confidence in online services than males. It also found that old people show greater trust in e-government than younger people. For the internet experience, the result confirmed the positive influence in trust in online services. Alzahrani, Karaghoul, & Weerakkody (2016) investigated the influence of technology, government agencies, risk, and citizens' characteristic on citizens' trust in e-government. The findings showed a significant positive influence of technical factors and citizens' characteristic while government agencies and risk showed negative influence on trust in e-government. On the other hand, Belanche & Casaló (2015) argued that trust in government increases trust in e-government and contributes in the adoption of e-government. Similarly, Teo, Srivastava, & Jiang (2008) found that trust in government is positively related to trust in e-government, while technology factors have no influence. According to Shareef, Kumar, Kumar, & Dwivedi (2011) uncertainty, security and privacy are the main determinants of trust in e-government. Khan, Rahim, & Maarop (2018) found that ease of use and usefulness of e-government services are positively impact citizens trust in e-government. Among the most important factors influencing trust in e-government are the level of security and the risk perceived by users (Ejdys, Ginevicius, Rozsa & Janoskova, 2019). A study by Beldad, van der Geest, de Jong, & Steehouder (2012) revealed that confidence in online privacy statements positively influences trust in e-government. Perceived usefulness, perceived ease of use, perceived security and perceived risk, are found to have direct impact on the citizen trust in e-government (Liu, & Zhou, 2010). In Palestinian context, the sole study found in the literature was conducted by Ayyash et al., (2013) which aimed to examine the impact of IS factors trust in e-government adoption in the context of Palestinian government ministries. The findings showed that information quality, system quality, service quality, perceived usefulness, perceived ease of use, and security privacy have positive influence on trust in e-government.

It is obvious from the literature review that most studies have concentrated on technology factors and government factors as antecedents of trust in e-government with less focus on other factors like citizen's characteristics and risk considerations. Only three studies found in the literature concentrated on the four factors (Alzahrani, et al., 2017; Beldad et al. 2012 and Colesca 2009). In this study, the four dimensions are integrated to investigate their influence on trust in e-government along with five demographic characteristics: gender, age, educational level, income, and internet experience.

2.4 Research Model and Hypotheses Development

Following the literature review, four constructs are identified as the antecedents of trust in e-government from the citizens' perspective. These constructs are individuals' characteristics, technical factors, governmental factors, and risk factors. The model is basically based on Alzahrani, et al (2018).

2.4.1 Individuals' Characteristics

Regarding the impact of personal characteristics on trust in e-government very few studies investigated this issue. For example, Colesca (2009) found significant positive impact of some individual factors on trust in e-government such as gender, age, disposition to trust, internet experience, and education. Similarly, Alzahrani et al (2018) argued that citizens' characteristics are positively and significantly affect trust in e-government. Familiarity with internet is one of the most individual characteristics that influences trust in e-government (Abu-Shanab, 2014). Colesca & Dobrica (2008) added to the previous factors social class as an antecedent to the confidence in e-government services. Based on this discussion the following hypotheses are proposed:

H1a: Female have more trust in e-government services e-government services than males.

H1b: Younger citizens have more trust in e-government services e-government services than older ones.

H1c: Educational level positively influences citizen' trust in e-government services

H1d: Income positively effects citizens' trust in e-government services

H1e: Internet experience positively effects citizens' trust in e-government services.

2.4.2 Technical Factors

Concerning technical factors, a large number of studies emphasize the importance of these factors in enhancing trust in e-government. The majority of research investigated trust in online services considered technical factors as a primary antecedent of trust in e-government (AlAwadhi 2019; Veeramootoo et al, 2018; Abu-Shanab, 2017; Alzahrani et al, 2016; Ayyash et al., 2013; Khasawneh & Abu-Shanab, 2013). Different approaches have been used to identify the factors of this construct. For instance, The D&M model identified three factors: information quality, service quality and system quality. According to the TAM model usefulness and ease of use are the main factors of technical aspect. This study identified the five factors of both TAM and D&M model.

H2: Technical factors positively influence citizens' trust in e-government.

