

Antecedents of user attitude toward e-government services use: Empirical study on department of lands and survey

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ABSTRACT

This qualitative study examined the impact of social media characteristics on the attitude of users toward the use of e-services by the Department of Lands and Survey. The study population comprised users of Department of Lands and Survey e-service, while the study sample comprised 407 users. Data from respondents were analyzed using SEM run using Amos (23). Results showed reliability, security, website design, ease of use, awareness, and digital divide as direct significant antecedents of user attitude toward the use of e-services from the Department of Lands and Survey. Also, all antecedents showed direct significant relationships with user attitude. Results showed a direct significant relationship between user attitude and the use of e-services from the Department of Lands and Survey. Through mediation of user attitude, five indirect significant relationships between the antecedents and the use of e-services from the Department of Lands and Survey were found. The inclusion of new antecedents such as privacy and site content may enhance the understanding of how users use e-services provided by the Department of Lands and Survey.

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1. Introduction

Information and communication technologies (ICTs) are now an integral part of nearly all aspects of human life. During the pandemic of COVID-19 which began in 2019, the significance of ICTs was amplified even more, as citizens around the world were forced into lockdowns and social distancing; the use of ICTs has allowed communication to occur even when the involved parties were far away from each other. ICTs have been proven vital for global development, involving various parties such as organizations, economic blocs, as well as countries, as highlighted by the European Commission (2010) and World Bank Group (2016). eGovernment (eGov) is an example of a tool that operates on ICTs. eGovernment is now becoming more prevalent in all categories of countries (i.e., developed and developing). At both local and national levels, eGov increases the effectiveness of public delivery through increased transparency, accountability, and civic engagement. It also makes government services more accessible and more responsive to the needs of people, leading to improved citizen-government relationships while also nurturing a more inclusive society (Feeney & Brown, 2017). eGov increases citizen-government interaction, especially at a local level, particularly the participation of citizens in the decision-making process consultation, as indicated by Naranjo-Zolotov et al. (2019). However, the success and benefits of eGov can only materialize with ICT access, at individual, firm, or community level, in both developed and developing countries. For stakeholders and governments (both central and local), particularly those with the interest towards promoting eGov and civic involvement, asymmetries in ICT access and

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use have been a major issue. These asymmetries have been preventing the citizens from fully taking advantage of the system. In fact, as reported by the UN (2010), there were still disparities in the development of eGov across countries, regions and cities, and each case of disparity was characteristic specific. Since the past decade, the Internet has become an important method to communicate among people. In the private sector, the use of technology has been beneficial, and this has compelled the public sector to follow suit. Tola (2020) accordingly articulated the need of the public sector in utilizing the most recent technology and the internet in its electronic services delivery. Notably, the Information Communications Technology (ICT) has been consistently progressing, and for this reason, government electronic services (e-services) have been increasingly under scrutiny since the past several years. The delivery of government e-services is primarily made possible by the Internet, and as reported by AlHawary and Al-Menhaly (2016), the government has considerably shifted from delivering its services face-to-face to delivering them using electronic means (e-services). Meanwhile, citizens are increasingly demanding public services of better quality and government operations with increased transparency; the same can also be observed among civil society, and other development associates. In meeting these demands, governments have begun integrating fitting technologies associated with information and communication into public administration systems.

E-government includes ICT usage by government, in the effort of enhancing public services. Such move has made citizen-governments relationship stronger while also increasing citizen participation in government's decision making (Mensah et al., 2020). It has been reported that in a week, people on average would be on social networking sites for at least four and a half hours in total, and this time duration exceeds the amount of time they would spend on e-mail. Clearly, social media networking has become important to the life of the people; it allows people to do many things such as expressing themselves or checking out the views of others. As aptly proposed by Arora and Agarwal (2019), social media sites can affect purchase intention of customers. Since the past decade, the significance of social media as the major source of data has been observed among various bodies such as non-profit organizations, government agencies, businesses, academia, and the people at large. For government agencies, Yigitcanlar et al. (2020) found that the use of social media analytics has greatly facilitated the task of gathering public opinion on new themes and extracting important messages.

The use of Facebook through smart mobile devices is on the rise, and as a result, new experiences, interactions, and market behaviors have emerged. Rajesh et al. (2019) accordingly indicated that through mobile technologies, customers are able to share information and get connected with brands in a new way. For businesses, mobile technologies allow them to reach, notify, involve, sell to, study, and provide support to their customers in a novel way. Within the past three decades, major transformations have been observed in some services provided by the public sector. Today, with the internet, new services and applications could be executed in an innovative manner, that is, through electronic medium. Many government agencies have begun to provide e-services, primarily to provide information, increase efficiency and decrease cost (Alabdallat, 2020). In Jordan, the Department of Lands and Survey provides various e-services to the citizens, and in fact, most of the services provided by the Department of Lands and Survey are provided using electronic media. In Jordan, the Department of Lands and Survey is the first national institution that provides all its services to the citizens electronically, specifically since March 2021. Among the e-services provided include (among others): professional license renewal, electronic payment of traffic defiance, and electronic tax payment of building and roofing. Users could also make requests electronically for lighting maintenance or replacement, container placement, tree pruning, vector control service and building consultation (dls.gov.jo, 2024). Additionally, the user can also lodge a complaint electronically. This study examined the effect of characteristics of social media on the attitude of user towards the use of electronic services provided by the Department of Lands and Survey. There were 112 e-services being provided by the Department of Lands and Survey on its website (dls.gov.jo, 2024). These services could be accessed by the user and the user also could create their own account. The use of traditional methods could not provide users with such services (Al-Hawary & Al-Menhaly, 2016). The global outbreak of COVID-19 in 2020 has dramatically altered life affairs of people – the imposition of lockdowns and social distancing has prevented the citizens all over the world, including the citizens of Jordan, from accessing services in a conventional manner (face-to-face). As one of the solutions, users turned to websites to obtain services that they could otherwise obtain face to face before the pandemic hit. According to Abdeljawad et al. (2021), websites had benefited users during the pandemic. The impact of reliability, web design, security, ease of use and awareness on the attitudes of users toward the use of Department of Lands and Survey e-government services should therefore be examined comprehensively, in addition the impact of digital divide on e-government services should be examined as well. The objectives that this study attempted to achieve were as follows:

