



**International Journal of Services, Economics and Management**

ISSN online: 1753-0830 - ISSN print: 1753-0822  
<https://www.inderscience.com/ijsem>

---

**Examining the trends in citizen satisfaction towards e-government services in United Arab Emirates: a structural equation modelling approach**

Tareq Alblooshi, Moer Azli, Mohd Faiz Hilmi, Anas Abudaqa, Gouher Ahmed

**DOI:** [10.1504/IJSEM.2023.10054642](https://doi.org/10.1504/IJSEM.2023.10054642)

**Article History:**

Received:	04 August 2021
Last revised:	17 November 2021
Accepted:	18 July 2022
Published online:	16 March 2023

---

## Examining the trends in citizen satisfaction towards e-government services in United Arab Emirates: a structural equation modelling approach

---

Tareq Alblooshi, Moer Azli,  
Mohd Faiz Hilmi and Anas Abudaqa

School of Distance Education,  
Universiti Sains Malaysia,  
Penang, Malaysia  
Email: tareq.alblooshi@student.usm.my  
Email: azli@usm.my  
Email: faiz@usm.my  
Email: abudaqa1@gmail.com

Gouher Ahmed\*

School of Business,  
Skyline University College,  
Sharjah, UAE  
Email: gouher@usa.net  
\*Corresponding author

**Abstract:** In the field of public services, the title of citizen satisfaction and dissatisfaction has gotten significant attention both in recent and past literatures. The purpose of this research is to examine the trends in citizen satisfaction for e-government services as observed through service usefulness, service ease of use, information awareness and service quality, based on 364 valid samples from UAE. After examining the measurement model, the structural model is applied through Smart PLS-SEM for both direct and moderating effect, and the study result confirms that there is a significant and positive impact of e-service ease of use, information awareness, e-service quality, and online trust on citizen satisfaction to e-government services. The empirical findings of the study contribute by providing useful and practical insights to various stakeholders who are responsible for managing and providing e-government services for better citizen satisfaction.

**Keywords:** e-government services; citizen satisfaction; service usefulness; UAE.

**Reference** to this paper should be made as follows: Alblooshi, T., Azli, M., Hilmi, M.F., Abudaqa, A. and Ahmed, G. (2023) 'Examining the trends in citizen satisfaction towards e-government services in United Arab Emirates: a structural equation modelling approach', *Int. J. Services, Economics and Management*, Vol. 14, No. 1, pp.58–77.

**Biographical notes:** Tareq Alblooshi is a PhD (Business Management) student at Universiti Sains Malaysia. He has done his Master's in HRM from Abu Dhabi University, and BSc in Computer Science from Higher College of Technology. He has more than 15 years of experience in the ICT field in one of

the public entity in the UAE. His research interests are in computer science applications, organisational performance, data governance, and data management.

Moer Azli is a Marketing Professor at Universiti Sains Malaysia. He has earned his PhD from the University of Hull. His research interests fall in the in the area of marketing communication, consumer behaviour, and political marketing. He has published many articles in well-reputed journals in the marketing domain.

Mohd Faiz Hilmi is a Professor in Technology and Innovation Management at Universiti Sains Malaysia. He has DBA, MBA (Management), 2008 from USM, and BBA (MIS) from Washington State University. He has more than 25 publications within his interest's area, Currently, he is supervising 14 PhD students and his research projects focuses on the following areas; technology & innovation management , innovative behaviour, e-learning and distance education.

Anas Abudaqa is a proficient and result oriented petroleum engineer working for ADNOC Group. Abudaqa is CIPLD Level 7, PMI-PMP and PMI-PBA certified professional. He has earned his MSc (Petroleum Engineering) from Heriot Watt University, UK, MBA from IMT Business School, MSc (Innovation, Leadership and Management) from University of York, UK, and his PhD (Business Management) from Universiti Sains Malaysia. Abudaqa managed to publish more than ten articles in Scopus indexed journals and his research interests includes HRM, organisational behaviour, leadership, organisational agility, and innovation and technology management.

Gouher Ahmed is a PhD, PMP with over 25 years of experience in various academic, social and business settings worldwide and consulting through North America, South Asia and Middle East. He has played a critical role in helping organisations formulate winning strategies, drive many change initiatives and improve business results. He has accumulated over 200 research publications and presented in 100 international conferences. His teaching, research and publications are focused on international business, foreign trade, emerging markets, entrepreneurship and strategic leadership. He is currently a Full Professor of Strategic Leadership and International Business at the Skyline University College, UAE.

---

## **1 Introduction**

In the field of public services, the title of citizen satisfaction and dissatisfaction has got significant attention both in the recent and the past literature. In this regard, various administrative reforms and related initiatives have been taken up by the government in different regions in order to create a linkage between the public services provided by the government and satisfaction from the community members as well. This would indicate a good trend towards restoring the public trust towards the government and various departments as well. However, the historical review of public services makes it clear that administrative reform during the time of 1980–1990 have introduced the idea of treating citizens as client and making the public services towards more client oriented. This has provided a dramatic change in the field of public services while trying to deliver the clients a pleasurable experience while turning the traditional service mechanism in a

bureaucratic state to service delivery machine as expressed by Schedler and Proeller (2002), Flynn (2012), Greener (2012), Wei (2014), Akbari et al. (2020) and Ting et al., (2020).

In addition, the title of customer orientation is reflected in the rise of various tools to assist the public services along with providing the sense to the citizens that they are treated in a better way. Such tools and techniques include the public surveys to capture what the citizens want from the provided services by the governmental organisation. Furthermore, the establishment of complaint mechanism and ombudsman institutions in different public sector organisations are some of the core features as observed since the time of 1990s. Meanwhile, the introduction of customer charters can be viewed as a very symbolic event signalling that public sector organisations are increasing taking care about the public services, hence creating a significant positive linkage between the government and citizens (Thomassen et al., 2014). More specifically, some examples for the citizens charter include the citizen charter in the UK during 1991 (Duggett, 1998; Fyfe, 1993; Page, 1999), The French Charte des Services Public in 1992 (Van de Walle, 2018), the Charter of the User of Public Services in Belgium (Van de Walle, 2018), introduced in 1992/1993 and various both in developed and developing economies. However, it is observed that these charters have been transformed into some title of operational services-specific charters. During the time of 1990s, the emergence of e-government has been risen along with some significant attempts to make public services more assessable. A shift has also been observed from the institution centric, to one that was accepted as citizen-centred and demand driven as well (Van de Walle, 2018).

In addition, the advent of internet has dramatically changed the pattern of service transactions from face-to-face to e-services (Ahmad et al., 2020). This is due to the fact that e-services are now providing the convenience to customers, low transactional costs, significant accessibility to services, and reduction of time constraints as well (Ahmad et al., 2020). Meanwhile, both theoretical and empirical studies have provided their view regarding the need to consider the dynamic beliefs in information technology and its usage for both public and private organisations. Furthermore, organisations are constantly working on making information technology as an integral part of their operational activities in order to stay alive under competitive market environment (Oliveira et al., 2014). This e-service orientation is widely observed both in developed and developing economies where the technology acceptance model (TMA) indicates the acceptance as well as usage of latest technologies (Ahmad et al., 2020). In the contemporary environment, TMA has widely been applied for understanding and explaining the usage of information technology.

