

## Factors for extending e-government adoption in Jordan

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### ABSTRACT

This article establishes an e-government adoption structure to survey the mediating roles of perceived usefulness (PU), perceived ease of use (PEOU), & trust, as well as the moderating role of transparency, in citizens' adoption of e-government services in the Jordanian public sector institutes. A quantitative approach using the questionnaire method was employed to test this model. Based on a snowball sampling, 423 questionnaires were staff of public universities in Jordan. Structural Equation Modelling was used to analyze the data. The findings show that PU and PEOU have a significant impact on service quality (SQ). Furthermore, PU, PEOU has a significant association with the adoption of e-government. More likely, the study found a link between SQ and e-government adoption through PU and PEOU. Also; trust plays a mediating role among PEOU and e-government adoption. It also shows that accountability enhances the PEOU's commitment to e-government adoption. This article adds to e-government analysis from a theoretical as well as practical viewpoint. Theoretically, this research established a conceptual context for a greater understanding of e-government implementation in Jordanian public universities. Nonetheless, this article provides a comprehensive review of the acute causes for e-government adoption to provide practical input to Jordanian decision-makers on how to convince Jordanians to embrace e-government.

**Keywords:** E-government adoption, Jordanian universities, Transparency, Trust

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### 1. Introduction

Organizations have been fighting among themselves in this century to thrive in this era of globalization. Not only companies but each country's government sectors also face challenges and strive to find the most effective way to provide quality services to their people. To boost the delivery and distribution of government services and intelligence, state agencies are rapidly developing and prioritizing intelligence and communication technologies [1, 2]. Using the internet as an effective instrument to provide government services through digital means to the benefit of the public and organizations [3, 4]. As a result, the government now has a new way of engaging with its people due to this internet and ICT assessment[5]. Furthermore, as people become more internet savvy and have firsthand experience with high-quality e-Services from government agencies, such as E-commerce, and other forms of electronic services, the market for high-quality electronic services (e-Services) from government agencies will rise. People expect government institutions to provide high-quality e-services in the delivery of public services as a result[6]. As an outcome, the government launches (e-government) policies to address customers' desires and to put a premium on the internet's exponential growth in popularity. For the residents' and government's good [7, 8]. E-government is a method of electronic service delivery that seeks to increase the accountability and governance of government services and, as a result, enhance government efficiency [9, 10]. Numerous governments around the world are still grappling with the pressing issue of citizens' little use of E-government services, despite excellent efforts in this region[11, 12]. Although the Jordanian E-government plan has placed for more than fifteen years, it has failed to high levels of social interaction with E-government services [13-15] Studies conducted by the United Nations have confirmed this fact. The decline in Jordan's e-government index from 50 in 2010 to 98 in 2018 (UN, 2010, 2018) can be summed up as a little level of national use of electronic government facilities, which is shown in figure

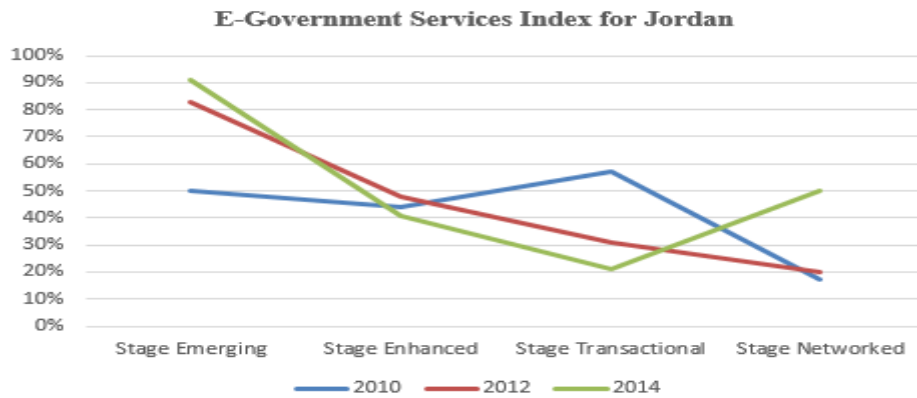


Figure 1. E-Government services index for Jordan

Although Jordan is an emerging state (World Bank 2017), this is one of the regional level major nations for online services in terms of national IT existing infrastructure. The motivation and capacity of the population to conduct online trades is also one of the highest regionally [16]. Hussein Al-Yaseen, Anas Ratib Al-Soud and Saheer Al-Jaghoub [17] found 74.1 percent replied 'Yes' when people of Jordan were asked if they understood what is the value of e-government in our country. More than 75 % of the members did not personally know about E-government programs or relevant websites when uniquely asked a similar question within the study. Furthermore, the analysis showed that more than 85 percent of respondents had never signed into or accessed any info on the e-government website. It demonstrates a critical requirement to consider the viewpoints of people on facilities included in E-Govt in Jordan to make residents aware of & to accept the electronic services. Jordanian e-government projects seek to increase government service delivery quality through reshaping and promoting public connectivity through new ICTs[18, 19]. This aims to provide electronic tools to improve government productivity and people's political lives[20, 21]. Nonetheless, there are concerns about the trustworthiness and quality of Jordan's e-government systems. Performance is a necessary factor of long-term progress in elect-commerce in dissimilar fields. In e-government, quality of service is attracted because of its value to people by supplying them with their needs and needing online[22]. Conceptualizing and assessing e-government facilities is based on the satisfaction of the residents[23]. The researcher would focus on customer satisfaction to recognize the initial challenges of e-government services, and the quality of e-government services can be calculated by user reviews & upcoming usage plans. These concerns are relevant as the efficiency of e-government systems would help in evaluating citizens' expected uses. The path to E-government acceptance in the cities of Jordan is trust, as stated earlier[24]. Trust is a central problem that undermines Jordan's decision to use e-government services, which theoretically does not boost competition for e-government services. Citizens' willingness to believe is determined by several variables, including trust in their government, faith in technology, e-government knowledge, website quality, risk aversion, confidence aversion, and expectations of protection and privacy. The problems of trust and quality in e-government systems are still present [24]. Confidence is the common factor driving E-government adoption [25, 26], and it has a positive effect on behavioral intentions to use the services[27]. People must have confidence in their government to have the requisite administrative and technological services to enforce and secure these online systems. The purpose of this study was to look into the effect of customer service efficiency, perceived usefulness (PU), and perceived ease of use (PEOU) on E-government acceptance in Jordanian government educational institutions. The effect of PU, transparency, and PEOU on mediation will be explored further in the study. Transparency's effect on e-government implementation is also moderated at the same time.

## 2. The relationship between citizen service quality and perceived usefulness

Adee Athiyaman [28], defines perceived service quality "as an overall evaluation of the goodness or badness of a product or service." It is reasonable to assert that the interactions between perceived usefulness (PU) and service quality (SQ) may explain more variance in user continuance intention than do the simple main effects [29]. Customers may continue to use a useful service because they are satisfied with the SQ [30].