1. To examine the impact of Reliability, Security, Website design, Ease of use, Awareness, and digital divide on the use of e-government services made available by the Department of Lands and Survey.
2. To determine the impact of Reliability, Security, Website design, Ease of use and Awareness on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.
3. To determine the impact of the attitude of users on the use of e-government services made available by the Department of Lands and Survey.
4. To identify the impact of digital divide on e-government services made available by the Department of Lands and Survey.
5. To examine the mediation effect of the attitude of users on the use of e-government services made available by the Department of Lands and Survey.

2. Literature review and hypothesis development

Today, the Internet and information technology is being used expansively. Many business transactions are now executed virtually, rather than physically as in the past. At present, online customers have increased in number, and this has resulted in a concern towards the reliability of online transactions. The reliability of internet transactions affects customer expectations regarding the actual ability of the internet websites to deliver as promised. Reliability has been examined in studies, pertaining to its effect on the use of e-services (Nasidi et al., 2021). Reliability can be defined as a commitment towards providing services that are reliable, accurate, and timely to users, and the factor of reliability has a direct effect on customer pleasure. Ali (2019) added that reliability is a strong indicator of consumer happiness towards e-services, after the factor of quality.

In their study, Pleger et al. (2020) discovered the preference of respondents towards digital public services to traditional public ones. Additionally, user evaluation on public services is strongly affected by data security/protection as well as pricing. The factor of data security and protection is especially crucial in e-services involving private information of users, for instance, in e-services on tax statements. Ali (2019), in examining the website design effect on the use of e-services, mentioned that the design of the website represents the interest provided by the user interface to customers. Customer satisfaction and evaluations of quality are determined by design aspects. In this context, website design can be understood as the degree of practicality, access, ease of use, comfort, and beauty presented to the customer, and all of these factors represent system quality. Appositely, interactivity means website user's capability in interacting with the process through elements such as feedback and different response methods (Izquierdo-Yusta et al., 2021).

As demonstrated by various scholars, ease of use affects e-services utilization. In the measurement of e-services among customers, the high impact of the factor of ease of use has been reported. Ease of use can be understood as the presence of a friendly interface or environment between customer or citizens and government via a website that is not only friendly but accessible as well (Al Balushi & Ali, 2016). The term 'accessible' in this context means that the website can be accessed by anybody irrespective of location. Relevantly, the impact of awareness of e-services usage was reported by Fakhoury and Auber (2017). Additionally, acceptance and continuing use can result from increased awareness of e-services through social media, and the notion of awareness, according to Dahi et al. (2015), encompasses an understanding of the actions executed by other people that impart a perspective to a person. In this regard, a person will show readiness to embrace change – in this context, using services electronically from using them traditionally – providing that the forthcoming advantages are clarified and the occurrence of the transition is perceived as likely.

Reliability is manifested in measurement constancy. For instance, an instrument is perceived to demonstrate reliability if it brings similar results when used by the same user each time. Notably, it is not likely that a measurement is fully reliable. Hence, several metrics may be employed in evaluating reliability. For instance, equivalence can be ascertained using inter-rater reliability. Using this test, the qualitative agreement level between two or more observers can be ascertained. Inter-rater reliability can be exemplified through the scores given by judges during a skating competition. In this situation, inter-rater reliability can be described as the consistency level of the ratings of all the judges to the skating participants. Inter-rater reliability of an instrument has linkage to their unswerving scores (Heale & Twycross, 2015).

Security can be understood as safety. It can also be understood as the measures that are taken in order to be safe or protected. For instance, the provision of security guards at banks will make the bank customer feel safe. Equally, a teddy bear in bed may make a small child feel secure sleeping alone.

Usability and accessibility of web design can be evaluated using several methods, some of which are for understanding the user, while other methods are used to find issues with the design. Thus far, there is no perfect method; each has its own strengths and weaknesses, and so, designers have to determine the one that fits their goals. In choosing the right evaluation method, designers need to first ascertain the website character as well as the design process stage. Considering the human factors; the design process needs to be iterative, and so, the outcomes from various usability evaluations will guide the improvements. In this regard, the use of multi method approach in web usability evaluation will result in combined findings for different related design issues while also generating some unique insights into other major factors with potential impact on user trust and website usage (Vu et al., 2021).