H2a: Perceived usefulness (PU) has a positive impact on citizens' trust in e-government.

H2b: Perceived ease of use (PEOU) has a positive impact on citizens' trust in e-government.

H2c: Information quality (IQ) positively influences citizens' trust in e-government

H2d: System Quality (SyQ) positively influences citizens' trust in e-government

H2f: Services Quality (SvQ) positively influences citizens' trust in e-government

2.4.3 Governmental Factors

Governmental factors are related to the level of trust and confidence of the citizens towards the government agencies and their beliefs that the government is capable to provide affective services to their citizens (Alzahrani et al, 2016). A large body of research examined the relationship between government agencies and trust in e-government (Wang & Lu, 2011; Beldad et al., 2012; Choudrie, Alfalah, & Spencer 2017; Kurfalı, Arifoğlu, Tokdemir, & Paçin, 2017; Alzahrani et al, 2016). The majority of these studies found a significant and positive influence of trust in government on trust in e-government. In this study the two dimensions of government agencies suggested by (Alzahrani et al, 2018) are adopted: government reputation and past experience. Consequently, the following hypotheses are proposed.

H3: Government agency factors positively influence citizens' trust in e-government.

H3a: Government reputation (GRep) positively influences citizens' trust in e-government

H3b: Past experience (PExp) positively influences citizens' trust in e-government

2.4.4 Risk Factors

Risk is mainly concerned with the issue of privacy and security (Alzahrani et al, 2018). A strong relationship was found between risk and trust in e-government in previous literature (Beldad et al,

2012; Ayyash et al, 2013; Alzahrani et al ,2018; Khan, Rahim & Maarop, 2019; Mensah, 2019). Privacy in e-services context could be defined as the worry about losing control over personal information, whereas security is related to any unauthorized access to the personal data of the individuals (Khan et al, 2019). Providing the e-government website with the necessary security measures and mechanism is not optional, it is critical for its existence and success (Alsmadi, & Abu-Shanab, 2016). Consequently, the following hypotheses are proposed.

H4: Risk factors negatively influence citizens' trust in e-government.

H4a: Privacy concerns (Pri) negatively influence citizens' trust in e-government

H4b: Security concerns (Sec) negatively influence citizens' trust in e-government

2.4.5 Propensity to Trust in Technology

Most researcher studies the concept of propensity to trust in general not in technological context (Beldad et al, 2012; Colesca, 2009; Bélanger & Carter, 2008). They argue that people who have more propensity to trust in people in general, are most likely to have trust in the e-government. In general context, propensity to trust refers to an individual willingness to rely on other (Colquitt, Brent, Scott, & LePine, 2007). Trust in technology can be defined as trust in the reliability of the enabling technology (Bélanger and Carter, 2008). Propensity to trust in technology implies that the user believes that the technology used performs the required tasks satisfactorily. In e-government context, trust in technology is essential for its adoption (Srivastava, & Teo, 2005).

Several studies found strong relationship between propensity to trust in technology and trust in e-government (Bélanger & Carter, 2008; Colesca, 2009; Mohajerani, Shahrekordi & Azarlo, 2015). Based on the above discussion, the following hypotheses is proposed:

H5: Propensity to trust in technology (PTTrst) has appositive influence on citizens' trust in e-government.

The theoretical research model is presented in Figure 1.

Figure 1 Proposed Research Model

Source Prepared by the researchers

3. Data and Methodology

The study is exploratory in nature. It aims to identify those factors that have an influence on citizens' trust in e-government services. A survey was designed and conducted to assess the proposed model and to examine the relationships between the constructs. Questions' items were selected from previous literature as shown in Table (1). The wording was modified to fit the current study context, each item is rated on Five-point scale ranged from (5: Strongly Agree) to (1: Strongly Disagree). The results were analyzed using regression analysis.