It is believed that over the past two decades, the evaluation of e-government services specifically from the context of citizen perception has got some major attention from academic experts and researchers (Alkrajji and Ameen, 2021). This is due to the fact that increasing number of citizens who are using such services is the key to success of such services. However, one of the key gap as observed in the existing literature which also motivate the researcher to conduct an empirical analysis is that only a few number of research studies have focused towards citizen satisfaction towards e-government services. From the context of UAE, it is found that the journey of e-government in Dubai has been started since 2000 when the government of UAE has decided to work through some radical changes in the state-level management. However, before the advent of e-governance in the region, the government of UAE was serving its citizens through some manual means. For example, individual needs to make an application in the hard

form while compiling some necessary documents and finally submitting it to the relevant department (Sahib, 2015). However, the main short coming of this system was that it is under massive delays with the significant level of frustration from the citizens because of so much time to resolve their issues. To overcome this issue, government has adopted the method of e-governance in order to reduce the losses due to manual system (AlSayegh et al., 2019). The core mission of government was to achieve a system of virtual governance through which it can provide a high-quality customer-oriented e-services to various business units, individuals and community members (Kumar and Dash, 2015). The Dubai Government has a target to provide e-services to 70% of its citizens by the end of 2025. To achieve this mega objective, Dubai e-government was renamed as the Dubai Smart Government which is proposed by Sheikh Mohammed bin Rashid Al Maktoum in 2013.

Based on the study background, following are the research questions which are under observation.

- RQ1 What is the relationship between service usefulness and citizen satisfaction to e-government services?
- RQ2 What is the relationship between service ease of use and citizen satisfaction to e-government services?
- RQ3 What is the relationship between information awareness and citizen satisfaction to e-government services?
- RQ4 What is the relationship between service quality and citizen satisfaction to e-government services.
- RQ5 What is the relationship between citizen satisfaction to e-govt services and e-services continuance intention?

## **2 Literature review**

### *2.1 E-government*

In present economy, adoption of e-government is one of important concepts to deliver facts about government to the general public by using online tools, websites, social media, etc. Moreover, e-government increases the efficiency (less use of resources) and effectiveness of the government department because people can access the government virtually through e-government without any hurdle. Digitisation of the government services is referred as the e-government. Sometimes both the digital govt. and e-govt. are interchangeably used. Sometimes the term e-services is also used to denote to the digitisation of the services and defined as the “interactive software-based information systems received via the Internet” (Featherman and Pavlou, 2003). Although different definitions and concepts are there to represent the e-govt. but the present study specifically emphasises on the term e-government. It has been widely defined by the academicians and scholars globally. It is worthy to note that e-government is differently defined by the organisations, specialists, and researchers but the core concept remained the same which is the utilisation of the information and communication technologies to provide the services so that individuals and businesses can be served optimally.

E-government can be classified in three distinct ways based on its operations, role of the citizens and development orientation: Virtual socialisation process, virtual value chains and IT artefacts (Tan and Benbasat, 2009). In addition, research work as conducted by Alkrajji and Ameen (2021) have considered the context of e-government services while observing the governmental universities in Saudi Arabia. Data was collected through questionnaire technique from 780 foundation-year students who have utilised the e-services during their admission as provided by government of Saudi Arabia. Their findings reveal that e-government services in public sector organisations like universities have got some reasonable level of customer's loyalty as described by service quality and other factors. Furthermore, some other authors like Norris and Reddick (2013) have also taken into account the title of e-government and related services. It is explained that e-government is based on the utilisation of information and communication technologies for a better government or some improved services while using internet or web technologies. Meanwhile, under e-government services, government is the main adopter of the technology, system manager and content contributor (Norris and Reddick, 2013). Besides, it is also explained that towards e-government services, the role of social media platforms cannot be neglected.

## *2.2 Service usefulness*

Generally, usefulness can be regarded as the perceived usability of a product or service. It can be defined as the degree to which an individual believes that a specific technology utilisation will increase his/her job performance (Davis, 1989). In context of government it can be regarded as the degree to which the citizens of a country or state consider that interacting and using the e-services provided by the government significantly smoothen and improves their interaction with government (Al-Kaseasbeh et al., 2019). It is the individual perception of about the usefulness of any innovation which helpful to enhances the performance, quality of the performance, and knowledge challenges. Therefore, perceived usefulness or ease of use improves the use of internet technology. For example, if citizens of the country perceive that usefulness of e-government is easy and users friendly, then they try to save time by paying taxes and bills to the government by using e-government applications. The perceived usefulness of internet technologies helps enhance employees' performance. It enhances the trust in e-government and plays a positive role in enhancing the intention to adopt e-government services (AlAwadhi, 2019). Upadhyay et al. (2018) have considered the title of service usefulness and attitude in order to determine the level of usage of technology by sales professionals in Indian economy. They have collected primary data through questionnaire while applying confirmatory factor analysis and structural equation modelling techniques. The study findings confirm that service usefulness is a good indication towards the adoption of e-services by sales professionals. In addition, a detailed review of the literature reveals that perceived usefulness is a significant determinant which may lead towards the usage of information technologies by individuals (Venkatesh and Davis, 2000).

## *2.3 Service ease of use*

Ease of use is opposite to complexity of a service. A service is said to be easy when the users do not find it difficult to interact with it and do their tasks easily. It is one of the important factors that lead towards the service adoption. TMA is widely used to explain

the factors for the technology usage among public. Ease of use is one of the components of the TMA. It can be generally defined as the degree to which an individual feels that a particular technology is easy to understand and use (Al-Momani and Mohd Noor, 2009). Ease of use of a particular application or website is generally studied to explain the different outcomes such as satisfaction of users and intention to further use it, etc. (Davis, 1989). Ease of use is the extent to which a person believes that the system is effort free, it is the believe and it comes through the interaction with particular system (Davis, 1989). Ease of use plays a vital part in forecasting the employees' intentions towards acceptance of technology. For users a system or technology becomes more convenient when they have gain experience through exploring a system and that also contribute towards sufficient knowledge and confidence (Hackbarth et al., 2003). Service ease of use enables the citizens or users to use the services more frequently as compared to the services that are not easy to use (Chen and Aklikokou, 2020). However, there can be a possibility that user feel difficulty while interacting with the system. So proper seminars, awareness programs, trainings should be provided. Sometimes the sole reason is motivation, as employees are not motivated towards the usage of a new system, for those motivational seminars should be held and management should also encourage them (Samuel et al., 2018). Meanwhile, the title of service ease is examined along with some other exogenous as well as endogenous constructs. For example, Wajdi and Djamin (2021) have examined the relationship between e-service quality and ease of use in terms of customer relationship management performance. Their research was quantitative in nature where the data from 100 e-commerce customers was collected. The study findings show that service ease of use is a good indication towards providing some brand recognition. At the same time, service ease of use is directly linked with the customer relationship management performance. In this regard, perceived ease of use is a good perception of convenience under which individual believe that utilisation of technological facilities is free from efforts.