PU has been described as a vital cognitive conviction for technology adoption in many contexts. In SQ contexts such as e-commerce, Higher Education, online banking, and mobile networks, it is relevant [31-34]. Using SQ measurements as antecedents to TAM constructs, Zhou and Xu discovered that knowledge accuracy is the most distressing element for PUs[35]. Finally, the literature about SQ and PU and PEOU is very limited, according

to Ahmed Elmorshidy [36] recommended using SQ and technology acceptance model together in another sector. In the background of the study, strong SQ strengthens cognizance of the utility of E-government from the viewpoint of people[37]. Public sector quality online inevitably affects citizens' judgment on e-government implementation[38]. That means providing reliable public service will boost citizens' perception of e-government's utility. People would find e-government beneficial if they feel their desires for public services can be addressed easily electronically. V. Chen, Jubilado, Capistrano, and Yen [39], for example, say that an improved SQ would help people enjoy the paybacks of e-government adoption. because of the above debate, the hypothesis is proposed:

**H<sub>1</sub>:** Citizen service quality has a significant influence on perceived usefulness.

### **2.1. The association among citizen service quality and perceived ease of use**

Service quality is described by Parasurman, Zeithaml, and Bery (1988) as an international assessment or approach relating, to the whole excellence or supremacy of the service, as well as a general assessment of the pros and cons of a service. Quality is a powerful element of a customer's preferences for any good or service, and it is a vital criterion for a service-oriented enterprise [40]. Several previous longitudinal studies have found a correlation between perceived ease of use & service quality in various contexts. According to the findings of the report, the PEOU is a major positive association with the efficiency of e-banking facilities (Alsamydai, 2014). Learning Management System [41] study explored. The students' perceptions of using the Learning Management System found an association among service quality & PEOU and influenced their learning attitude and intention to use. And mobile service [42, 43] PEOU has been identified as the primary construct for examining and assessing user acceptance of telecommunication services, and it essential motivational factor for customer service. Superior quality electronic public facilities would indirectly help achieve higher PEOU rates for e-government adoption, according to the report's context[37]. People would invest less money in e-government programs if government agencies improve the excellence of their online public facilities[44]. This is because the provision of dependable e-government systems would simplify the challenges of providing high-demand public services through the intern, a strong SQ has a positive effect on PEOU for E-government adoption. Based on discussions, the following hypothesis is developed:

**H<sub>2</sub>:** Citizen service quality has a significant influence on perceived ease of use.

### **2.2. The association between perceived usefulness & e-government acceptance**

The impact of PU on e-government is found significant[45]. This plays an important role in motivating people to seek public services using elec-government; The higher the PU, the more likely it will be to introduce e-government. People use e-government to connect with government officials and access public facilities because they think it will save them money and time. Increased implementation of eGovernment would be aided by a better definition of PU (Hung et al., 2013). According to Weerakkody, Kapoor, Balta, Irani, and Dwivedi (2017), the PU is in favor of the use of e-government by people. The following theory is developed based on the above discussion:

**H<sub>3</sub>:** There is a significant impact on the Perceived usefulness of E-government adoption.

### **2.3. The association between perceived ease of use & e-government acceptance**

PEOU has the main effect on e-government acceptance/Adoption[37]. People will be able to engage in e-government as PEOU progresses. While based on people's decision to use new technology, this is their first impression [46]. Citizens' e-government choices will increase as they find e-government easy to use[47]. Improving PEOU also allows people to use E-government to apply for the public, services. PEOU is improving e-government adoption, according to[48]. Based on the preceding statements, the below hypothesis is given below:

**H<sub>4</sub>:** there is the significant effect of Perceived ease of use on elec-government acceptance.

### **2.4. The Association between Trust & Perceived Ease of Use**

Customers' confidence in internet shopping and accessing the particular website grows as they assume the webpage they are viewing is straightforward to use (Koufaris & Hampton-Sosa, 2002). According to a study by[49], there is a substantial relationship between PEOU and Confidence, which influences purchasing intent. Likewise, Y. H. Chen and Barnes[50] stressed that PEOU is a major precursor to the creation of online trust and that this has a beneficial effect on purchasing intention. Roca, García, and De La Vega revealed that PEOU is a vitally important concern in online trading. Meanwhile, Roca et al.[51] clarified that PEOU is the primary antecedent of trust-mediated online trading services. Other studies suggest that PEOU impacts the formation of

customers' trust in e-commerce [52, 53]. Consumer trust is greatly affected by the ease of accessing and using a website. Kim, Lee ([54] found a favorable association between the functionality of navigation and the trust of electronic commerce. Research results by Bart, Shankar, Sultan, and Urban show that online sellers whose websites have easy-to-use features will quickly win confidence from their consumers. Another study demonstrates that ease of browsing, transaction engagement, lost ties, and navigation results in improvements in consumers' online trust. The association of PEOU and e-commerce trust is verified in different studies (Flavián, Guinalu, & Gurrea)[55], all of which found a favorable relationship. (Athapaththu and Kulathunga, 2018; Fitriyani, Sfenrianto, Wang, & Susanto; Hao, Hoa, & Dung.; Nunkoo & Ramkissoon; Phornpromsri & Chaipoopirutana.; Nunkoo & Ramkissoon; Phornpromsri & Chaipoopiru As a consequence, below hypothesis is suggested[56-59]:

**H<sub>5</sub>:** There is significant association among perceived ease of use & trust.

## 2.5. The association among e-government adoption and trust

Trust is an element that has been researched thoroughly and identified in several ways. According to Rotter (1971), confidence is described as "the belief that a person's or group's promise can be trusted." Trust is calculated on two levels in the e-government field: trust in the individual in question (in this case, the government) and trust in the technology that makes it possible (which, in this case, is the internet).

Trust in the department, according to Carter and Liu[60], has a major effect on technology adoption. Before endorsing e-government projects, people must have confidence that government organizations have the foresight and technical capabilities to introduce and safeguard those services. Communication with providers of e-government services that is genuine and anti-fraudulent will improve public confidence and acceptance of e-government services. On the other hand, unfulfilled promises and dishonesty from government officials and workers will erode confidence and raise resistance to such interventions. Jordan's government demonstrates a lack of cooperation between its agencies when it comes to writing laws and regulations relating to ICT use, system standardization, and knowledge exchange[13]. These issues could lead the Jordanian government to inefficiently deliver its information and services. Therefore, Jordanian people could be wary of the capacity of the government to adopt e-government programs with all the functionality that would satisfy their standards, such as fast and stable transaction procedures. As a result, this study looked at the impact of citizens' confidence in the government on their choice to use e-government services. According to previous studies, the role of government confidence in shaping e-government adoption is crucial. In, the authors [61, 27] analyzed the government confidence impact on e-government adoption and provided empirical evidence. We discovered that government confidence is a major determinant of e-government adoption. This is why e-government implementation is considered to be slowed by a lack of confidence in the government. However, in monarchy-ruled countries such as Jordan, research into the effects of government trust on e-government adoption is missing. As a consequence of the previous debate, the following hypothesis was proposed:

**H<sub>6</sub>:** There is significant relation between E-government acceptance & trust.

## 2.6. The mediating of perceived usefulness & perceived ease of use between service quality and e-government adoption

Two mediators influence behavioral intent to use technologies according to TAM [62]: PEOU and PU. The PU and PEOU mediate the effect of external variables on the intended application, according to Agarwal and Prasaad, Sánchez and Hueros, and Venkatesh [63-65]. Several experiments, on the other hand, show an important connection between the external variables in this study, self-efficacy, and the ability to use programs. Research by Jiang and Xu showed that happiness and PU have a direct effect on China's e-government intention to proceed[66]. Hu, Gray, Thong, Chan, and Tam compatibly consider PU as one of the primary predictors of continued usage of e-tax services in Hong Kong. Likewise, McCloskey discovered a substantial correlation between confidence and PU, suggesting that the more regard consumers have for the system, the higher their anticipation of its usefulness. Similarly, Pavlou found that PU's mediating impact on the association among trust and willingness to use online commerce continues, suggesting that PU's mediating effect on the relationship between trust and intention to use online commerce persists. Horst, Kuttschreuter, and Gutteling found that PU was the most significant factor in determining whether or not to use e-government services. Despite this, the analysis discovered that confidence was the most significant element in deciding PU. PEOU has been revealed to be strongly related to behavioral intent by scholars[65, 67]. The association between SQ and behavioral purpose has been discovered to be mediated by PU Benlian, Titah, & Hess. In contrast, a previous study found that PEOU has a minor mediation effect on SQ and behavioral intention (K. Al-Qeisi, Dennis, Alamanos, &