Table 1 Study Items

Construct	Items	Sources
Perceived usefulness	<ul style="list-style-type: none"> - I can quickly access information online through e-government portal - e-government services facilitate transparency and accountability - e-government services are more effective - e-government services are useful 	Chen & Aklikokou (2019)
Perceived Ease Of Use	<ul style="list-style-type: none"> - It is easy to learn how to use e-government services - The use of e-government services is clear and understandable - The use of e-government services is flexible - It is easy to use e-government service 	Chen&Aklikokou (2019)
Information Quality	<ul style="list-style-type: none"> - Through e-government services, I get the information I need in time. Information provided by this website is accurate. - Information provided by e-government services is up-to-date. - The level of available information is satisfactory 	Alzahrani et al (2018); and Teo et al., (2009)
System Quality	<ul style="list-style-type: none"> - I find it easy to get e-government services to do what I want it to do. - I believe that e-government services interface is easy to use - Using e-government services doesn't require a lot of effort - Response time is reasonable 	Alzahrani et al (2018); and Teo et al., (2009)
Service Quality	<ul style="list-style-type: none"> - e-government services provide dependable services - e-government services give prompt service to citizens - e-government services are responsive to citizens' requests - In general, the level of the provided services is satisfactory 	Teo et al., (2009)
Past Experience	<ul style="list-style-type: none"> - My online transactions with government organizations have always been good - I have no negative experiences in transacting online with government organizations - In general, my previous transactions with e- government were satisfactory 	Beldad et al. (2012)
Government Reputation	<ul style="list-style-type: none"> - Government ministries have the reputation of taking the interests of the citizens into consideration during online transactions. - Government ministries have the reputation of being honest in carrying out online transactions with citizens. - Government ministries have the reputation of being competent in carrying out online transactions with citizens 	Beldad et al., (2012)
Privacy	<ul style="list-style-type: none"> - My personal information given to a government website may be shared with other governmentagents to whom I do not want to provide the information - Government websites may allow another party access to my personal information without my consent. - My personal information may be used in an unintended way by the government agency 	Alzahrani et al., (2018)

Security	<ul style="list-style-type: none"> - Hackers may be able to intrude into government websites and steal my personal information stored on the web. - I would not feel secure sending sensitive information to e-government websites - Overall, it is not safe sending sensitive information to e-government websites 	Colesca(2009)
Propensity to Trust in Technology	<ul style="list-style-type: none"> - I believe the technologies supporting the system are reliable all the time - I believe the technologies supporting the system are secure all the time - Overall, I have confidence in the technology used by government agencies to operate the e-government services 	Colesca (2009)
Trust in e-Government	<ul style="list-style-type: none"> - I expect that e-government services will not take advantage of me. - I believe that e-government services are trustworthy - I believe that e-government services will not act in a way that harms me - I trust e-government services 	Colesca (2009)

Source: Developed by the researchers based on literature review

3.1 Reliability

The reliability of these items was tested using Cronbach Alpha Coefficient as shown in Table (2). All of the coefficient values were above the cutoff value of 0.7 determined by (Nunnally, 1978) as the acceptance measure for reliability.

Table 2. Cronbach Alpha Coefficient of the suggested model variables

Variable	Mean	Standard Deviation	Cronbach Alpha Coefficient
PU	3.94	0.733	0.861
PEOU	3.89	0.867	0.856
IQ	3.81	0.870	0.862
SyQ	3.87	0.791	0.837
SvQ	3.79	0.896	0.881
GRep	3.61	0.993	0.909
PExp	3.84	0.801	0.885
Pri	2.25	0.673	0.767
Sec	3.58	1.075	0.897
PTrst	3.62	0.902	0.876
TrstinG	3.71	0.834	0.817
Total			0.951

Source: Developed by the researchers based on statistical analysis

3.2 Sampling

Palestinian citizens who use e-government services represent the population of this study. However, it is almost impossible to draw a random sample from this population directly as a large portion of ordinary citizens in Palestine may not use such services. Thus, the employees of the two largest governmental agencies were targeted as the study sample. The questionnaire was administered to 400 Palestinian public sector employees selected from the Ministry of Education and the Ministry of Health to represent the Palestinian citizens as they have regular access to the internet and they are the most likely users of governmental services. According to the health annual report 2018 published by the ministry of health in June 2019, the number of employees is 13,950. The number of employees in the Ministry of Education is 47,833 based on the statistics provided by the

General Personnel Council (2016). Therefore the population size is 61,783. According to Daniel and Cross (2013) equation, the required sample size that should be drawn from the population at 5% significance level is 382. The researchers retrieved 361 questionnaires, 21 were excluded for insufficient filling, yielding 340 valid questionnaires for analysis with response rate 89%.