The factor of ease of use is the ease level that concerns system usage. A technology that consumers find simple to use is a beneficial technology, and such technology will increase the inclination of customers towards using it. User-friendly apps are those with ease of use. Malik et al. (2017) indicated that an app with ease of use will make users feel good, consequently resulting in satisfaction. In this regard, usage of social media and electric applications will be higher if users find them less difficult and less taxing to use. Tandon et al. (2016) mentioned that ease of use is essentially about how easy a technology or system is for users to understand, become skilled at, and employ, without having to make many efforts mentally or physically. Awareness relates to the insides of consciousness created by sensory stimuli absorbed by the brain. As indicated by Bayne et al. (2019), these contents result in behaviors, and this phenomenon shows that consciousness is a property of a living organism. Social media allows people to learn, increase awareness, share knowledge, and be always connected to the outside world (Saud et al., 2020).

ICT infrastructure (e.g., Internet access) has positive relation with eGov development (International Telecommunication Union, 2018a, b). The access and skills of the internet seem to be pre-conditions for usage of the Internet. Meanwhile, Internet use affects eGov development positively (Zhao et al., 2014a, b). The recent years have seen a dramatic increase in the Internet access levels, particularly in developing countries [International Telecommunication Union (ITU), 2018b]. Such development is significantly facilitating the services and adoption of eGov by citizens. Al-Hujran et al. (2014) added that Internet usage is equally a channel for digital democracy, which eases the citizen-government interaction while increasing citizen contributions in eGov services and the progressions of decision making. According to the above discussion, we formulated the hypotheses below:

H₁: *Reliability has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₂: *Reliability has a positive and significant impact on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.*

H₃: *Security has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₄: *Security has a positive and significant impact on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.*

H₅: *Website design has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₆: *Website design has a positive and significant impact on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.*

H₇: *Ease of use has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₈: *Ease of use has a positive and significant impact on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.*

H₉: *Awareness has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₁₀: *Awareness has a positive and significant impact on the attitude of users toward the use of e-government services made available by the Department of Lands and Survey.*

H₁₁: *Attitude of the user has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

H₁₂: *Attitude of user mediates the impact of reliability on the use of e-government services made available by the Department of Lands and Survey.*

H₁₃: *Attitude of user mediates the impact of security on the use of e-government services made available by the Department of Lands and Survey.*

H₁₄: *Attitude of user mediates the impact of website design on the use of e-government services made available by the Department of Lands and Survey.*

H₁₅: *Attitude of user mediates the impact of ease of use on the use of e-government services made available by the Department of Lands and Survey.*

H₁₆: *Attitude of user mediates the impact of awareness on the use of e-government services made available by the Department of Lands and Survey.*

H₁₇: *Digital divide has a positive and significant impact on the use of e-government services made available by the Department of Lands and Survey.*

3. Research Methodology

3.1 Survey instrument

This study employed structured questionnaires in obtaining data from the respondents of the study. The obtained data were used in hypothesis testing. The questionnaire included 37 items representing the study constructs which were included in its conceptual model. These 37 items were from previous works, as follows: items on Reliability, Security and Website Design were adapted from Pitkänen (2020); items on Perceived ease of use were adapted from Chang et al. (2015); items on Awareness were from Alhaddad (2015); items on attitude were obtained from Mazambani and Mutambara (2019); while items on E-government services were from Inkinen et al. (2018). The study items were provided with a 5-point Likert scale. As stated by Leung (2011), the use of this scale allows normal scattering and near-scale accuracy. The questionnaire was the chosen data collecting instrument owing to its aptness with the study context.

3.2 Sample and data collection

Data collection procedure and sample data

The study respondents who were chosen in this study were all Jordanian citizens who were users of e-government services made available by the Department of Lands and Survey. A small sample comprising 30 Jordanians was used for pilot study;

these Jordanian were users of the said e-services. Pilot testing was carried out prior to the actual survey. Purposive sampling was the method used in obtaining the study sample, and the respondents that fit the criteria were chosen. The study questionnaire was delivered to the respondents after their contact information was obtained from their friends and family. A total of 740 respondents received the questionnaire through their social media platforms (Facebook, LinkedIn, WhatsApp, and others). From this number, 407 of them completed and returned the questionnaires, which amounted to 55% response rate, which is acceptable based on Kangu (2017) - 50%-59% response rate can be regarded as acceptable for analysis, 60%-69% response rate is regarded as good, and a response rate of 70% or higher can be perceived as excellent.

Sample profile

The demographic data of the respondents comprised the data on their age, gender and years of experience. In total, there were 407 usable questionnaires, and data from these questionnaires were analyzed using confirmatory factor analysis and model testing. As can be understood from the results, the respondents were mainly male (82.1%), making female respondents the minority (17.9%). In terms of experience in technology, more than half (55.1%) of respondents reported having more than 10 years of experience, while the remaining (44.9%) had less than one year of experience. With respect to the respondents' age, most (58%) were between 20 and 30 years old, 22% were between 31 and 40 years old, while 20.0% were between 41 and 50.

3.3 Testing the Model

Model of Measurement

This study proposed a measurement model that comprises 8 variables covered by 37 measurement items. CFA, which was run through AMOS, was used in evaluating the measurement model. Based on Chen et al. (2012), it can be decided that the model had dissatisfied model fit in its main model fit indices. The measures were beyond the bounds of the cut-off value of the model fit proposed, because CLI, TLI, NFI, IFI, and RMSEA were > 0.08 . Table 1 accordingly shows the model fit statistics for the main measurement model.