Jayawardhena and has no mediation association among SQ and behavioral intention (K. Al-Qeisi, Dennis, Alamanos, & Jayawardhena. (K. Al-Qeisi, Dennis, Alamanos, & Jayawardhena)[68]. This paper presents the mediation impact of the TAM key constructs among e-government acceptance and SQ in Jordan, reviewing relevant literature. Following are some theories for this thesis based on the aforementioned discussion:

**H<sub>7</sub>:** Perceived usefulness have a mediating effect on the relationship between citizen service quality & e-government adoption.

**H<sub>8</sub>:** Perceived ease of use has a mediating effect between the relationship of citizen service quality and e-government adoption.

### **2.7. The mediating of trust between perceived ease of use and e-government adoption**

In the previous parts of the research, the significance value of the trust has already been briefly addressed. Throughout previous parts, it was also clarified that the idea of expectations contributes to actions, and essentially intention was derived from the TRA and TPB. Depending on the assumptions many researchers have used various structures to improve the ability of these hypotheses to predict since several structures have been tested as mediators, for example, Wu, Liu, and Huang used perceived risk as mediators and found its results negatively on the intention of consumers to consider it, Park, Ahn, Thavisay, and Ren Used multi-dimensional potential benefits and reported that perceived benefits (except experiential benefits) had a beneficial effect on the mindset towards use, and PU was also investigated by other researchers as a mediator and found to have a favorable understanding of the intent to use them[69, 70]. In addition , the researchers have also studied trust as a mediator in several trials, and it is observed that trust has a beneficial impact on intention to use it (Park et al., 2019). The researchers, however, were involved in evaluating Perceived confidence as a mediator based on Ajzen 's expected behavior theory in the present case. Also; Mohammed Abdullah Al-Sharafi, Ruzaini Abdullah Arshah, Fadi AT Herzallah and Qasim Alajmi [71] showed the trust mediating effect in the TAM model. Several other studies have also indicated that a significant impact occurs between PEOU and Trust-mediated purchasing intention [72]. For the first time in Jordan, this paper has used and evaluated confidence as a mediator (to the best of the understanding of the researcher). In this analysis, researchers constructed on the sequence and series of TAM and TPB check mediators and used presumed trust as mediators, as specified by (Oliveira, Alhinho, Rita, and Dhillon[73]. Centered on both of these arguments, researchers came up with the below hypothesis:

**H<sub>9</sub>:** Trust has a mediating influence on the relationship between Perceived ease of use and e-government adoption.

### **2.8. The moderating of transparency between perceived usefulness, perceived ease of use and e-government adoption**

Association between PU and the introduction of elect-government would be reinforced by accountability. This is linked to the adoption of e-government, which is founded on effective connectivity between public institutions and individuals. Accessibility of community records and decision-making processes will assist people to reap the benefits of e-government adoption. With public records and processes accessible online, people may find elect-government more useful. Accessibility of public records will boost e-government. PEO's partnership with e-government implementation can be improved by accountability. People will easily apply for public services due to the availability of electronic records (Sabani, Deng & Thai)[74]. People with access to state data such as public service protocols and online contact information will find it easier to use e-government, which will encourage them to use it to get public services. PEO's impact on e-government adoption would be strengthened if democratic decision-making was more accountable by the elect-government. Based on the preceding debate, the following hypotheses have been developed:

**H<sub>10</sub>:** Transparency has a moderating impact on the association between perceived usefulness and e-government adoption.

**H<sub>11</sub>:** Transparency has a moderating impact on the association between Perceived ease of use and e-government adoption.

## **3. Theoretical framework**

TAM is a well-known paradigm that has been frequently used in technology adoption testing. It has been used and extended to numerous contexts by a significant number of scholars[75, 76]. The model has also been revised with the inclusion of new constructs. It has been used to determine the acceptability of various innovations in various environments. Where (Holden & Krsh, 2010; Legrs, Ingham, & Colerette, 2003; Maranguni & Grani,

2015; Teo, Fan, & Duadvocated for the inclusion of additional variables to TAM to enhance its predictive performance. Despite the veritable amount of research on TAM, new researches have continued to explore and enhance them [77]. Studies that assess the new technology acceptance in different contexts and groups are still called for and TAM can be extended to examine intention towards telecommunication services use as a new type of IT. Several experiments have expanded the TAM by incorporating different structures of PEOU and PU to help underscore the acceptance of innovations in real circumstances, to address the TAM's limitations in discovering the adoption of a given technology. Jon-Chao Hong, Ming-Yueh Hwang, Hsuan-Fang Hsu, Wan-Tzu Wong and Mei-Yung Chen [78], Apply TAM, for example, with the addition of interface design & presumed playfulness to investigate the introduction of Taiwan's national digital archive technologies from an individual perspective. Nripendra P Rana, Yogesh K Dwivedi, Michael D Williams and Vishanth Weerakkody [79], Include system performance, service efficiency, level of information, perceived risk, and perceived compliance with TAM systems to analyze e-government implementation in India from a citizen's perspective. Fitriani et al. [48] expand TAM by incorporating assumed behavior regulation, subjective standard, confidence, consistency of the program, and consistency of knowledge to consider the implementation of open government data in Indonesia from a citizens' perspective. Such experiments show TAM's potential to have a full picture of development adoption by integrating supplementary structures in varying conditions with PU and PEOU. Jordan is one of the Middle East's geographic pioneers in terms of national information technologies and online platforms. Jordan's e-government initiative differs from another Arabian experiment in that it is integrated at the state level across the whole Kingdom, with the task of establishing a national team devoted to e-government and enforcing it in government agencies (Alawneh, Al-Refai, & Batiha, 2013; Maalik, Shuoqin, Mastooi, Gul & Gul, 2016, Jordanian e-government is confronted with a low degree of e-services use. [80-85]. To address this gap, the present study aims to establish a model for the problem of low-level use of e-government resources through the incorporation of existing literature on information systems (IS) & the improvement of a new e-government adoption analysis model. After showed the justification to use this variable and the problems in Jordan, the researchers developed this model as exposed in figure 2.