4. Results

4.1 Demographic Profile:

Table (3) presents demographic profile of the surveyed citizens:

Table 3 Respondents' Demographic Profile

Demographic Category	Classification	Frequency	Percent %
Gender	Male	161	47.4
	Female	179	52.6
	Total	340	100
Age	20-29 Years	94	27.6
	30-39 Years	96	28.2
	40-49 Years	92	27.1
	>=50 Years	58	17.1
	Total	340	100
Educational Level	High School	18	5.3
	Diploma	78	22.9
	Bachelor	179	52.6
	Post Graduate Studies	65	19.1
	Total	340	100
Monthly Income	200-500 JD	77	22.6
	501-1000 JD	122	35.9
	1001-1500	83	24.4
	>=1500 JD	58	17.1
	Total	340	100
Internet Experience	Less than one year	18	5.3
	1-5 Years	75	22.1
	6-10 Years	103	30.3
	>10 Years	144	42.4
	Total	340	100

Source: Developed by the researchers based on data analysis

As Table (2) illustrates, the population sample is made up of 47.4% males and 52.6% females, with 28.2% of the respondents within the age group of (30-39 years), followed by age group (20-29 years) forming 27.6%, then (40-49 years) with 27.1% and last comes the age group (>=50 years) with 17.1%. Regarding the educational level, the majority are holding a Bachelor degree (52.6%), next are Diploma holders (22.9%), followed by the employees who hold a Post Graduate Degree (19.1%), lastly are those with High School Certificate (5.3%). Concerning monthly income, 35.9% of the respondents earn 501-1000 JD per month, followed by the respondents with a monthly income of 1001-1500 JD (24.4%), thirdly, respondents with 200-500 JD per month forming 22.6% of the study sample, and at last are the respondents with >=155 JD with 17.1%. The last demographic characteristic is the internet experience of the employees. 42.4% of the sample have an experience in using the internet for >10 years, next are the respondents with an experience of 6-10 years (30.3%),

next are the respondents with 1-5 years' experience forming 22.1% and lastly are those with experience less than one year making 5.3% of the study sample.

4.2 Hypotheses Testing

In order to test the hypotheses, ANOVA analysis is used to test hypotheses H1a through H1e, since these hypotheses are to examine the existence of statistical differences in respondents' trust level in e-government based on their demographic characteristics. On the other hand, simple linear regression is used to examine the influence of the other constructs on trust in e-government, and finally multiple linear regression is used to examine the overall influence of all of these constructs on trust in e-government.

4.2.1 ANOVA Analysis (H1a...H1e)

To test each of the hypotheses related to each of the demographic characteristic, a separate ANOVA test is conducted. Table (4) summarizes the results.

Table 4. ANOVA Analysis Results of the demographic characteristics

Demographic Category	Classification	Mean	St. Deviation	F Value	Sig.	Decision
Gender	Male	3.40	.504	0.226	0.634	Reject H1a
	Female	3.43	.510			
	Total	3.42	.507			
Age	20-29 Years	3.35	.512	0.996	0.395	Reject H1b
	30-39 Years	3.45	.509			
	40-49 Years	3.38	.530			
	>=50 Years	3.48	.459			
	Total	3.41	.507			
Educational Level	High School	3.39	.543	0.623	0.601	Reject H1c
	Diploma	3.39	.471			
	Bachelor	3.39	.537			
	Post Graduate Studies	3.49	.455			
	Total	3.42	.507			
Monthly Income	200-500 JD	3.35	.512	0.996	0.395	Reject H1d
	501-1000 JD	3.45	.509			
	1001-1500	3.38	.530			
	>=1500 JD	3.48	.459			
	Total	3.42	.507			
Internet Experience	Less than one year	3.21	.503	1.345	0.260	Reject H1e
	1-5 Years	3.38	.469			
	6-10 Years	3.46	.468			
	>10 Years	3.43	.549			
	Total	3.42	.507			
significant at $\alpha<0.05$						