Table 1
Primary Measurement Model Fit

X^2	DF	X^2/DF	SRMR	CFI	TLI	NFI	IFI	RMSEA
234.609	62	3.784	0.057	0.798	0.774	0.747	0.800	0.117

For the primary measurement model, factor loadings and modification indices were checked to improve the model fit statistics. Error terms of items with high modification indices were accordingly correlated. The process was repeated and then stopped after the attainment of a satisfactory model fit. Table 2 accordingly displays the improved final measurement model. As shown, the final model has a satisfactory model fit.

Table 2
Final Measurement Model Fit

X^2	DF	X^2/DF	SRMR	CFI	TLI	NFI	IFI	RMSEA
211.201	59	3.579	0.046	0.951	0.938	0.934	0.951	0.067

As shown in Table 2, the value of Standardized Root Mean Square Residual (SRMR) is lower than 0.08. Based on Hu and Bentler (1999), the model has a good model fit. Meanwhile, the value of the Comparative Fit Index (CFI) is more than 0.90. Kline (2005) would deduce from the results that the model has acceptable fit. Furthermore, the Tucker Lewis index (TLI) is higher than 0.90. Sharma et al. (2005) would deduce from the results that the model has excellent fit. Looking at the values of Normed Fit Index (NFI) and Incremental Fit Index (IFI), they are both higher than 0.85. Based on Hu and Bentler (1999), the values denote a good fit. Root Mean Square Error of Approximation or RMSEA is lower than 0.08 denoting excellent fit (Brown, 2015). Hence, it can be deduced that the study model has adequate fit.

Confirmatory Factor Analysis

The factor structure of the set of the observed variables or the factor loadings was verified via the use of confirmatory factor analysis (CFA). Composite reliability (CR), convergence validity, and convergent validity were ascertained, as displayed in the following Table 3. Meanwhile, Table 3 displays the factor loadings for the entire finalized measurement model items. As shown in Table 3, the values of Cronbach alpha were between 0.879 and 0.975, which are more than 0.70, denoting reliability.

Table 3
Confirmatory factor analysis results (Factor loading)

<i>Latent Variable</i>	<i>Indicator</i>	<i>FL</i>	Cronbach's Alpha	CR (> 0.70)	AVE (> 0.50)
Reliability	R1	0.608	0.879	0.876	0.592
	R2	0.895			
	R3	0.777			
	R4	0.899			
	R5	0.613			
Security	S1	0.947	0.958	0.970	0.866
	S2	0.927			
	S3	0.946			
	S4	0.898			
	S5	0.935			
Website Design	WD1	0.917	0.889	0.90	0.645
	WD2	0.688			
	WD3	0.761			
	WD4	0.838			
	WD5	0.792			
Ease of Use	EOU1	0.791	0.902	0.927	0.719
	EOU2	0.863			
	EOU3	0.884			
	EOU4	0.865			
	EOU5	0.834			
Awareness	A1	0.982	0.903	0.945	0.779
	A2	0.972			
	A3	0.650			
	A4	0.891			
	A5	0.877			
User Attitude	UA1	0.872	0.907	0.929	0.726
	UA2	0.763			
	UA3	0.984			
	UA4	0.758			
	UA5	0.863			
Digital Divide	DD1	0.973	0.975	0.98	0.908
	DD2	0.992			
	DD3	0.927			
	DD4	0.954			
	DD5	0.917			
Use of e-government Services	UES1	0.856	0.736	0.769	0.627
	UES2	0.722			

FL = Factor Loading, FLS = Factor Loading Squared, AVE= Average Variance Extracted, CR= Composite Reliability

As can be viewed in Table 3, the loadings of all items were between 0.613 and 0.992. Based on Bollen (1992), the results are acceptable as they are larger than the value 0.50. Meanwhile, composite reliability (CR) and average variance extracted (AVE) were used in testing the convergent validity. As shown in Table 3, values of composite reliability fell in the range between 0.769 and 0.98. These values denote excellent internal consistency as they are all larger than 0.7. As for the values of AVE, they are between 0.592 and 0.908, which shows that the latent variables fulfilled the standard for convergent validity, as the values are all larger than 0.50 as proposed by (Hair, 2022).

Discriminant Validity

Discriminant validity is the degree to which factors are different and unconnected. The obtained results are displayed accordingly in Table 4.

Table 4
Discriminant Validity Test

	R	S	WD	EOU	A	UA	DD	UES
R	0.592							
S	0.378	0.866						
WD	0.578	0.215	0.645					
EOU	0.381	0.333	0.417	0.719				
A	0.521	0.347	0.530	0.623	0.779			
UA	0.556	0.218	0.547	0.618	0.545	0.726		
DD	0.547	0.303	0.351	0.548	0.538	0.255	0.908	
UES	0.430	0.203	0.534	0.579	0.694	0.701	0.424	0.627

** . Correlation is significant at the 0.01 level (1-tailed), * . Correlation is significant at the 0.05 level (1-tailed).

Discriminant validity results and the AVE square root values can be referred to in Table 4. The results are larger than any correlation coefficients between constructs. It can thus be said that the constructs are not very highly correlated with one another. The finalised best-fitting model is illustrated in the following Fig. 1.