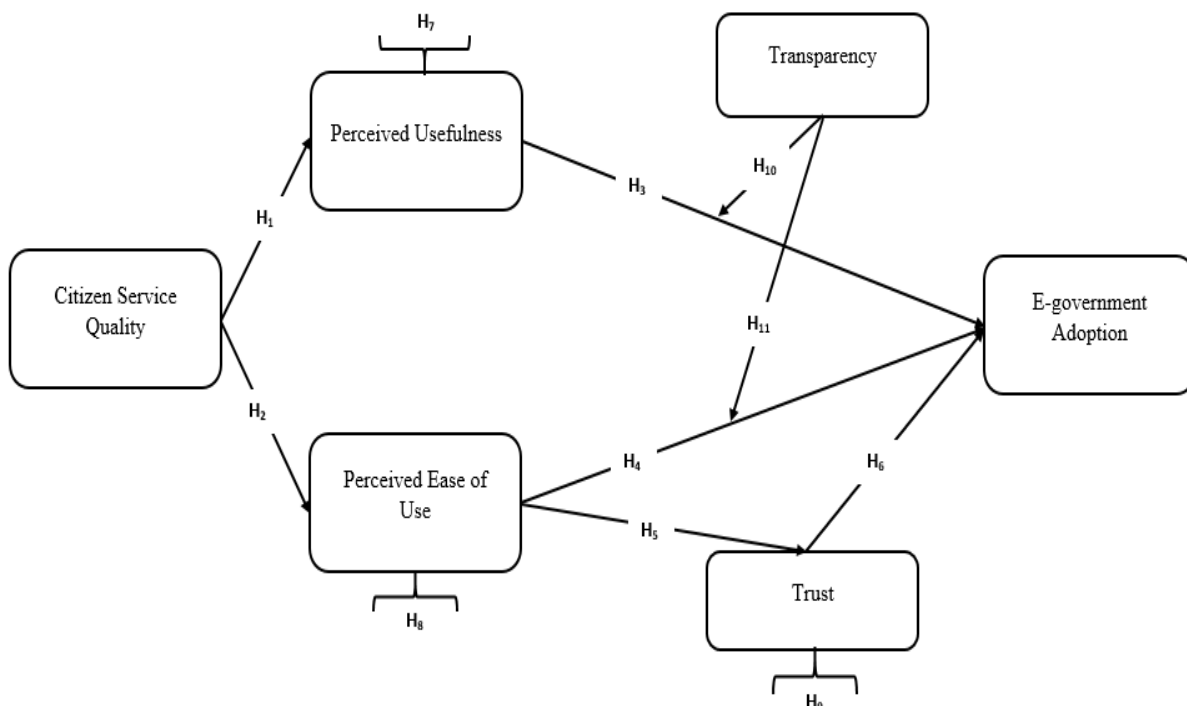


Figure 2. Theoretical framework

### 3.1. Development of instrument

A questionnaire survey was developed as a data collection method, as previously mentioned. As a result, the questionnaire components were intentionally structured to avoid repetition in terms of the dimensions defined in the test model's measurement frameworks. As Zikmund, Babin, Carr, and Griffin have suggested, as seen below, the questionnaire elements were included based on the analytical observations and descriptions examined in the literature that were implemented and modified to match the study's objectives.

Table 1. Measuring instruments

No.	Variable	No. of Items	Adapted
1	E-government Adoption	3	A Almukhlifi [86]
2	Perceived Usefulness	3	Qijun Xie, Wei Song, Xiaobao Peng and Muhammad Shabbir [87]
3	Perceived Ease of Use	3	
4	Citizen Service Quality	8	Mohammed Alonazi [88]
5	Transparency	8	A Almukhlifi [86]
6	Trust	4	Muhammad ZI Lallmahomed, Naguib Lallmahomed and Gias M Lallmahomed [89]

### 3.2. Data collection

Data is collected with the help of a questionnaire, as previously mentioned. As a result, the questionnaire components were intentionally structured to avoid repetition in terms of the dimensions defined in the test model's measurement frameworks. As Zikmund, Babin, Carr, and Griffin have suggested, Snowball sampling is implemented to meet prospective subjects between workers in Jordanian public universities, suitable because it is impossible to hit the target population. Since university workers are difficult to contact, and their knowledge is difficult to procure. The first component was evaluated using Structural Equation by Multivariate Analysis System Modelling (SEM) using analysis of moment structures (AMOS) software v. 22.0. The second component was evaluated using Structural Equation by Multivariate Analysis Method Modelling (SEM) using analysis of moment structures (AMOS) software v. 22.0. AMOS was selected because of its technological complexity [90]. Furthermore, it makes a more accurate measure of an instrument's discriminant validity than an exploratory study (Bagozzi & Phillips, 1982). The second part, on the other hand, was analyzed using the Statistical Kit for the Social Sciences (SPSS) 22.0. In addition, the questionnaire for this analysis uses a ten-point rating scale ranging from one to ten, with one being "strongly disagrees" and ten being "strongly agrees." According to Awang [91], the acceptable range of a questionnaire should be between 1 and 10. The author believes that the interval scale is a continuous score and that parametric statistical analysis is needed. The 10 point ranking system is used in SEM before.

### 3.3. Respondents demographics profile

The demographic characteristics of 423 respondents in this sample are broken down into five groups: class, age, marital status, experience, schooling, and income. Male respondents outnumber female respondents 61.2 percent to 38.8%, implying that male respondents outclass female respondents. 126 of the respondents are married, while 213 are unmarried. In terms of age groups, 24 respondents are under the age of 23, 106 are between the ages of 23 and 33, and 169 are between the ages of 33 and 69. Just 2.6% use e-government services for one year for the training, while the rest use e-government services for 6-10 years for 43.7 percent and 22.0 percent use e-government services for 11-16 years and more information in table 2.

Table 2. Demographic information of respondents

No.	Construct	Frequency	Percent
1	Gender		
	Male	259	61.2
	Female	164	38.8
2	Age		
	18 to less than 23	24	5.7
	23 to less than 28	30	7.1
	28 to less than 33	94	22.2
	33 to less than 38	106	25.0
	38 or more	169	40.0
3	Status		
	Single	213	50.4
	Married	126	29.8

No.	Construct	Frequency	Percent
4	Divorce	68	16.1
	widow/widower	16	3.8
	Experience		
	less than 1	11	2.6
	1 to less than 6	37	8.7
	6 to less than 11	185	43.7
	11 to less than 16	93	22.0
	16 to less than 21	33	7.8
	21 to less than 26	26	6.1
4	26 to less than 30	30	7.1
	30 or more	8	1.9
	Academic		
	high secondary school	7	1.7
	Bachelor	12	2.8
	Diploma	98	23.2
5	Master	94	22.2
	PhD	212	50.1
	Salary		
	\$250 to less than \$500	7	1.7
	\$500 to less than \$1000	32	7.6
	\$1000 to less than \$1500	88	20.8
	\$1500 to less than \$2000	126	29.7
	\$2000 or more	170	40.2

### 3.4. Confirmatory factor analysis

The CFA was used to improve the overall model fit by fine-tuning the factor structure ( Figure 4) that emerged from the Exploratory Factor Analysis (Moslehpour, Pham, Wong, and Bilgeli)[92]. Many of the recommended parameters for suitable compatibility have been met, meaning that the proposed model and the observational evidence in this analysis are a reasonable match.

The factor loadings of two items (SC1, SC2) were below the cut-off when the uniform loadings of the model's items were assessed. As a result, as seen in figure 3, these elements were separated from their respective constructs.