Source: Developed by the researchers based on ANOVA analysis

As Table (4) shows, no significant statistical differences exist between the surveyed employees based on each of the examined demographic characteristic since the calculated F values were not significant, consequently this leads to reject H1a, H1b, H1c, H1d, and H1e.

4.2.2 Simple Linear Regression of (H2 ... H5)

In order to test hypotheses H2, H3, H4 and H5, the researchers conducted a two-step linear regression. First separate influence of each variable in the construct is examined to test the sub-hypotheses, and then the overall influence of the construct is examined to test the main hypotheses.

4.2.2.1 Hypothesis H2.

The second hypothesis consists of five sub-hypotheses (H2a through H2e). The results of the simple linear regression of each of these sub-hypotheses as well as the overall impact of Technical Factors are shown in Table (5).

Table 5. Simple Linear Regression results of H2

Variable	R ²	Adjusted R ²	Std. Error of the Estimate	Unstandardized Coefficients B		Standardized Coefficients Beta	t	P-value	Decision
1. PU	.214	.212	.44999	Constant	2.122	.463	15.518	.000*	H2a Supported
				PU	.328		9.607	.000*	
2. PEOU	.187	.185	.45773	Constant	2.313	.433	18.160	.000*	H2b Supported
				PEOU	.283		8.824	.000*	
3. IQ	.175	.172	.46126	Constant	2.385	.418	19.186	.000*	H2c Supported
				IQ	.270		8.458	.000*	
4. SyQ	.236	.234	.44366	Constant	2.102	.486	16.103	.000*	H2d Supported
				SyQ	.339		10.231	.000*	
5. SvQ	.191	.189	.45667	Constant	2.379	.437	20.068	.000*	H2e Supported
				SvQ	.274		8.933	.000*	
6. Technical Factors	.272	.270	.43330	Constant	1.853	.521	13.132	.000*	H2 Supported
				Technical Factors	.404		11.228	.000*	

*significant at $\alpha < 0.05$; Dependent Variable is Trust in e-government (TrstinG)

Source: Developed by the researchers based on regression analysis

Table 5 illustrates that H2a, H2b, H2c, H2d, and H2e are supported and the variables associated with these sub-hypotheses are found to have a positive influence on citizens' trust in e-government since p-value is less than 0.05. System quality has the strongest influence (standardized $\beta = 0.486$), whereas information quality has the weakest influence (standardized $\beta = 0.418$). Additionally, the overall influence of the technical factors have been found to be significant with $\beta = 0.521$, thus supporting H2.

4.2.2.2 Hypothesis H3.

The third hypothesis consists of two sub-hypotheses (H3a and H3b). The results of the simple linear regression of each of these sub-hypotheses as well as the overall impact of Technical Factors are shown in Table (6).

Table 6. Simple Linear Regression results of H3

Influence	R ²	Adjusted R ²	Std. Error of the Estimate	Unstandardized Coefficients B		Standardized Coefficients Beta	t	P-value	Decision
1. PExp	.267	.265	.43464	Constant	2.137	.517	18.178	.000*	H3a Supported
				PExp	.333		11.101	.000*	
2. GRep	.234	.231	.44449	Constant	2.450	.483	24.971	.000*	H3b Supported
				Grep	.267		10.149	.000*	
3. Governmental Factors	.296	.294	.42598	Constant	2.099	.544	18.615	.000*	H3 Supported
				Governmental Factors	.353		11.923	.000*	

*significant at $\alpha < 0.05$; Dependent Variable is Trust in e-government (TrstinG)

Source: Developed by the researchers based on regression analysis

Table 6 illustrates that the two sub-hypotheses (H3a, H3b) that composite H3 are supported and the variables associated with these sub-hypotheses are found to have a positive influence on citizens' trust in e-government since p-value is less than 0.05 for both variables. Past experience has a stronger influence (standardized $\beta = 0.517$) than government reputation (standardized $\beta = 0.483$). Additionally, the overall influence of the governmental factors have been found to be significant ($\beta = 0.544$), thus supporting H3.