#### *2.4 Information awareness*

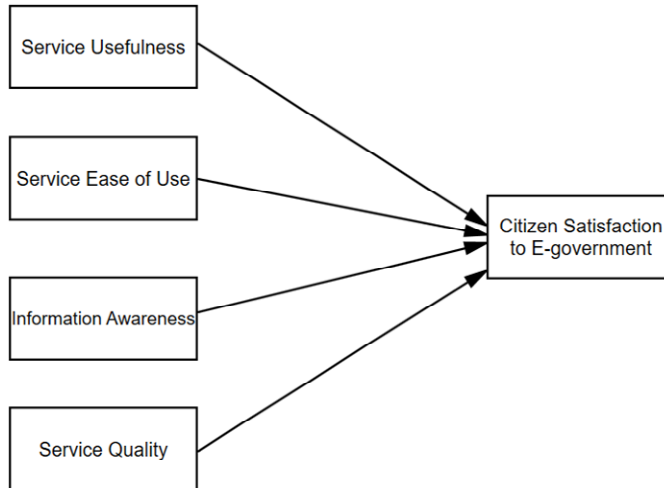
Awareness is necessary in every domain of life as it helps us to take decisions, go for something and refrain from something. It has a vital role in creation of information and knowledge regarding a particular product and service. Individuals use the products and services as per their awareness about them (Palaco et al., 2019). Appropriate communication creates awareness among the people which later on serves as a tool to adopt or refrain from adopting something (Butt et al., 2019). Awareness is necessary and plays a vital role in introducing the products and services (Haseeb et al., 2019). Similarly, from marketing context, awareness about the products and services tend to develop a sense of confidence among people and help them to evaluate the potential target market. The access and availability of the appropriate knowledge and information about the products and services results in positive outcomes.

#### *2.5 Service quality*

E-government is different from the traditional style of government and is regarded as the prominent and effective way to serve the citizens. It is aimed at to provide the citizens with the best of the services so they can be served productively and result in their satisfaction. All of these factors have resulted in creating in satisfaction among the people

(Anwer et al., 2016). It is to be noted that service quality is one of the key factor that can help the organisations to be sustainable and drive the forces for its accomplishment (Santos, 2003).

**Figure 1** Theoretical framework of the study



Services quality varies with the organisations. In context of government, services quality can be regarded as the extent to which the portals introduced by governments aids the effective and productive delivery of e-services. The aim of these services is to facilitate citizens, business community, and public for ensuring the successful interaction with the government institutions (Mensah et al., 2017). From a user perspective it can be regarded as the quality of a service that can serve as a tool or predictor of the government performance and defines its satisfaction with the websites since it meets all their expectations. It is regarded as the degree to which websites and online portals provided by the organisations offer the citizens with the productive delivery of the services to them. It represents the overall quality in sense of features and attributes related to the services being offered to the citizens by a government (Psomas et al., 2020). Meanwhile, the title of e-service quality is also under the observations of the researchers specifically in the recent time. In this regard, Demir et al. (2020) have examined both direct and indirect effect of e-service quality on the satisfaction and perceived value for the online education system in Iraq. Their prime focus was on lecturers as working in different private universities of Kurdistan region of Iraq. Their study has collected the data through questionnaire from 200 respondents and analysed through SEM technique. It is observed that e-service quality directly affects the level of satisfaction towards online meeting platforms in the targeted region. The above stated findings have revealed that although service usefulness or similar terms have got somehow attention in the recent years. However, one of the key gaps as found in the empirical literature is a very little contribution is provided for exploring the dynamic role of e-service usefulness in providing higher level of citizen satisfaction towards e-government services. Based on the above literature, Figure 1 shows the theoretical framework of the study.



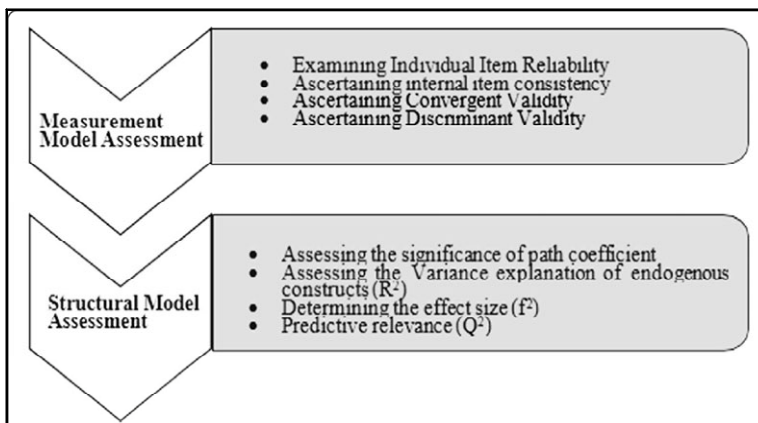
### **3 Research methodology**

A clear and accurate identification of targeted population is a preliminary step for data collection because result's authenticity and generalisability largely depend on this (Sekaran and Bougie, 2016). The population of current research are the citizens of the UAE who are using the E-GOVT services. Therefore, all the individuals in the region of UAE are observed as targeted population due to the fact that they are directly or indirectly receiving different types of governmental services through e-facility. As the data has collected from the individuals, therefore the unit of analysis of the study is individual. Taking sample or selected of the populations, observations on the selected populations and simplifying the findings from the selected population means sampling (Burns et al., 2000). The selected sample of the populations was people using smart on e-Services offered by the governments of UAE. Since the number of users/populations in UAE is big, so it is hard to collect and analyses data from each government smart and e-Services due to time constrains, accessing to each people, budgets as well as other constrains. However, the selection of small populations would allow researchers the ability to have more detailed outcomes, with ample time for data collection and analysis. There are two forms of sampling procedure, according to Saunders et al. (2012). It is worth noting that a study can use both probability and non-probability sampling strategies when determining which is best. In the case of probability sampling (Sekaran and Bougie, 2016). While, in the non-probability population probability is not known and non-probability sampling include the convenience sampling, quota sample and snowball sample (Sekaran and Bougie, 2016). Among of these techniques this research followed convenience sampling for the following reasons. The sample of available participants could be easily assessed. Also, less time, money effort money and simple to collect. Also, since the study about the smart and e-Services users, we are on 21 centuries and the study conducted in UAE where majority of the people are internet users. In addition to that it is more relevant the research aim.