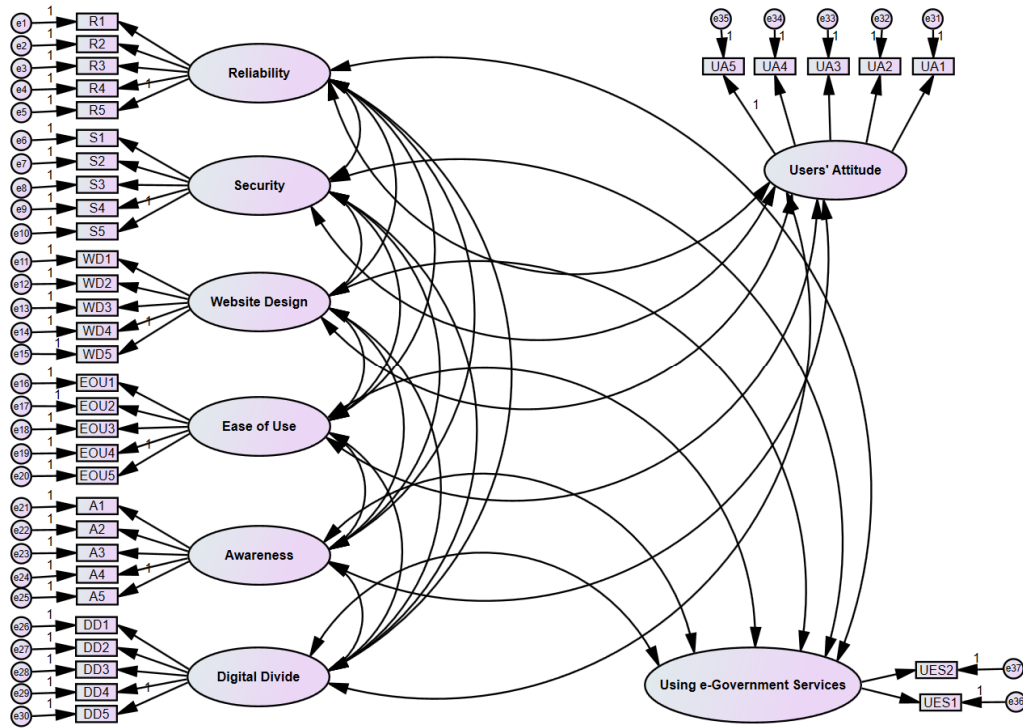


Fig. 1. CFA Model

3.4 Testing the Hypotheses

This study employed variance-based Structural Equation Model (SEM) in hypothesis testing as SEM could model the connections between multiple dependent and independent variables. SEM was run using Amos version 23. Results are as displayed below.

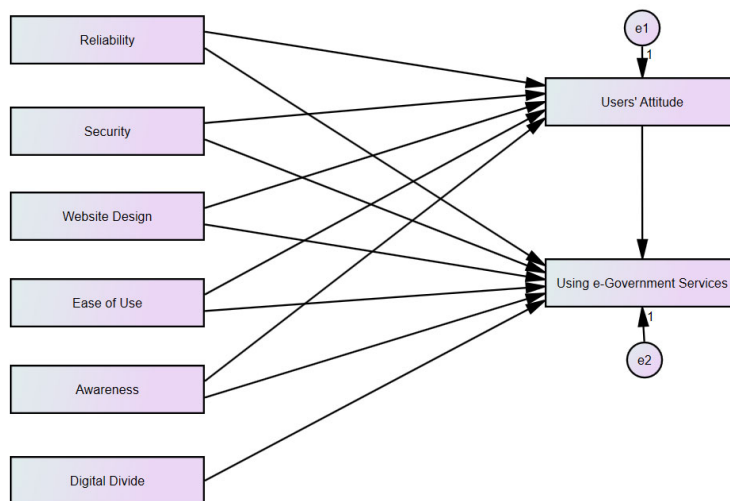


Fig. 2. SEM Model

SEM results are displayed in the following table.

Table 5
Structural Equation Modelling Regression weights

		Estimate	S.E.	C.R.	P	Effect	R ²
Reliability	→ Use of e-Government Services	.319	.050	5.43	***	.314	-
Reliability	→ User Attitude	.483	.092	8.122	***	.470	-
Security	→ Use of e-Government Services	.261	.095	4.363	***	.253	-
Security	→ User Attitude	.215	.086	3.281	***	.210	-
Website Design	→ Use of e-Government Services	.158	.061	2.677	.007	.155	-
Website Design	→ User Attitude	.164	.033	2.800	.003	.161	-
Ease of Use	→ Use of e-Government Services	.272	.070	3.905	***	.270	-
Ease of Use	→ User Attitude	.223	.065	5.351	***	.219	-
Awareness	→ Use of e-Government Services	.155	.056	2.760	.006	.166	-
Awareness	→ User Attitude	.082	.041	1.998	.046	.122	-
Digital Divide	→ Use of e-Government Services	.104	.052	2.587	.047	.102	-
User Attitude	→ Use of e-Government Services	.146	.046	3.179	.001	.230	-
R²		Use of e-Government Services		R²		User Attitude	
		0.309				0.255	

S.E. = Standard errors of the regression weights, C.R. = Critical Ratio, P = p-value

Results in Table 6 can be elaborated as follows:

Results of regression weights proved significant effect of Reliability on e-Government Services use (critical ratio value > 2; p-value < 0.001 (***); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the first alternative hypothesis was accepted. For Reliability, on e-Government Services use, the effect size was 0.314. In addition, results showed significant effect of Security on e-Government Services use (critical ratio value > 2; p-value < 0.001 (***); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the third alternative hypothesis was accepted. For security, on e-Government Services use, the effect size was 0.253. Moreover, results showed significant effect of Web Design on e-Government Services use (critical ratio value > 2; p-value < 0.001 (0.007); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the fifth alternative hypothesis was accepted. For Web Design, on e-Government Services use, the effect size was 0.155. Furthermore, results showed significant effect of Ease of Use on e-Government Services use (critical ratio value > 2; p-value < 0.001 (0.007); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the seventh alternative hypothesis was accepted. For Ease of Use, on e-Government Services use, the effect size was 0.270. Next, results showed significant effect of Awareness on e-Government Services Use (critical ratio value > 2; p-value < 0.001 (0.006); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the ninth alternative hypothesis was accepted. For Awareness, on e-Government Services Use, the effect size was 0.166.