4.2.2.3 Hypothesis H4.

The fourth hypothesis consists of two sub-hypotheses (H4a and H4b). The results of the simple linear regression of each of these sub-hypotheses as well as the overall impact of Risk Factors are shown in Table (7).

Table 7. Simple Linear Regression results of H4

Influence	R ²	Adjusted R ²	Std. Error of the Estimate	Unstandardized Coefficients B		Standardized Coefficients Beta	t	P-value	Decision
1. Pri	.046	.043	.49602	Constant	3.855	-.213	34.170	.000*	H4a Supported
				Pri	-.195		-4.018	.000*	
2. Sec	.003	.000	.50694	Constant	3.307	.055	30.156	.000	H4b Not Supported
				Sec	.030		1.022	.308	
3. Risk Factors	.004	.001	.50669	Constant	3.595	-.064	23.045	.000*	H4 Supported
				Risk Factors	-.062		-1.173	.000*	

*significant at $\alpha < 0.05$; Dependent Variable is Trust in e-government (TrstinG)

Source: Developed by the researchers based on regression analysis

Table 7 illustrates that H4a is supported whereas H4b is not. The respondents' concerns about their privacy and their fear from any possible violations of their personal data negatively influence their trust level towards using e-government services (standardized $\beta = -0.213$). On the other hand, surprisingly security issues have been found to be insignificant (p-value > 0.05). Respondents' concerns about the level of security associated with their transactions with e-government has a minor correlation with their trust in e-government (standardized $\beta = 0.055$). The overall influence of

the governmental factors have been found to be significant with a negative influence on trust in e-government ($\beta = -0.064$), thus supporting H4.

4.2.2.4 Hypothesis H5.

The fifth hypothesis test the influence of the respondents propensity to trust in technology on their trust in e-government. The results of the simple linear regression are shown in Table (8).

Table 8. Simple Linear Regression results of H5

Influence	R ²	Adjusted R ²	Std. Error of the Estimate	Unstandardized Coefficients B		Standardized Coefficients Beta	t	P-value	Decision
1. PTrst	.180	.178	.77058	Constant	2.499	.424	22.896	.000*	H5 Supported
				PTrst	.253		8.619	.000*	
*significant at α=0.05; Dependent Variable is Trust in e-government (TrstinG)									

Source: Developed by the researchers based on regression analysis

Table 8 illustrates that propensity to trust in technology has a positive influence on citizens' trust in e-government (standardized $\beta = 0.424$). Thus, supporting H5.

4.2.3 Multiple Linear Regression

The researchers used multiple linear regression to examine the combined influence of technical factors, governmental factors, risk factors, propensity to trust in technology and their interactions on employees' trust in e-government. Table (9), Table (10) and Table (11) summarize the results:

Table 9. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.592 ^a	.350	.343	.41102

Source: Developed by the researchers based on regression analysis

Table 10. ANOVA^b

Model	Sum of Squares	Df	Mean Square	F	P-value
1 Regression	30.538	4	7.634	45.192	.000 ^a
Residual	56.593	335	.169		
Total	87.131	339			

a. Predictors: (Constant), PTrst, Risk_Factors, Technical_Factors, Governmental_Factors

b. Dependent Variable: TrstinG

Source: Developed by the researchers based on regression analysis

As shown in Table (10), the overall model is significant ($F=45.192$, $p\text{-value}=0.000$) which indicate a good fit of the data, Table (9) shows that the determination factor R^2 is equal to 35%, which means that the examined constructs explain about 35% of the change in citizens' trust in e-government. Table (11) illustrates the influence of each independent construct, the largest influence is for the governmental factors (standardized $\beta = -0.303$, $p\text{-value} = 0.000$), followed by technical factors (standardized $\beta = 0.247$, $p\text{-value} = 0.000$), then risk factors (standardized $\beta = -0.144$, $p\text{-value} = 0.000$) and finally propensity to trust in technology (standardized $\beta = 0.122$, $p\text{-value} = 0.051$). Although that propensity to trust in technology is found to be significant when examined separately, in the multiple regression model it becomes insignificant ($P\text{-value} > 0.05$) this significance is undermined by the effect of other independent variables.