In addition, sample size can be defined after selecting the sampling method, where the size of the sample enough to answer the research questions, meeting the aim and objectives, as well as significant populations representative (Collis and Hussey, 2014). Thus, the study should overcome and select sample which reflect the populations of the study in order to oversimplify the results of the collected data the research must choose sample size to reflect the population. According to Collis and Hussey (2014), small size of the sample may will be a barrier on the data analysis as well as to quantify the defined hypothesis and factors. A questionnaire was developed based on the each of the study variables and distributed among the various citizens who were utilising the e-government facility. Meanwhile, for collecting a sample of 500 respondents from the general public of UAE, a random selection was made from different individuals from different areas of UAE with the help of five team members. With the help of stated teammates, every single respondent of the questionnaire was given a comprehensive information regarding the purpose and objective of data collection based on the study framework. Meanwhile, a time slot of 10 minutes was suggested to the respondents so that they can easily provide the relevant feedback based on the study items. After receiving all the distributed copies among the targeted respondents, a detailed review for every single questionnaire was conducted with the help of teammates. It is observed that out of 500, almost 27% questionnaires (136) were not properly filled by the respondents, having missed with responses in the questionnaire. Therefore, all those copies were dropped from the final

and valid sample. In this regard, we have achieved a sample valid response rate of 72.8% which is considered as good enough for the purpose of descriptive and inferential statistics. This valid sample response rate consisted of 364 questionnaires. Lastly, for the purpose of analysis, this study applies two step approach which is based on measurement model assessment and structural model assessment. More specifically, it is observed that existing body of literature has provided enough evidence to state that two step approach is good enough for the purpose of empirical analysis and hypotheses testing (Hameed et al., 2018). More specifically, under two step approach different estimation indices have been observed for which a detailed description is given under Figure 2 of the study. It is observed that measurement model is based on the examination of individual item reliability, internal item consistency, convergent validity, and discriminant validity of the outer model which is also known as measurement model assessment (Hair et al., 2012, 2013, 2016). On the other side, the inner model assessment, or assessment of structural model is based on the different indices like examining the path coefficients, explained variation in the main endogenous construct, effect size, and predictive relevance, respectively (Hair et al., 2012, 2013, 2016).

**Figure 2** Two-step approach



Source: Hameed et al. (2018)

## 4 Analysis and discussion

### 4.1 Convergent validity

In accordance with the rule of thumb, defined by Fornell and Larcker (1981) and advocated by the recent literature [Hair et al., 2014a, 2014b, 2014c; (2016), p.119], average variance extracted (AVE) was used as a determinant of convergent validity. Table 1 shows the AVE values of all the constructs, which reveal that all the values are above the acceptable threshold of 0.5 (Fornell and Larcker, 1981; Hair et al., 2017), ranging from 0.65 to 0.74. The AVE value greater than 0.5 implies that the latent construct explains more than half of the indicators' variance [Hair et al., (2017), p.114].

**Table 1** Factor loading, Cronbach's alpha, CR, and AVE of latent variables

<i>Construct name</i>	<i>Item</i>	<i>Loading</i>	<i>C-alpha</i>	<i>CR</i>	<i>AVE</i>	<i>Deleted</i>
Citizen satisfaction to e-govt services	EGS1	0.754	0.825	0.884	0.657	
	EGS2	0.816				
	EGS3	0.868				
	EGS4	0.801				
E-govt service continuance intention	ESCI1	0.844	0.800	0.882	0.714	
	ESCI2	0.913				
	ESCI3	0.773				
E-service ease of use	ESEU1	0.818	0.850	0.896	0.682	
	ESEU2	0.871				
	ESEU3	0.836				
	ESEU4	0.777				
E-service quality	ESQ1	0.888	0.941	0.949	0.702	2
	ESQ2	0.846				
	ESQ3	0.832				
	ESQ5	0.750				
	ESQ6	0.889				
	ESQ7	0.845				
	ESQ8	0.832				
	ESQ9	0.812				
	E-service usefulness	ESU1				
ESU2		0.843				
ESU3		0.727				
ESU4		0.725				
Information awareness	IW1	0.807	0.834	0.897	0.743	
	IW2	0.891				
	IW3	0.886				

Notes: ESEU = e-service ease of use, ESU = e-service usefulness, ESQ = e-service quality, ET = online trust, EGS = citizen satisfaction to e-govt services, ESCI = e-govt service continuance intention.

In line with [Hair et al., (2017), p.114], the parameter estimates and statistical significance of all the Five constructs illustrate that all the selected constructs are valid to measure the latent variables, i.e., e-service ease of use, e-service usefulness, information awareness, e-service quality, online trust, citizen satisfaction to e-govt services, e-govt service continuance intention. Hence, all the constructs in the study under focus have an adequate level of convergent validity. In the final step, the correlation between the indicators and latent constructs were assessed to find the absolute contribution of indicators in their respective latent constructs. Results presented in Table 1, indicate that all items have a significant correlation with their corresponding latent constructs.

Loading and cross loadings of the variables that involve in this study are examined by the researcher to identify the problems that serves as pre-requisite for outer model. As

discussed above the measurement model was assessed to insure the model reliability and validity in the assessment of measurement model. The construct of all variables that were used in this study are adopted from the previous studies, (also discussed earlier in detail in Section 3). Therefore, in this study the author undertook only confirmatory factor analysis by using the Smart PLS 3.3.2 (Henseler et al., 2017). Align with the Hair et al. (2010) recommendations where minimum requirement of sample size is 150 to perform a confirmatory factor analysis, whereas, the sample size of this study was 364.

In line with the criteria suggested by the Hair et al. (2014a, 2010) convergent validity is attained by meeting the criteria that factor loading of each item is above than 0.7 and no loading of any item from other construct have higher loading than the one which think to measure. The results of this study in terms of convergent validity revealed that three items were less than 0.7. that three items (ESQ4, ESQ10, and ET5) were deleted out of 33 due to lower factor loading that were not fulfilling the lowest criteria. Thus, in the whole model, 30 items are retained because they fulfil the basic requirement of convergent validity, and that all items have loading between 0.72 to 0.91 that are shown in Table 1.

#### 4.2 *Multicollinearity test*

Multicollinearity test describes the statistical phenomenon in which two or more independent variables in multiple regression models are highly correlated (Sekaran and Bougie 2013). The presence of multicollinearity among the exogenous latent construct could considerably misrepresent the estimates of regression coefficients and their statistical significance (Cooper and Schindler, 2011; Hair et al., 2006). One of the major problems of multicollinearity is indicating significant relationship when in reality the relationship is not significant and it increases the standard error of the coefficient, which in turn render the coefficient statistically non-significant (Hair et al., 2007; Tabachnick and Fidell, 2007).