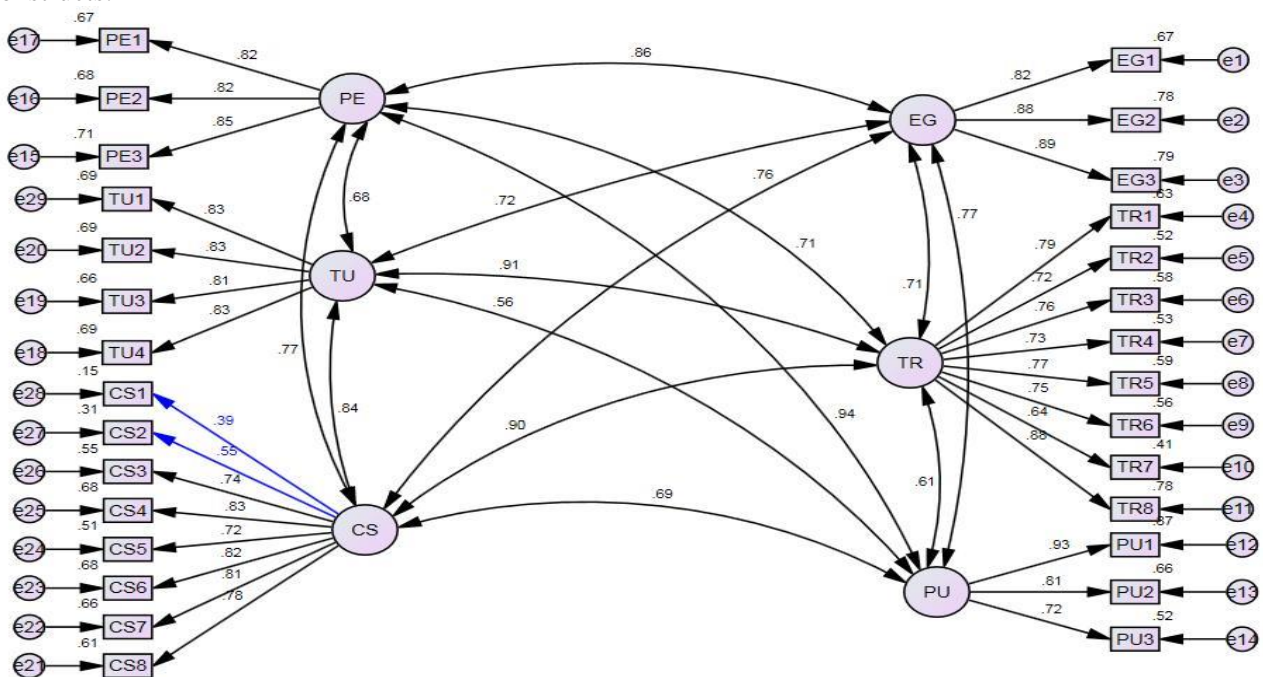


Figure 3. The measurement model with 29 items



Use AMOS 22 all variables are used in the proposed model as exogenous variables in this process. In EFA, we are exploring factor structure while in CFA, we validate the factor structure that we derived from EFA to boost the model's overall fit. The findings of the CFA show the Chi-square / Degrees of Liberty ( $\chi^2 / df$ ) = 4.695. GFI (fit-index goodness) = 0.686. The results are consistent with the model fit criteria suggested by (Bentler and Bonett, 1980) and others. TLI = 0.755 Tucker-Lewis coefficient. The TLI value is similar to 1, meaning that the fit is excellent (Bentler & Bonett)[93]. MacCallum, Browne, and Sugawara say that if the root means square error approximation (RMSEA) is less than 0.08, the fit is satisfactory. In this article, the RMSEA is 0.034[94]. All of the models fit indices in this analysis point to a strong match for the structural model.

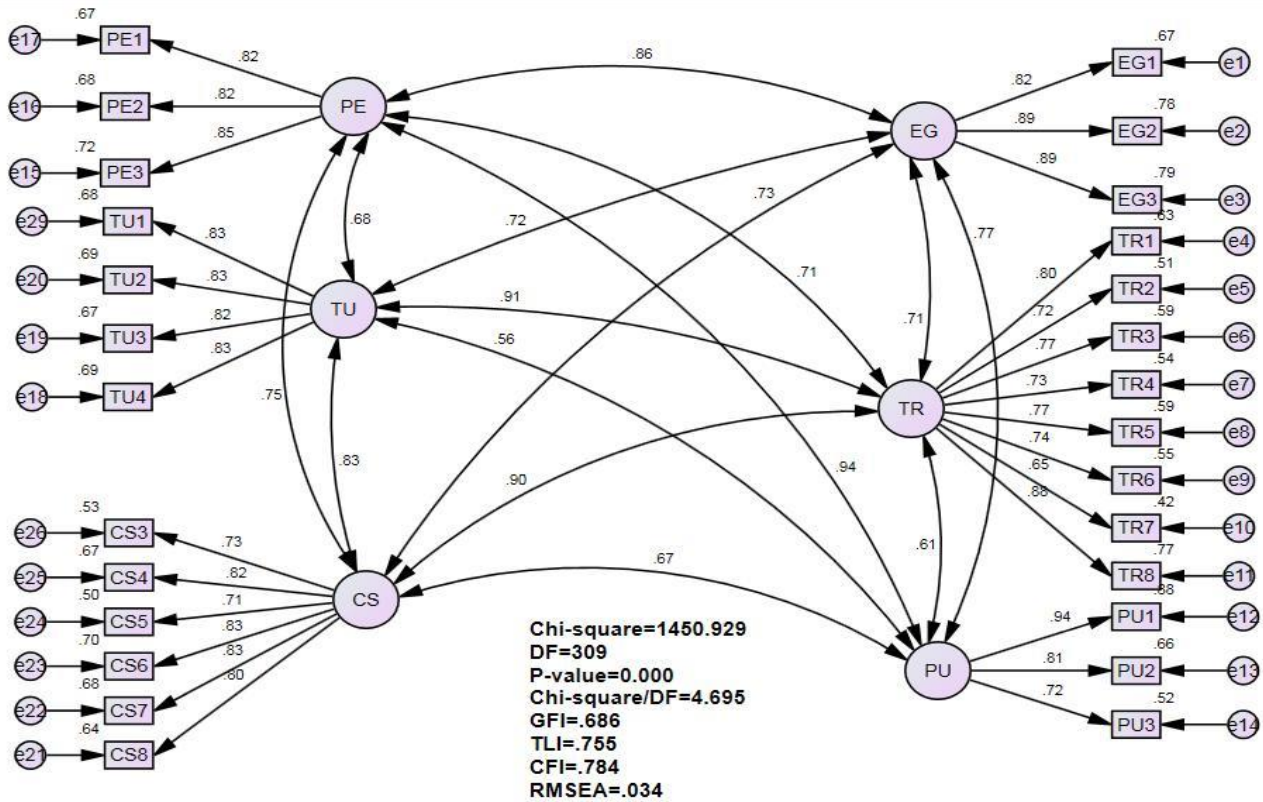


Figure 4: The final pooled confirmatory factor analysis measurement model

### 3.5. Composite reliability, convergent and discriminant validity

For each construct, composite and cumulative average variance were used to assess the reliability and convergent validity. Fornell and Larcker found that all of the AVE values are greater than or equal to 0.50, indicating convergent validity[95]. The Cronbach alpha values (Table 3) for both of the models are greater than 0.7, indicating that the calculations used in this study are accurate. Internal precision among research instruments is generally calculated using Cronbach's alpha coefficient. Above the minimum point of 0.7, as determined by composite reliability estimates (Table 3)[96].