Table 11. Coefficients of Multiple Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	P-value	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.106	.172		12.243	.000		
Technical_Factors	.192	.054	.247	3.542	.000	.398	2.511
Governmental_Factors	.197	.046	.303	4.265	.000	.383	2.608
Risk_Factors	-.139	.043	-.144	-3.224	.001	.976	1.024
PTrst	.067	.034	.112	1.955	.051	.593	1.688

a. Dependent Variable: TrstinG

Source: Developed by the researchers based on regression analysis

Based on the multiple regression analysis results, Equation (1) is formulated which predicts the employees trust level in e-government using the three significant constructs:

$$\text{Citizens' Trust in e-government} = 2.106 + 0.192 \text{ Technical_Factors} + 0.197 \text{ Governmental_Factors} + 0.139 \text{ Risk_Factors} \quad (1)$$

The Variance Inflation Factor (VIF) is calculated as shown in the last right column of Table (11) to ensure that no multicollinearity exists between the independent variables. As values of VIF's are less than 5, nocollinearity exist between the independent variables (Rogerson, 2001).

5. Discussion

Many researchers have examined the factors that contribute in the adoption of e-government in many countries. This study integrated four constructs (technical factors, governmental factors, risk factors, and propensity to trust in technology) in addition to the demographic characteristics of the citizens participating in the study. Regarding the demographic characteristics, the findings showed unexpected results as no statistically significant differences in the level of citizens' trust in e-government according to these characteristics were found. Concerning gender, the findings matches the findings of Colesca (2009), AlAwadhi (2019), and Alzahrani et al, (2018) who indicated that the difference between males and females is not significant. One possible reason for this insignificance is that the use of internet and internet-supported systems is accessible for both males and females; therefore gender is no more a determining factor (Lavanya and Karthikeyan, 2016). On the other hand, it contradicts the findings of Venkatesh&Venkatraman (2014) who pointed that men tend to trust in e-government more than women do; as well as Mutimukwe, Kolkowska&Grönlund (2017) who found that men were more reluctant to use e-government services than women. For Age, the results of the current study contradicts the findings of Colesca (2009) who found that age negatively influence trust level in e-government, while matches the findings of AlAwadhi (2019). For the third demographic characteristic, educational level, the current study results coincide with the results of AlAwadhi (2019) and Colesca (2009) who did not find significant differences. This could be justified as the opportunity of using these services is opened to all employees at the same degree, therefore citizens judge and consequently trust in e-government services based on their own experiences with the system. This result is opposite to the findings of Venkatesh&Venkatraman (2014) who pointed that educational level positively influence trust level in e-government, and Sharma(2015) who had shown that the respondents' educational level determined their willingness to adopt and use e-government service in Oman. Relating to monthly income, the findings support the findings of (Colesca, 2009) and not supporting the findings of Venkatesh&Venkatraman (2014) who indicated that monthly income positively influence trust level in e-government services. For the last characteristic internet experience, the results are contradictory to the findings of Colseca (2009),

Beldad et al, (2012), and Alzahrani et al, (2018) who stated that respondents with greater experience show more trust in e-government. On the other hand, these findings are in line with the findings of Abu-Shanab (2019).

After all, despite the fact that no significant statistical differences exist, Table (4) shows that mean scores are mostly high ($3.41 \leq \text{score} \leq 4.2$), with some moderate scores ($2.61 \leq \text{score} \leq 3.4$) particularly for citizens with internet experience less than one year. This indicates that citizens in general have a positive attitude towards trusting e-government services.