**Table 2** Tolerance and VIF

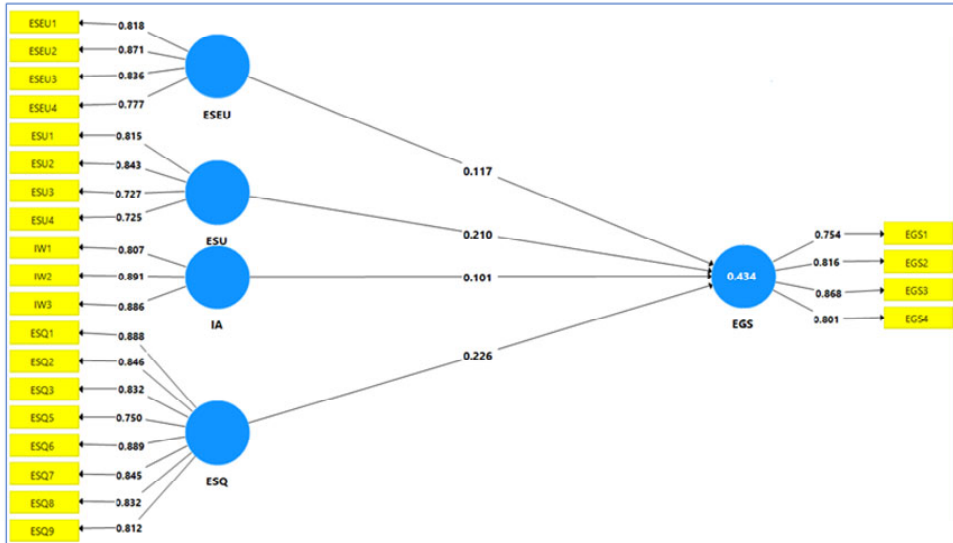
<i>Latent construct</i>	<i>Tolerance</i>	<i>VIF</i>
E-service ease of use	0.391	2.557
E-service usefulness	0.756	1.323
Information awareness	0.877	1.140
E-service quality	0.366	2.733
Online trust	0.618	1.618
E-govt service continuance intention	0.906	1.103

Note: Dependent construct: citizen satisfaction to e-govt service.

This study used variance inflation factors (VIF) method to check for multicollinearity problem in line with the recommendation of Peng and Lai (2012). First, exogenous latent construct correlation matrix was determined to see whether the correlation coefficient was at least 0.90 which indicate Multicollinearity problem as suggested by Hair et al. (2014a). Second, the evaluation of the correlation matrix for VIF which is the extent to which the standard error is enhanced as the outcome of collinearity issue. Moreover, tolerance value was also tested to determine whether there was a multicollinearity problem. Hair et al. (2014a), recommends that tolerance value equal or less than 0.20 and

VIF value more than 5 demonstrates that there is a multicollinearity problem. Table 2 demonstrates that tolerance value more than 0.20 and VIF less than 5. Hence, there is no issue of multicollinearity as presented in Table 2.

**Figure 3** Measurement model output (see online version for colours)



### 4.3 Direct relationships of the structural model

This section addresses the dependency of the relationship in the hypothesising study model, according to the assessment of the direct relationship of the measurement model, as indicated by Hair et al. (2006). The findings for the direct relationships are provided under Table 3. In PLS, structural modelling PLS analyses the direct connection between the study constructs and their t values, as compared to trajectory coefficients, internally. The path coefficient is the same as the normal beta coefficient for regression analysis, as argued by Henseler et al., (2015). Where beta values of regression coefficient and t-values are tested to assess their significance. In line with Hair et al. (2014c) rule of thumb, t-value more than 1.967 is deemed acceptable and used further for decision-making on the purpose.

Firstly, the fundamental objective of this research is to concentrate on the model assessment by analysing the direct connections with the dependent variable such as e-service ease of use, e-service usefulness, information awareness, e-service quality, online trust, toward citizen satisfaction to e-govt services, and citizen satisfaction to e-govt services and secondly, test the hypothesised relationships among the constructs through structural model. Table 2 explains the direct effect of every latent variable on the dependent variable, Figure 3 also shows a detailed result of the Smart-PLS 3.3.2, which demonstrates the path coefficient value, t-values, p-values and standard error. The theory was accepted or not endorsed by the investigator based on these fundamental principles. Bootstrapping is a proxy for the empirical standard error parameters, as argued by Hair et al. (2010), and with 500 sampling iterations for 364 observation cases.

The results of the study show that five hypotheses of the direct relationship with citizen satisfaction to e-govt services are proven to be significant. For instance, H1 results shows that e-service usefulness has positive and significant association with citizen satisfaction to e-govt services as structural model results reported (beta = 0.124, t-statistics = 2.799, and p-value 0.005). H2 results also found significant which shows significant negative relationship between e-service ease of use and citizen satisfaction to e-govt services, as the results reported that (beta = 0.150, t-statistics = 2.635, and p-value 0.009). H3 results also expose the negative relationship between the information awareness and citizen satisfaction to e-govt services as structural model reported that (beta = -0.114, t-statistics = 2.545, and p-value 0.011). H4 testing also reported that significant positive association amongst the e-service quality and citizen satisfaction to e-govt services as structural model results reported (beta = -0.182, t-statistics = 3.164, and p-value 0.002). in the same vein, H5 testing also reported that significant positive association amongst the online trust and citizen satisfaction to e-govt services as structural model results reported (beta = -0.344, t-statistics = 6.631, and p-value 0.000).

**Table 3** Direct relationship results

<i>H</i>	<i>Path</i>	<i>Beta</i>	<i>STDEV</i>	<i>T statistics</i>	<i>P values</i>	<i>Decision</i>
H1	ESU -> EGS	0.124	0.044	2.799	0.005	Not supported
H2	ESEU -> EGS	0.150	0.057	2.635	0.009	Supported
H3	IA -> EGS	0.114	0.045	2.545	0.011	Supported
H4	ESQ -> EGS	0.182	0.057	3.164	0.002	Supported
H5	ET -> EGS	0.344	0.054	6.313	0.000	Supported

Notes: ESEU = e-service ease of use, ESU = e-service usefulness, IW = information awareness, ESQ = e-service quality, ET = online trust, EGS = citizen satisfaction to e-govt services.

Based on the results, one of the major significant predictors of citizen satisfaction to e-govt services found is e-service usefulness. As the results reported that e-service usefulness has more effects in prediction of citizen satisfaction to e-govt services among the citizens of the UAE (beta = 0.124, t-statistics = 2.799, and p-value 0.005) as compared to other predictors. The hypothesis 1, that e-service usefulness is positively correlated to citizen satisfaction to e-govt services is discovered to be significant and supported. The findings are harmonious with prior studies that e-service usefulness has an essential role to form citizen satisfaction to e-govt services as it increases citizen's intention to use E-Service by playing a role as a facilitator (Tsui, 2019). Moreover, the results of this study also supported by the argument given by Chen and Aklikokou (2020), that e-service usefulness increases the likelihood of using an online govt service that is when citizen's perceived the online service is useful for them and bring the solution of their problems which ultimately leads citizens toward citizen satisfaction to e-govt services. In other words, the e-service usefulness enhances citizen satisfaction to e-govt services it can be said that e-service usefulness induces consumers to Satisfy while using e-govt services.