Table 3. Validity and reliability

	Cronbach's alpha	AVE	CR
EG1	0.818	0.748	0.899
EG2	0.885		
EG3	0.89		
TR1	0.795	0.575	0.915
TR2	0.717		
TR3	0.768		
TR4	0.733		
TR5	0.765		
TR6	0.744		
TR7	0.645		

	Cronbach's alpha	AVE	CR
TR8	0.878		
PU1	0.936	0.705	0.904
PU2	0.809		
PU3	0.72		
PEOU3	0.846	0.688	0.869
PEOU 2	0.823		
PEOU 1	0.819		
TU4	0.829	0.682	0.896
TU3	0.816		
TU2	0.832		
TU1	0.827		
CS8	0.798	0.629	0.922
CS7	0.826		
CS6	0.834		
CS5	0.707		
CS4	0.818		
CS3	0.731		

Per AVE statistic exceeds the average mutual variance, as seen in Table 4. (squared correlations). To fully satisfy the criterion for discriminant validity, Fornell and Larcker claim that the AVE estimates of the two systems must be greater than the inverse variance estimate (square correlations) (1981). All of the criteria for discriminant validity were met in this report.

Table 4. Discriminant validity

	EG	TR	PU	PE	TU	CS
EG	<b>0.86</b>					
TR	0.71	<b>0.75</b>				
PU	0.69	0.73	<b>0.83</b>			
PE	0.67	0.54	0.65	<b>0.82</b>		
TU	0.50	0.60	0.48	0.74	<b>0.82</b>	
CS	0.77	0.59	0.66	0.69	0.63	<b>0.78</b>

Overall, the observations of all metrics offer ample evidence to confirm the data set's reliability and validity.

### 3.5.1. Structural model

The researcher will conclude that the estimation models have been validated for all latent structures involved in the procedure until the CFA analysis is done and all values exceed the required validity and reliability requirements. The next step is then to map the structures into the formal form to incorporate Structural Equation Modelling (SEM). The constraints were organized from left to right, with the independent variables on the far left, the mediator construct in the center, and the endogenous construct on the far right[90, 97]. The researcher then uses the single-headed arrow to connect the exogenous construct to its respective endogenous construct depending on the hypothesis path. Finally, the double-headed arrow is used to link all exogenous constructs. The AMOS outputs the association between an independent variable, standard factor loading, and R2 for each component, the standardized regression coefficient relating each independent variable; citizen service quality to the mediators; PU and PEOU even with the dependent variable e-government adoption in the standardized model, as seen in figure 5.

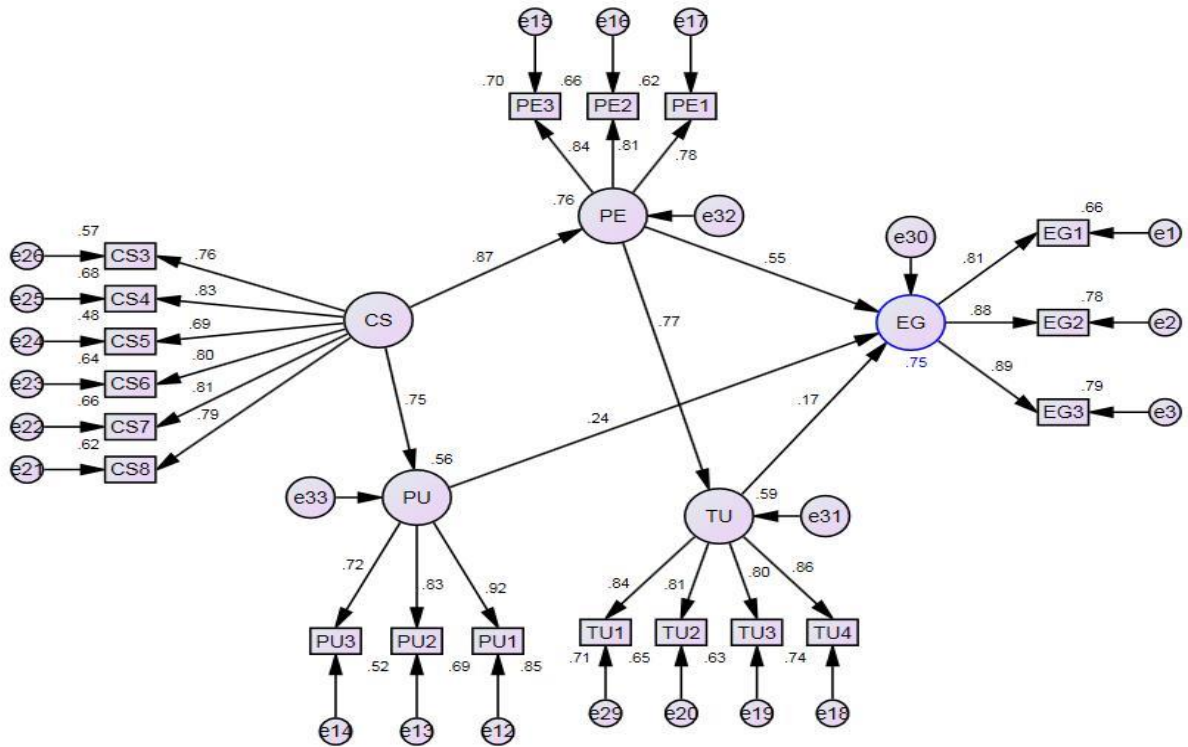


Figure 5. The standardized regression path coefficients between constructs in the study

The description of the acceptance of the model's R2 (multiple determination coefficient) by e-government (as derived from Figure 4) is clarified in Table 5.

Table 5. R2, or the coefficient of multiple determination, and its significance in this research

Endogenous Construct	R2	Conclusion
E-Government Adoption	0.75	The citizen service quality, PU, PEOU, and trust management explain about 75 percent of the e-government adoption.

### 3.5.2. Testing direct effect hypothesis

The hypotheses testing results for the regression coefficient are tabulated in Table 6.

Table 6. The Regression coefficient and its significance

		Estimate	S.E.	C.R.	P-value	Result
PE	<-- CS	.692	.045	15.404	***	Significant
PU	<-- CS	.550	.047	11.783	***	Significant
TU	<-- PE	.685	.048	14.352	***	Significant
EG	<-- PU	.256	.056	4.567	***	Significant
EG	<-- PE	.553	.079	7.033	***	Significant
EG	<-- TU	.193	.070	2.756	.006	Not Significant

The findings indicate that service efficiency has a substantial positive impact on PU (H1), which is followed by [39, 37, 44]. This means that people will be able to access elec-government services as public university services are provided by e-government. The report concludes that delivering high-quality e-government services would

mitigate the problems applying for government services online. This paper shows PU, & PEOU, have a substantial positive impact on e-government adoption (H3, and H4), which is in line with previous studies by Weerakkody, Kapoor, et al. (2017) and Fitriani et al (2017). That indicates that e-government adoption will be increased if people consider e-government to be friendly to use and more efficient. Residents will support the adoption of e-government to register for public university education, but it is difficult to use. The better the advantages e-government offers, the more likely it would be for people to use e-government to access public services. PEOU has a major positive impact on trust in the implementation of e-government in Public universities, according to the report. (H5). In the same way found positive between them in the previous studies [98, 99, 59, 56, 57]. Furthermore, confidence has no impact on the adoption of e-government in Jordanian public universities, according to this report (H6). The study's result varies from current literature, including Alomari et al analysis 's results (2012). This study indicates that there is no connection between the confidence in using the internet and PEOU among Jordanian people. Such a finding may be attributed to the fact that around 40.0 percent of the sample participants are over 38 years old.