For the second hypothesis, the findings revealed that technical factors significantly influence trust level in e-government. This result seems logical, when the system that provides the intended service is useful, easy to use, availing accurate and timely information, reliable, and responsive to the users' enquiries, the users' trust level in the system is expected to rise. The current study examined five technical factors (perceived usefulness, perceived ease of use, system quality, service quality and information quality), the findings relating to system quality, service quality and information quality are in line with the findings of Alzahrani et al, (2018). The findings concerning the other two factors are supported by the findings of Colseca (2009) who found that perceived usefulness positively influence trust in e-government, and Chen & Aklikokou (2019) who found a significant influence of perceived ease of use on intention to use e-government system.

Governmental factors in the current study have the strongest influence of the citizen trust in e-government. This result is consistent with Beldad et al, (2012) and Alzahrani et al, (2018). Governments have a critical role in gaining users' trust in the e-government system and maintaining these users as regular ones. This could be achieved by providing high quality services to the users particularly those who are new to the system, as the users' past experience is a determining factor of trust. Furthermore, government reputation is also vital for encouraging users to use e-government services, if the government agencies are trustworthy in the traditional form of providing services through offices and departments, this may positively influence their e-services, particularly that Colseca (2009) revealed that perceived governmental trustworthiness will positively influence the trust in e-government services.

Regarding risk factors, two variables are included in the current study: privacy and security concerns. Privacy concerns are found to negatively influence trust level in e-government, thus supporting H4a. Citizens' concerns about their personal information and the possibility of using these information either intentionally or accidentally by other parties undermine their trust level in e-government. As the users of the system perceive that their information are secured enough and can't be used in any actions that violate specific laws their trust in the e-government is enhanced (El-sofany, Al-Tourki, Al-Howimel & Al-Sadoon, 2012). This complies with the findings of previous research such as Alzahrani et al (2018) and Colseca (2009); but contradicts the finding of Malik, Shuqin, Mastoi, Gul, & Gul (2016) who found that privacy and security issues were not among the significant predictors of Pakistani citizens' satisfaction towards e-government portal.

Regarding security issues, previous research showed mixed results, while some studies found a negative significant influence of security issues on trusting e-government services (Alzahrani et al, 2018), others found either no influence or positive influence (Malik et al, 2016; Beldad et al. 2012). The findings of the current study regarding security could be justified as the respondents are not aware of the technical security procedures implemented by the government that ensure safe transactions, uploading and transfer of data. Although that security concerns are not significant, the overall influence of risk factors is significant.

As for the last independent variable, propensity to trust in technology, the findings show that it has a significant positive influence on citizens' trust in e-government when examined alone. In the multiple regression model, this influence has become insignificant.

6. Conclusion

Governments in the Middle East region are employing information and communications technologies in their processes to deliver services to their citizens. Trust in these technologies and the e-government portals is a corner stone in the citizens' acceptance and participation in these services. This study aimed to explore the antecedents of trust in e-government from citizens' perspective. The proposed model hypothesized four relationships between four selected constructs as well as five demographic characteristics. The researchers analyzed the gathered data using simple and multiple regression analysis. with respect to demographic characteristics, despite that fact that no significant statistical differences exist in trust level in e-government among the respondents, but the trust in e-government scores were high reflecting that employees are trusting in the e-government.

With regard to the influence of each independent construct, all of the proposed constructs significantly influenced trust level in e-government when examined separately. Whereas only technical factors, governmental factors and risk factors had significant influence on trust level since propensity to trust in technology impact was eliminated by the other factors. Consequently, the paper concludes that technical factors and governmental factors positively influence trust level in-government, whereas risk factors had a negative influence on trust level. As the Palestinian government have started implementing e-government service in the public sector, understanding the impact of the examined constructs in this study would help in improving these services and ultimately achieving a higher level of trust among the citizens. Enhancing security measures adopted on the e-government portals would raise the level of trust and encourage the citizens to participate in e-government transactions that require the disclosure of personal information. Supporting the e-government portals with the necessary trustworthiness cues as an easy to read and understand, available and findable privacy statement may enhance the level of trust towards the e-government services.

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Conflict of interest

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