Results of regression weights showed significant effect of Digital Divide on e-Government Services Use (critical ratio value > 2; p-value < 0.047 (0.007); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the eleventh alternative hypothesis was accepted. For Digital Divide, on e-Government Services Use, the effect size was 0.102. Furthermore, results showed significant effect of User Attitude on e-Government Services Use (critical ratio value > 2; p-value < 0.001 (0.001); $\alpha \leq 0.05$, which demonstrate significance of path based on Byrne (2013)), and so, the twelfth alternative hypothesis was accepted. For User Attitude, on e-Government Services Use, the effect size was 0.230.

User Attitude's mediating effect was tested (see results in Table 5). For mediating effect: full mediating effect can be ascertained only when the indirect effect is bigger in comparison to the direct effect, as noted in Hair et al. (2010). User Attitude was shown to act as mediator to the relationship between Reliability, Security, Website Design, Ease of Use and Awareness, and Use of e-Government Services. As such, H12, H13, H14, H15 and H16 were supported.

Table 6
Results of mediation of hypotheses

Hypothesis	From	mediation	To	Direct effect	Indirect effect	Mediation
H12	R	UA	UES	0.002	0.111	Supported
H13	S	UA	UES	0.004	0.122	Supported
H14	WD	UA	UES	0.006	0.221	Supported
H15	EOU	UA	UES	0.046	0.109	Supported
H16	A	UA	UES	0.036	0.144	Supported

4. Discussion

Results showed that reliability and the use of the e-government services offered by the Department of Lands and Survey were significantly and positively linked, demonstrating support to H1. This finding is in line with Ali (2019), AlShamayleh et al. (2015) and Taherdoost and Madanchian, (2021) – they all reported reliability as a good predictor, and it strongly affected the use of e-services provided by Department of Lands and Survey. In Table 6 of the results for H1, reliability affects e-services usage. As can be deduced from this finding, social media should show reliability, and only then, the e-services provided through it would be used by the user. Hence, an increase in reliability will result in more frequent use of the e-services furnished by the Department of Lands and Survey.

Results showed a significant and positive relationship between security and the use of the e-government services by the Department of Lands and Survey, which means that H3 was supported. Similarly, Elsantil (2020), Panthee and Sharma (2019) were reporting on the critical role of security in e-services usage. As can thus be deduced, social media should first establish its security assurance before users can use the e-services that it provides. Hence, the increase in the security level in the e-government services by the Department of Lands and Survey will increase usage as well as likelihood of usage among the citizens.

Additionally, results showed that website design and e-government services use were significant and positively related, which means that H5 was asserted. This shows that users felt that the design of the website of e-government services by the Department of Lands and Survey significantly affected their decisions to use or not use the said services. Shayganmehr and Montazer (2020), Al Shamayleh et al. (2015), Sharma et al. (2019) and Ezziane (2019) were among those who reported similar findings. Table 6 can be referred to; it shows the effect of website design on the use of e-services. Hence, the social media website of the Department of Lands and Survey should be simple and organized to increase the citizens' e-services usage. Equally, social media websites that are simpler and more organized will be used more frequently.

A significant and positive relationship was shown by the results, between ease of use and the use of e-government services provided by the Department of Lands and Survey, which means, H7 was supported. Shamayleh et al. (2015), Zeglat et al. (2016), Al Balushi and Ali (2016) and Ahmad et al. (2020) reported similar results – they found ease of use a good predictor to usage. In the context of this study, the factor of ease of use is critical in the use of the e-services by the Department of Lands and Survey. Detailed results can be viewed in Table 6. Users of e-services provided by the Department of Lands and Survey could be classed into various age groups and cultural backgrounds. Hence, the ease-of-use factor will motivate users to use the e-services again, and it is important for the Department of Lands and Survey to come up with a website that caters to users of different age groups and cultural backgrounds, to increase usage and repeat usage.

The obtained results showed that awareness was significantly and positively linked to the utilization of e-government services provided by the Department of Lands and Survey, demonstrating support to H9. Like Nayanajith et al. (2019), Oyieke and Dick (2017) and Baharuddin and Rosman (2020), this study also found a substantial role of awareness in e-services use. Detailed results can be viewed in Table 6. The table shows that e-services use is affected by the factor of awareness. As can be construed, those with high awareness of the e-government services by the Department of Lands and Survey and of the importance of such services, are more likely to demand more of the use of such services.