Based on the results, one of the major significant predictors of citizen satisfaction to e-govt services found is e-service ease of use. As the results reported that e-service ease of use has more effects in prediction of citizen satisfaction to e-govt services among the citizens of the UAE (beta = 0.124, t-statistics = 2.799, and p-value 0.005) as compared to

other predictors. The Hypothesis 2, that e-service ease of use is positively correlated to citizen satisfaction to e-govt services is discovered to be significant and supported. The findings are harmonious with prior studies that e-service ease of use has an essential role to form citizen satisfaction to e-govt services as it increases citizen's intention to use e-service by playing a role as a facilitator (Chen and Aklikokou, 2020). Moreover, the results of this study also supported by the argument given by ElKhashin and Saleeb (2020), that e-service ease of use increases the likelihood of using an online Govt service that is when citizen's perceived the online service is useful for them and bring the solution of their problems which ultimately leads citizens toward citizen satisfaction to e-govt services. It serves as a tool to increase the satisfaction among the citizens such that when a service is designed in a way that it offers the citizens with ease to use, learn and adopt to the system easily and doing any task or availing the service is also easier than it will result in increased satisfaction. In sum when the tasks are made easier as compared to perform them manually then it will result in increased satisfaction among the citizens (Nguyen et al., 2019).

The hypothesis H3, that information awareness is positively correlated to citizen satisfaction to e-govt services is discovered to be significant and supported. As the results reported that information awareness has more effects in prediction of citizen satisfaction to e-govt services among the citizens of the UAE (beta = -0.114, t-statistics = 2.545, and p-value 0.011). This is because, the handling of such ICT systems requires basic knowledge to operate and access. On the other hand, with respect to the process of acquiring services, Palaco et al. (2019) argues that besides having the basic ICT skills, each service system is different. This means that the users require the right set of knowledge on how to operate and use such service platforms. The study outcome favours previous researches such as Khan et al. (2012) and Torres et al. (2005). This means that the users require the right set of knowledge on how to operate and use such service platforms to achieve their own satisfaction levels, besides relying on the government support and contributions. Baharon et al. (2017), hence, therefore, that information awareness positively influences the satisfaction among the citizens using e-govt. services.

The hypothesis H4, that e-service quality is positively correlated to citizen satisfaction to e-govt services is discovered to be significant and supported. As the results reported that e-service quality has more effects in prediction of citizen satisfaction to e-govt services among the citizens of the UAE (beta = -0.182, t-statistics=3.164, and p-value 0.002). Hence, the findings of the study in H4 have collaborated with prior studies of Alalwan et al. (2016). Using these results, it can be concluded that the reason of significant result could be that individuals are more likely to use online services of the UAE Government as they perceive service quality of the services provided is per the expectations. Furthermore, this study in line with previous studies of Skordoulis et al. (2017) which found the e-service quality is positively correlated to citizen satisfaction to e-govt services.

The hypothesis H5, that online trust is positively correlated to citizen satisfaction to e-govt services is discovered to be significant and supported. As the results reported that online trust has positive effects in prediction of citizen satisfaction to e-govt services among the citizens of the UAE (beta = -0.344, t-statistics = 6.631, and p-value 0.000). As per the expectations, the results proves that online trust significantly influence the citizen satisfaction to e-govt services. These results are also in line with the prior study of (Kurfalı et al., 2017), that online trust is positively correlated to citizen satisfaction to e-govt services. Using these results, it can be concluded that trust is the most significant

factor to form the citizen satisfaction of the govt services. The result discussed above also supported by the arguments of previous authors such as, Kurfalı et al. (2017) argued that when governments ensure the trust regarding the economic, personal and medical data security it builds trust among the citizens to communicate through the applications provided to them by the government institutions. Kim et al. (2009) conducted a longitudinal research in the USA and found that trust is very vital for the success of online systems and for loyalty of customers. Trust in e-government context ensures that citizen's trust on the technology based government services that reduce their perceptions of risk associated with using the e-government services (Bélanger and Carter, 2008). In the present study context trust is defined as the citizen's willingness of dependence of the e-government services provided by the government for their transactions backed by the belief of assurance and confidence.

## **5 Conclusions**

From the empirical results of this study, it is observed that e-service usefulness increased the citizen satisfaction to e-govt services in the UAE and results in increasing e-govt service continuance intention. The study findings also depicted that when a citizen feel the service useful for the resolution of their problems then his/her status of satisfaction tends to increase. Consistent with the findings of the study it is stated that the e-service govt-organisations of UAE must look at their mandatory services to prevent situations where citizens feel complexity and issues in e-govt service delivery through websites and portals. It is no exception that organisations, particularly govt-organisations have issues, but they can be controlled so they do not make the e-govt service facilities useless and time consuming than the traditional ones. In this regard, it is recommended that organisations need to take serious steps to put efforts to make their e-services efficient and effective than past. Additionally, it is worthy to note that service usefulness in the TAM widely acknowledged that by the researchers to achieve the target audience favour, either they are e-customers or citizens in case of the govt services.

This study also carries various theoretical implications which highlights its theoretical significance and contribution to existing literature. First, the study has considered multiple predictors of citizen satisfaction to e-govt services from different aspects. While doing so the study has highlighted the importance and contribution of different factors associated with citizen satisfaction to e-govt services. Studying the multiple predictors of citizen satisfaction to e-govt services added new empirical insights to the existing literature. One of the major contributions of the study lies in the fact that it has predicted citizen satisfaction to e-govt services from a TAM perspective. This contribution seems to be more important when it comes to the study point that it has considered the direct relationships between the e-service ease of use, e-service usefulness, information awareness, e-service quality, online trust, citizen satisfaction to e-govt services.

## **6 Limitations and future research**

Though the research in hand has accomplished its objectives and presented significant results, still some limitations need to be addressed in future studies. The very first limitation lies in the cross-sectional research design. Alike other researchers, the cross-



sectional research design is adopted to save time and a productive method to examine the research hypotheses. Anyhow, it is criticised for its one-time data collection and absence of temporal precedence. It establishes that the time-order sequence cannot be established in such a research design (Shadish et al., 2002). Meanwhile, another limitation of the study lies in the method of data collection. Since the study has used the self-rated survey questionnaire for data collection, which affirms that there may be some sort of response bias among respondents even though the required tests are also performed to identify such issue. Furthermore, the findings through structural model assessment are well presented, however, some measures like explained variation in the main endogenous construct, analysing the predictive relevance, and effect size are not added under present study. Based on the above limitations, it is suggested that future studies must consider the different data collection approaches such as they can use the e-govt service provider's ratings, or they can have interviews for data collection. Accordingly, future studies are also recommended to adopt the longitudinal research design so that difference at two-time intervals can be assessed for citizen satisfaction to e-govt services. Additionally, longitudinal research design will also assist to mark any increase or decrease in any of the factors under study. Finally, the discussion related to predictive relevance of the model, explained variation in the main dependent variable, and effect size should also be considered in the upcoming studies.