### 3.5.3. Testing for mediation effect hypothesis

Mediation analysis was conducted to recognize the type of mediation that exists in the model [100]. Out of eleven hypotheses, there were three hypothesis testing proposed that firstly, PU mediates the association between citizen service quality and e-government adoption. PEOU is said to mediate the interaction between citizen service competence and e-government acceptance, according to the other mediation partnerships. In addition, the association between PEOU and e-government adoption is mediated by confidence. The hypothesis checking for mediation effects of a mediator construct in the model and the process in SEM to evaluate these hypotheses was performed independently, specifically. The researcher used the approach suggested by [91] to check the mediation effects in the model. The measuring mediator technique is performed in Figures 5, 6, and 7.

### 3.5.4. Hypothesis 7

This paper proposed that PU has a positive mediating influence on the citizen service quality- e-government adoption relationship. The results showed the direct effect to be 0.314, with the indirect effect being 0.164. Additionally, upper and lower bound are in a positive region, which indicates significant partial mediation, which shows support for the hypothesis. PU in the e-government service has been shown to have a substantial association with service efficiency and behavioral purpose in previous research. V. Venkatsh (2000), Agarwal and Prasad (1999), Sánchez and Huers (2010), and Benlian et al (2012). Stronger SQ would boost Jordanians' perception of the benefits of e-government adoption, according to the findings of this report. People's expectations of e-government delivery are more likely to be met if the quality of public services provided online is adequate. Since public service accountability, accessibility, and confidence lead to increased PU in e-government adoption, SQ is a major catalyst for e-government adoption. This result indicates that, to enable Jordanians to participate in e-government, Jordanian government universities should maintain the accessibility of high-quality government services through e-government.

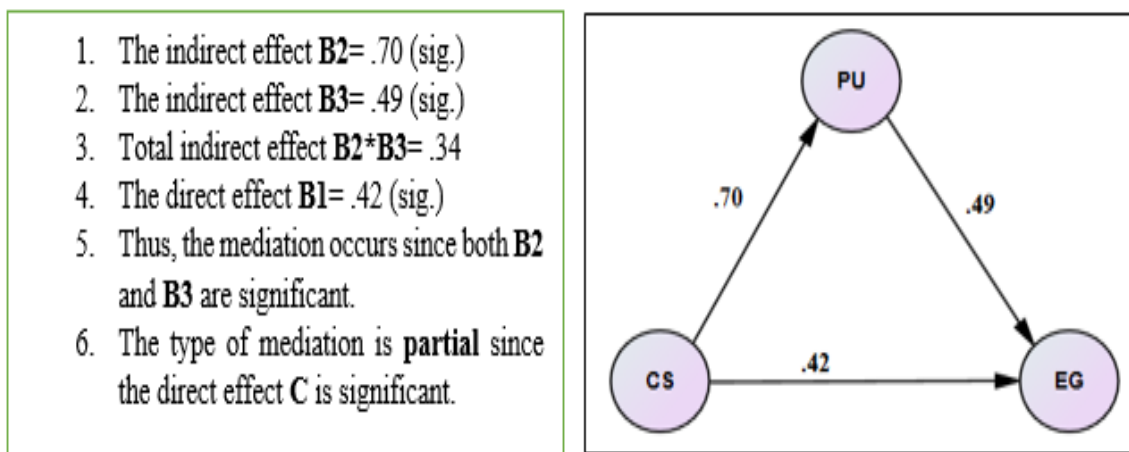


Figure 6. The mediation testing procedure for CS – PU – EG

### 3.5.5. Hypothesis 8

The positive mediating role of PEOU on the citizen service quality- e-government adoption relationship was examined in the current study. The results indicated that PEOU of employees mediates the citizen service quality- e-government adoption relationship among lecturers working in public universities in Jordan. The results showed the direct effect to be 0.276, with the indirect effect being 0.186. Additionally, both upper and lower bound are in a positive region, which indicates significant partial mediation, which shows support for the hypothesis. Moreover, empirical studies have revealed PEOU can strengthen as mediate in e-government service Ritu Agarwal and Jayesh Prasad [101], R Arteaga Sánchez and A Duarte Hueros [102], and Viswanath Venkatesh [103], Kholoud Al-Qeisi, Charles Dennis, Eleftherios Alamanos and Chanaka Jayawardhena [104]. The results of the research indicate that e-government use will be simple for Jordanian residents who are accessing high-quality public services online. People may voluntarily overcome difficulties they can pose when applying for public services by e-government when high-quality public services are provided online. -The outcome of the partnership between SQ and PEOU suggests that the sense of ease of use would be improved by confidence in the public services offered online such as maintaining privacy and security. Efficient public services through e-government are important in helping Jordanian people expend less energy on demanding public services through e-government.

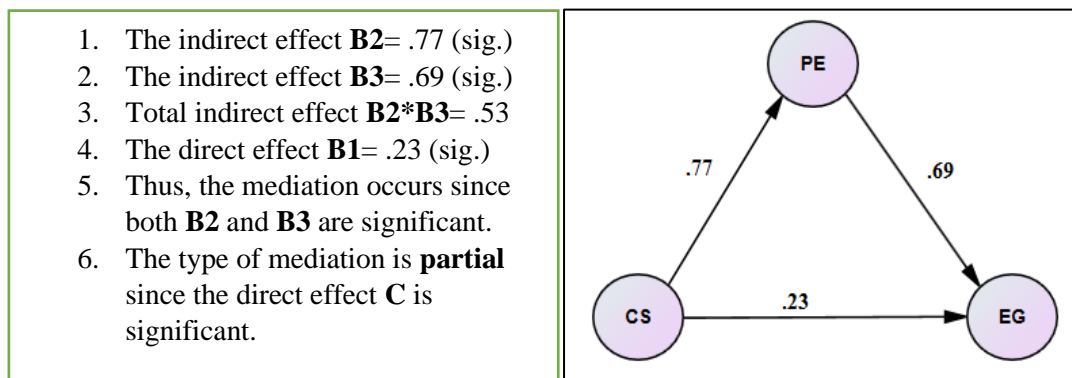


Figure 7. The mediation testing procedure for CS – PE – EG

### 3.5.6. Hypothesis 9

This study looked into the importance of confidence in mediating the connection between PEOU and e-government adoption. Employee trust is, in general, a significant determinant of e-government adoption. The direct effect was found to be 0.253, while the indirect effect was found to be 0.211. Furthermore, both the upper and lower limits are in a positive category, suggesting substantial partial mediation and endorsing the hypothesis. Finally, respondents concluded, to a lesser degree, that the standard of e-government facilities has an indirect impact on citizen trust. This is because certain considerations, such as security and privacy, are perceived to have a more significant impact on the interest of the people. Even though the efficiency of the e-government service was good, the participants said they would not use it because they did not trust making any financial transactions online. People would have confidence in the government's ability to implement and manage these systems, both administratively and technologically.