Results showed a significant impact of reliability on the attitude of users towards the use of e-government services made available by the Department of Lands and Survey, which means that H2 was supported. As shown in Table 6, the impact of reliability on the attitude of the user was both positive and significant. Similarly, Weber et al. (2020) and Chung and Koo (2015) reported reliability as a major factor in the formation of a positive attitude towards e-services acceptance and adoption. Details of the results can be viewed in Table 6. As can be construed from the results; if the e-government services provided by the Department of Lands and Survey are delivered on a reliable social media website, it will be more likely that citizens would show a positive attitude towards the use and the repeat use of the provided services. On the other hand, poor reliability will result in a negative attitude of the citizens towards the use and repeat use of the services.

The significant impact of security on the attitude of users toward the use of e-government services provided by the Department of Lands and Survey was demonstrated. This means that H4 was supported. Burak and Ipek (2021) also found a significant effect of security on the attitude of users toward e-government services use. Details of the results can be viewed in Table 6. For the Department of Lands and Survey, the provision of e-services on a secure social media website will encourage use and repeat use, and positive attitude of users towards the website. On the other hand, a poor level of security will generate negative attitudes among users.

The obtained results showed a significant relationship between website design and the attitude of users towards the use of e-government services by the Department of Lands and Survey, which denotes support to H6. Details of the results can be viewed in Table 6. Similarly, Al-Hawary and Al-Menhaly (2016) reported a significant link between the website design factor and the attitude of users toward the adoption of e-services. This finding shows that if the Department of Lands and Survey

could provide users with a well-constructed and coordinated website to deliver its e-government services, the usage rate as well as the repeat usage rate of the services will be higher, and such a website is likely to be perceived as attractive. Attractive websites will foster positive attitudes, and vice versa.

Results showed a positive and significant effect of the factor of ease of use on the attitude of users toward usage of e-government services provided by the Department of Lands and Survey. This means that H8 was supported – details of the results can be viewed in Table 6. Based on these results, a technology that offers ease of use will increase the inclination of users towards the adoption of e-services provided by the Department of Lands and Survey. Similarly, Bailey et al. (2018) and Dzandu et al. (2016) were reporting significant and positive linkage between the factor of ease of use and the attitude of users toward the use of e-services. User attitude towards e-government services provided by the Department of Lands and Survey is strongly affected by the factor of ease of use. Users that find the use of the services easy will likely have a more positive attitude towards the services, and such an attitude will increase the likelihood of users to repeat the use of the services, and vice versa.

Results showed significant and positive linkage between awareness and attitude of users toward the use of e-government services by the Department of Lands and Survey, and so, H10 was supported – details of the results can be referred to in Table 6. Similar findings were reported by Burak and Ipek (2021) and Brougham and Haar (2017) – the authors reported a linkage existing between the factor of awareness and user attitude toward the use of e-services provided by the Department of Lands and Survey. It can thus be deduced that the attitude of user towards the e-services provided by Department of Lands and Survey via its website is strongly affected by the awareness of user toward of the website, and the more awareness that user has towards the website, the more positive the attitude of the user, leading to repeat use. On the other hand, lack of awareness will reduce the likelihood of using the services and the likelihood of users forming a negative attitude will increase.

Results showed a significant link between the attitude of users and the use of e-government services by the Department of Lands and Survey. As such, H11 was supported. Details of the results are shown in Table 6, denoting the impact of the attitude of the user on the use of e-services provided by the Department of Lands and Survey. Chen et al. (2018), ALabdallat (2020) and Majdalawi et al. (2015) were among those who reported a significant link between user attitude and e-services use. This finding shows that user attitude toward usage of the e-services provided by the Department of Lands and Survey will determine the actual usage or non-usage of the services. Here, a negative attitude will make users choose the traditional method of obtaining services (physically visit the municipal building to obtain the services), while a positive attitude will increase the likelihood of users to use the e-services (go online to obtain the services).

Results on the mediation effect showed that the mediation of the attitude of the user was significant and positive, and so, H12 was supported. Attitude of user was shown to mediate the effect of reliability on e-government services use, that is, via attitude of user, the reliability of social media imparts impact on the use of the e-government services provided by Department of Lands and Survey – details of the results can be viewed in Table 6. Mou et al. (2017) and Ali (2019) were among those who reported similar findings. The results led to the understanding that if the websites of social media that offer the e-services are defined by reliability through user attitude improvement, then, the demand of users towards the use of e-services will rise. The support for the Department of Lands and Surveys e-services usage results from the positive attitude of users towards the reliability of social media platforms in making available the e-services to the Department of Lands and Survey.

Results show a significant effect of the factor of digital divide on the intent of Jordanians to use e-government services. Additionally, ICT usage seemed significant statistically regarding population density of the city (rurality), affecting larger areas on ICT usage, because, as reported in Cruz-Jesus et al. (2012), making available the IT infrastructure in bigger geographical areas is not an easy task. Providing the citizens with eGov services is thus challenging. Additionally, for bigger geographical areas, ICT can become an alternative communication method (Forman, 2005). Indeed, Internet access via mobile devices is limitless today, and so, local governments should invest in eGov services to increase adoption and to increase the satisfaction of citizens as well, in areas of varied density.

Mediation of the attitude of the user was shown to be significant and positive on the effect of security on the use of e-government services provided by the Department of Lands and Survey, denoting support to H13 – details of the results are shown in Table 6. Via the attitude of the user, security of social media impacts how the e-government services by the Department of Lands and Survey are being used. Alassaf and Szalay (2022) reported similar findings. Assurance of security of the website increases the positive attitude of the user, which consequently will increase the demand of users towards the use of the e-services. Having a positive attitude toward the security of social media that provides e-services to the Department of Lands and Survey will make users supportive of the idea of using the services.

Additionally, results showed that through the attitude of the user, the website design impacts the way the e-government services by Department of Lands and Survey are used, and this shows support to H14 – Table 6 displays the detailed results. Similarly, Alassaf and Szalay (2022) and Shayganmehr and Montazer (2021) presented similar results, that the attitude of users mediates the impact of website design on the use of e-government services provided by the Department of Lands and

Survey. A social networking site that appears elegant, organized and tidy is more likely to increase the demand of users towards using the e-services that it provides, through the improved attitude of users toward the site. The positive attitude of the user toward using the services will encourage others to use the services too.

Results showed the mediation effect of the attitude of the user on the effect of ease of use on the use of e-government services provided by the Department of Lands and Survey – the attitude of user mediates the effect of ease of use of the e-services – and so, H15 was supported. Details of the results can be viewed in Table 6. Through the attitude of the user, ease of use of social media impacts the use of e-government services provided by the Department of Lands and Survey, and this finding was also documented in several studies including Bataineh and Al Mutawa (2016) and Zamil et al. (2020). Websites that offer ease of use will generate a more positive attitude of users, leading to the demand of users toward e-services use. Such a positive attitude results in support of citizens towards the use of the services while also encouraging others to use the services too.

Results also showed mediation of the attitude of users on the effect of awareness toward e-government services use, which means support to H16 – details of the results can be observed in Table 6. Ranaweera (2015) and Matveieva et al. (2022) reported similar findings, that the attitude of users mediates the impact of awareness on the use of the e-services provided by the Department of Lands and Survey. Awareness toward services will foster a positive attitude, and as a result, users will support the idea of utilizing Department of Lands and Surveys e-services and will want to repeat the use. Furthermore, awareness of the significance of social media in making available the e-services of the Department of Lands and Survey and awareness pertaining to the usage of these sites will result in users adopting a positive attitude towards using the site in question. On the other hand, lack of awareness can result in the formation of negative attitudes, which will hinder usage of the services, and consequently, reduction in the demand for the e-services.

5. Practical contribution

This study brings value to real-world applications, in addition to being of value to academia and political culture. The findings have worthwhile implications. Firstly, the rapid progression of technology and the Internet has let the citizens handle many of their daily affairs virtually, even when communicating with the government. The Department of Lands and Survey became the study focus, as it is considered a main municipal organization in Amman, particularly in the e-services delivery. Clearly, the attitude of users toward the demand for these e-services is affected by social media usage and characteristics. All the employed variables were antecedents to the use of e-government services provided by the Department of Lands and Survey. Findings of this study could facilitate decision makers in municipalities in forming the necessitated strategies and policies. For policymakers involved in e-governance especially, this study has implications. Firstly, there should be sustainable e-governmental systems in place, and it is important that the government prioritizes the initiatives as an effort to bridge the access gap. Citizens should be provided with equal access to information and communication technology (ICT) so that e-government services usage would become easier for citizens. In other words, ICT infrastructure should be accessible to everyone. In achieving this, public spaces should be equipped with free internet access as these public spaces (parks, retail centers, airports, etc.) are often frequented, and with the free internet access, people will be more motivated to use the e-government services. On the other hand, citizens must have digital skills to be able to use the e-government services. Hence, the government should provide proper training and awareness to citizens to make them more able and more confident towards utilizing these services, by making known the existing e-government services and their benefits to citizens. Citizens can be made aware of the services through print and electronic advertisements, to foster a positive attitude towards the use of these services. This will increase their interest in exploring these services and gaining benefits from them. User-friendly and easily accessible services will widen usage as citizens' interest and willingness towards usage will increase.

6. Research Implications

Some major implications of this study are discussed in this section. Firstly, the findings affirmed that reliability, security, website design, ease of use, awareness and digital divide could effectively justify online behavior of customers. For future studies on online behavior, some other factors that may provide a better explanation may be considered. Additionally, future studies may consider including other sets of antecedents or mediator variables. Furthermore, confidence and control over perceived conduct in addition to subjective norms, are among the variables that may yield interesting or beneficial findings. Next, this study examined two qualities of the social media that provide e-government services of the Department of Lands and Survey namely reliability and security, from the five qualities explored in this study. As such, this study recommends the examination of more regulated subsets of users and environments in future studies, to identify (if any) the exceptions and limitations of usage behavior. Additionally, a longitudinal approach should be considered, in order to detect any potential change in behavior with the time passing. Various findings about the vital elements that could significantly impact the e-government services by the Department of Lands and Survey are presented in this study as well. Clearly, government institutions and other organizations that offer e-services through social media platforms could greatly benefit from the findings of this study, especially those in Jordan and those in other developing countries.

For public sector decision makers, this study's findings would facilitate them in understanding the significance of the attitude of citizens (as users of e-services) in the use of e-government services via social media in Jordan. Having the grasp of how social media characteristics are applied in e-services presentation, the government could effectively design intensive promotional campaigns to get the citizens interested and exploit these services via social media. Also, the findings show the need for the government to increase the security of their systems and website. This will reduce the perceptions of citizens of the risks in financial transactions, especially in taxes and electronic payments. Additionally, decision makers need to increase the awareness of the public of all the e-services available and the advantages of using these services, to increase usage and repeat usage among citizens as users.

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