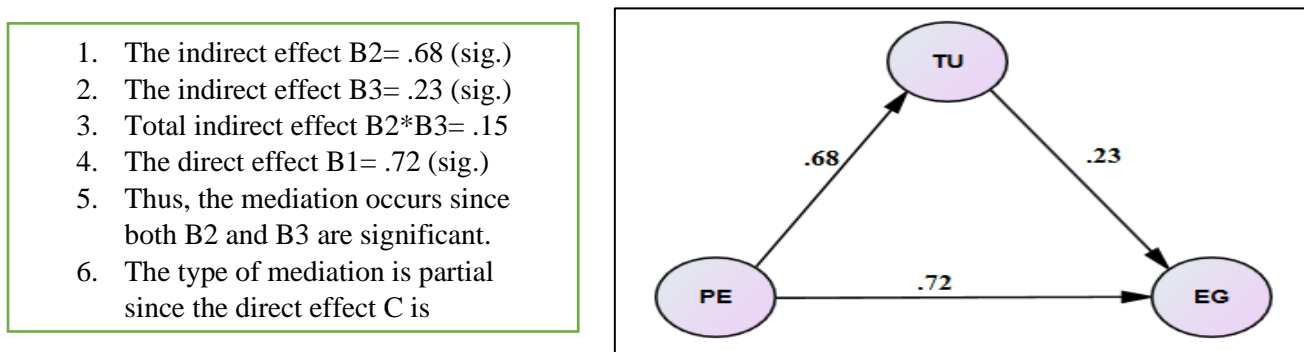


Figure 8. The mediation testing procedure for PE – TU – EG



**Testing for Moderation Effect Hypothesis**

hypothesis 10, and 11 of the study were tested to study the moderating role of transparency on the relationship of PU, PEOU & e-government adoption. The p-value 0.197 for the moderating (interaction) effect was found to be not significant. Hence the moderating impact of transparency on the association of PU and e-government adoption was found to be not supported (**H10**). Also; the p-value 0.000 for the moderating (interaction) effect was found to be significant. Hence the moderating effect of transparency on the association of PEOU and e-government acceptance was found to be supported (**H11**). And this result confirms with [74, 105, 106]. The table and figure for the moderated model is shown in the following.

Table 7. The Test of hypothesis of moderator

	Estimate	S.E.	C.R.	P
EG <--- PU	-.362	.281	-1.289	.197
EG <--- PE	1.080	.302	3.579	***
EG <--- TR	.163	.080	2.045	.004

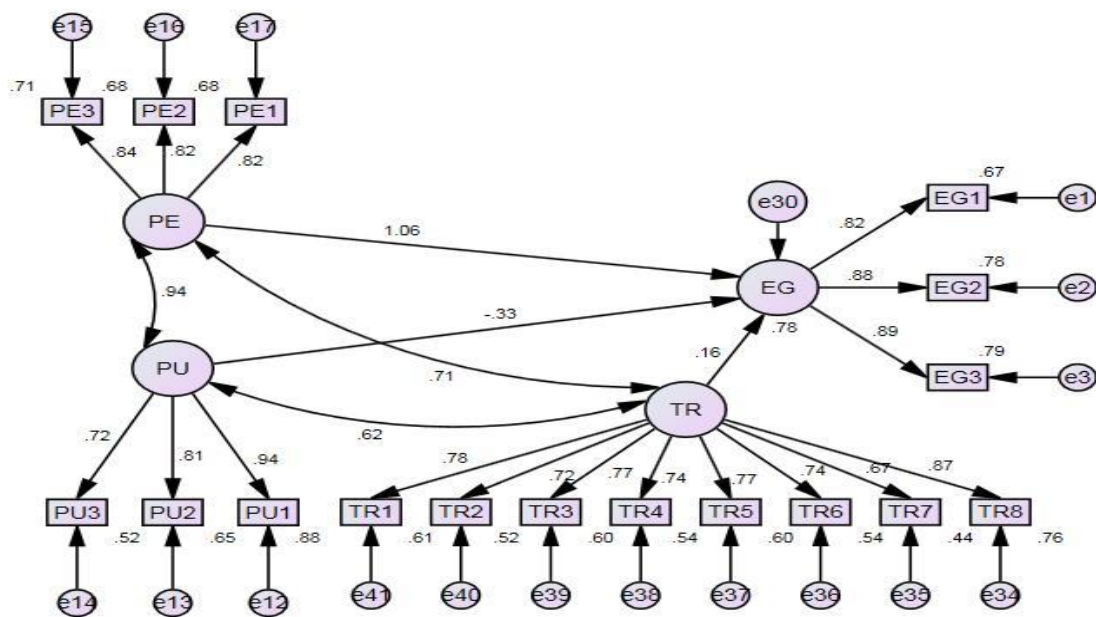


Figure 9. Model showing moderation of transparency

This research shows that accountability is adversely moderating the association between the PU and e-government adoption in Jordan. When Jordanian public universities post agendas, budgets and expenditures, and personnel contact information online, people may better use those information to access public services in a fast, easy, and efficient manner through the implementation of e-government. Such a finding indicates that Jordanian public universities should ensure the openness of public decision-making to boost e-government acceptance of the PU. Citizens will use e-Government by improving public service connectivity to e-Government. The findings reveal that when Jordanians perceive the transparency of public university decision-making, PU has a negative impact on e-government adoption. If transparency is lacking, PU's influence on e-government adoption in Jordan will dwindle slightly. This study shows that openness regulates the interaction between PEOU and e-government acceptance in Jordan in a positive way. It implies accountability would improve the positive partnership among PEOU and the implementation of e-government. As accountability is growing, PEOU's partnership with e-government adoption is deeper. The provision of public electronic information makes people properly understand how convenient it is to use e-government for community services. i.e., having online contact information enables Jordanians to engage with elected authorities regarding problems pertaining to e-government-delivered public services. Citizens would be able to use public services more easily as a result of this. PEOU has a greater positive influence on e-government acceptance, according to the results, because Jordanians consider democratic decision-making in public universities as open.

#### 4. Research contributions

This study advances the field of e-government science and has practical implications for Jordan's e-government growth. This essay adds to the e-government literature from a theoretical standpoint by (A) developing and evaluating an analytical framework to analyze the important variables for e-government adoption; (b) using TAM to study e-government adoption in a specific environment, and (c) investigating the effect of human factors on e-government adoption in Jordan from the perspective of residents. By introducing a new approach to rising e-government acceptance, this study adds to the current e-government literature. From the viewpoint of Jordanian university workers, the study demonstrates how human factors such as transparency and trust can contribute to a deeper understanding of e-government adoption. This research expands TAM to better explain e-government adoption by exploring the role that individual factors play in increasing e-government adoption. The latest e-government models focused on TAM rely mainly on the conditions associated with the characteristics of the persons. This research expands TAM by exploring the impact of openness and trust as external influences on e-government adoption from a citizens' viewpoint. This study uses observational evidence to see how the extended framework, in the context of developing countries, can be used to analyze the introduction of e-government. From a realistic viewpoint, this paper presents useful research results to boost the implementation of public services for various e-government users in Jordan including public universities, e-government designers, and developers. The results of this paper will help public Jordanian universities develop their array of novel tactics and recommendations for the effective implementation of e-government initiatives.

#### 5. Conclusion

Although there are several significant studies in the e-government study literature, the bulk of these studies concentrate on e-government rollout rather than citizens' continuing use of e-government beyond the initial stage of adoption. As a result, the report makes an important impact in that it provides for a deeper comprehension of citizens' views on e-government systems in a developed world. It reveals how varying the topic of citizens' trust in developed countries is. Adding a new element of e-government analysis further gives insights into how people involved in e-government systems are open by analyzing their actions in achieving web infrastructure sustainability. It is important for administrators and the government to consider citizens' perspectives on the e-government facility. As a result, the results of this study have paved the way for Jordan's government and civil service sectors to prepare and improve their e-government services strategies. These insights can be successfully used by government policymakers, planners, administrators, and promoters to raise public understanding of E-government services. Further, the government agencies should focus and support the use of promotion tools to reflect the usefulness, the easier, faster, and safe method to complete government transactions over the internet by using social media. As a result, potential research may concentrate on other e-government services offered to private businesses or e-government services provided by the state.

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