## References

- Ahmad, S., Bhatti, S.H. and Hwang, Y. (2020) 'E-service quality and actual use of e-banking: explanation through the technology acceptance model', *Information Development*, Vol. 36, No. 4, pp.503–519.
- Akbari, M., Mokhtari, H., Moradi, A., Pourjam, A. and Khosravani, A. (2020) 'Service innovation and firm performance: operational experiences in uncertain environments', *International Journal of Services, Economics and Management*, Vol. 11, No. 4, pp.347–370, DOI: 10.1504/IJSEM.2020.111932.
- Alalwan, A.A., Dwivedi, Y.K., Rana, N.P. and Williams, M.D. (2016) 'Consumer adoption of mobile banking in Jordan: examining the role of usefulness, ease of use, perceived risk and self-efficacy', *Journal of Enterprise Information Management*, Vol. 29, No. 1, pp.118–139.
- AlAwadhi, S. (2019) 'A proposed model of trust factors for e-government adoption and civic engagement', *Proceedings of the 52nd Hawaii International Conference on System Sciences*, University of Hawai'i at Manoa, pp.3161–3170.
- Al-Kaseasbeh, H.M., Harada, Y. and Saraih, U. (2019) 'E-government services assessment from the perspective of citizens interaction and satisfaction in Jordan: pilot study', *International Journal of Research and Review*, Vol. 6, No. 12, pp.50–56.
- Alkraiji, A. and Ameen, N. (2021) 'The impact of service quality, trust and satisfaction on young citizen loyalty towards government e-services', *Information Technology People*, <https://doi.org/10.1108/ITP-04-2020-0229>.
- Al-Momani, K. and Mohd Noor, N.A. (2009) 'E-service quality, ease of use, usability and enjoyment as antecedents of e-CRM performance: an empirical investigation in Jordan mobile phone services', *The Asian Journal of Technology Management*, Vol. 2, No. 2, pp.50–64.
- AlSayegh, A., Hossan, C. and Slade, B. (2019) 'Radical improvement of e-government services in Dubai', *International Journal of Services Technology Management*, Vol. 25, No. 1, pp.53–67.
- Anwer, M.A., Esichaikul, V., Rehman, M. and Anjum, M. (2016) 'E-government services evaluation from citizen satisfaction perspective: a case of Afghanistan', *Transforming Government: People, Process and Policy*, Vol. 10, No. 1, pp.139–167.

- Baharon, B.M., Yap, C.S., Ashar, S.F.E., Hanafi, M.H.H.M. and Hazmi, M.S.R.M. (2017) 'Citizen satisfaction with e-government portals in Malaysia', *International Journal of Business & Information*, Vol. 12, No. 3, pp.289–309.
- Bélanger, F. and Carter, L. (2008) 'Trust and risk in e-government adoption', *The Journal of Strategic Information Systems*, Vol. 17, No. 2, pp.165–176.
- Burns, P.N., Wilson, S.R. and Simpson, D.H. (2000) 'Pulse inversion imaging of liver blood flow: improved method for characterizing focal masses with microbubble contrast', *Investigative Radiology*, Vol. 35, No. 1, pp.58–71.
- Butt, N., Warraich, N.F. and Tahira, M. (2019) 'Development level of electronic government services', *Global Knowledge, Memory and Communication*, Vol. 68, Nos. 1–2, pp.33–46.
- Chen, L. and Aklikokou, A.K. (2020) 'Determinants of e-government adoption: testing the mediating effects of perceived usefulness and perceived ease of use', *International Journal of Public Administration*, Vol. 43, No. 10, pp.850–865.
- Collis, J. and Hussey, R. (2014) *Business Research*, 4th ed., Palgrave Macmillan, Basingstoke.
- Cooper, D.R. and Schindler, P.S. (2011) *Business Research Methods*, 11th ed., McGraw-Hill, New York.
- Davis, F.D. (1989) 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly*, Vol. 13, No. 3, pp.319–340.
- Demir, A., Maroof, L., Khan, N.U.S. and Ali, B.J. (2020) 'The role of e-service quality in shaping online meeting platforms: a case study from higher education sector', *Journal of Applied Research in Higher Education*, <https://doi.org/10.1108/JARHE-08-2020-0253>.
- Duggett, M. (1998) 'New developments in public administration: country report citizen's charter: people's charter in the UK', *International Review of Administrative Sciences*, Vol. 64, No. 2, pp.327–330.
- EiKheshin, S.A. and Saleeb, N. (2020) 'Assessing the adoption of e-government using tam model: case of Egypt', *International Journal of Managing Information Technology*, Vol. 12, No. 1, pp.1–14.
- Featherman, M.S. and Pavlou, P.A. (2003) 'Predicting e-services adoption: a perceived risk facets perspective', *International Journal of Human-computer Studies*, Vol. 59, No. 4, pp.451–474.
- Flynn, N. (2012) *Public Sector Management*, Sage Publications, Thousand Oaks, California.
- Fornell, C. and Larcker, D. F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, Vol. 18, No. 1, pp.39–50.
- Fyfe, N.R. (1993) 'Making space for the citizen?: The (In) significance of the UK citizen's charter', *Urban Geography*, Vol. 14, No. 3, pp.224–227.
- Greener, I. (2012) *Public Management*, Macmillan International Higher Education, London.
- Hackbarth, G., Grover, V. and Mun, Y.Y. (2003) 'Computer playfulness and anxiety: positive and negative mediators of the system experience effect on perceived ease of use', *Information & Management*, Vol. 40, No. 3, pp.221–232.
- Hair, J., Sarstedt, M., Ringle, C.M. and Gudergan, S.P. (2017) *Advanced Issues in Partial Least Squares Structural Equation Modeling*, Sage Publications, Thousand Oaks, California.
- Hair, J.F., Anderson, R.E., Babin, B.J. and Black, W.C. (2010) *Multivariate Data Analysis: A Global Perspective*, Vol. 7, Pearson, Upper Saddle River, NJ.
- Hair, J.F., Arthur, H.M., Samouel, P. and Page, M. (2007) *Research Methods for Business*, John Wiley and Sons, Chichester.
- Hair, J.F., Black, W., Babin, B. and Anderson, R. (2014a) *Multivariate Data Analysis*, Pearson New Internat. ed., Pearson, Harlow.
- Hair, J.F., Hult, G.T.M., Ringle, C. and Sarstedt, M. (2014b) *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage Publications, Thousand Oaks, California.
- Hair, J.F., Sarstedt, M., Hopkins, L. and Kuppelwieser, V.G. (2014c) *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage Publications, Thousand Oaks, California.

- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2006) *Multivariate Data Analysis*, Vol. 6, Pearson Prentice Hall, Upper Saddle River, NJ.
- Hair, J.F., Hult, G.T.M., Ringle, C. and Sarstedt, M. (2016) *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage Publications, Thousand Oaks, CA.
- Hair, J.F., Ringle, C.M. and Sarstedt, M.J.L.r.p. (2013) 'Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance', *Long Range Planning*, Vol. 46, Nos. 1–2, pp.1–12.
- Hair, J.F., Sarstedt, M., Ringle, C.M. and Mena, J.A. (2012) 'An assessment of the use of partial least squares structural equation modeling in marketing research', *Journal of the Academy of Marketing Science*, Vol. 40, No. 3, pp.414–433.
- Hameed, W.U., Basheer, M.F., Iqbal, J., Anwar, A. and Ahmad, H.K. (2018) 'Determinants of firm's open innovation performance and the role of R&D department: an empirical evidence from Malaysian SME's', *Journal of Global Entrepreneurship Research*, Vol. 8, No. 1, pp.1–20.
- Haseeb, M., Zandi, G., Hartani, N.H., Pahi, M.H. and Nadeem, S. (2019) 'Environmental analysis of the effect of population growth rate on supply chain performance and economic growth of Indonesia', *Ekoloji Dergisi*, Vol. 28, No. 107, pp.417–426.
- Henseler, J., Hubona, G. and Ray, P.A. (2017) 'Partial least squares path modeling: updated guidelines', in *Partial Least Squares Path Modeling*, pp.19–39, Springer, NY.
- Henseler, J., Ringle, C.M. and Sarstedt, M. (2015) 'A new criterion for assessing discriminant validity in variance-based structural equation modeling', *Journal of the Academy of Marketing Science*, Vol. 43, No. 1, pp.115–135.
- Khan, G.F., Moon, J., Swar, B., Zo, H. and Rho, J.J. (2012) 'E-government service use intentions in Afghanistan: technology adoption and the digital divide in a war-torn country', *Information Development*, Vol. 28, No. 4, pp.281–299.
- Kim, S., Kim, H.J. and Lee, H. (2009) 'An institutional analysis of an e-government system for anti-corruption: the case of OPEN', *Government Information Quarterly*, Vol. 26, No. 1, pp.42–50.
- Kumar, A. and Dash, M.K. (2015) 'Effectiveness of electronic service dimensions on consumers' electronic buying behaviour and exploration of different groups', *International Journal of Business Innovation Research*, Vol. 9, No. 1, pp.81–99.
- Kurfalı, M., Arifoğlu, A., Tokdemir, G. and Paçın, Y. (2017) 'Adoption of e-government services in Turkey', *Computers in Human Behavior*, Vol. 66, pp.168–178.
- Mensah, I.K., Jianing, M. and Durrani, D.K. (2017) 'Factors influencing citizens' intention to use e-government services: a case study of South Korean students in China', *International Journal of Electronic Government Research*, Vol. 13, No. 1, pp.14–32.
- Nguyen, T.T.H., Nguyen, N., Nguyen, T.B.L., Phan, T.T.H., Bui, L.P. and Moon, H.C. (2019) 'Investigating consumer attitude and intention towards online food purchasing in an emerging economy: an extended tam approach', *Foods*, Vol. 8, No. 11, p.576, <https://doi.org/10.3390/foods8110576>.
- Norris, D.F. and Reddick, C.G. (2013) 'Local e-government in the United States: transformation or incremental change?', *Public Administration Review*, Vol. 73, No. 1, pp.165–175.
- Oliveira, T., Faria, M., Thomas, M.A. and Popović, A. (2014) 'Extending the understanding of mobile banking adoption: when UTAUT meets TTF and ITM', *International Journal of Information Management*, Vol. 34, No. 5, pp.689–703.
- Page, A. (1999) 'The citizen's charter and administrative justice', in Harris, M. and Partington, M. (Eds.): *Administrative Justice in the 21st Century*, pp.85–98, Hart, Oxford.
- Palaco, I., Park, M.J., Kim, S.K. and Rho, J.J. (2019) 'Public-private partnerships for e-government in developing countries: an early stage assessment framework', *Evaluation and Program Planning*, Vol. 72, pp.205–218.

- Papathanasiou, N. and Adey, B.T. (2020) 'Usefulness of quantifying effects on rail service when comparing intervention strategies', *Infrastructure Asset Management*, Vol. 7, No. 3, pp.167–189.
- Peng, D.X. and Lai, F. (2012) 'Using partial least squares in operations management research: a practical guideline and summary of past research', *Journal of Operations Management*, Vol. 30, No. 6, pp.467–480.
- Psomas, E., Bouranta, N., Koemtzi, M. and Keramida, E. (2020) 'Determining the impact of service quality on citizens' satisfaction and the role of citizens' demographics. The case of the Greek citizen's service centers', *The TQM Journal*, DOI: <https://doi.org/10.1108/TQM-12-2019-0274>.
- Sahib, U. (2015) 'M-governance: smartphone applications for smarter cities – tapping GPS and NFC technologies', in *E-Governance for Smart Cities*, pp.245–306, Springer, NY.
- Samuel, N., Onasanya, S. and Olumori, C. (2018) 'Perceived usefulness, ease of use and adequacy of use of mobile technologies by Nigerian university lecturers', *International Journal of Education and Development using Information and Communication Technology*, Vol. 14, No. 3, pp.5–16.
- Santos, J. (2003) 'E-service quality: a model of virtual service quality dimensions', *Managing Service Quality: An International Journal*, Vol. 13, No. 3 pp.233–246.
- Saunders, M., Lewis, P. and Thornhill, A. (2012) 'Selecting samples', in *Research Methods for Business Students*, 5th ed., pp.214–243, Prentice Hall, Harlow, England.
- Schedler, K. and Proeller, I. (2002) 'The new public management: a perspective from mainland Europe', in McLaughlin, K. (Ed.): *New Public Management: Current Trends and Future Prospects*, pp.S.163–180, Routledge, London.
- Sekaran, U. and Bougie, R. (2016) *Research Methods for Business: A Skill Building Approach*, John Wiley & Sons, NJ.
- Shadish, W.R., Cook, T.D. and Campbell, D.T. (2002) *Experimental and Quasi-experimental Designs for Generalized Causal Inference*, Houghton-Mifflin, Boston, MA.
- Skordoulis, M., Alasonas, P. and Pekka-Economou, V. (2017) 'E-government services quality and citizens' satisfaction: a multi-criteria satisfaction analysis of TAXISnet information system in Greece', *International Journal of Productivity and Quality Management*, Vol. 22, No. 1, pp.82–100.
- Tabachnick, B. and Fidell, L. (2007) *Using Multivariate Statistics*, 5th ed., Allyn & Bacon/Pearson Education, Boston.
- Tan, C.W. and Benbasat, I. (2009) 'IT mediated customer services in e-government: a citizen's perspective', *Communications of the Association for Information Systems*, Vol. 24, No. 1, pp.1–12.
- Thomassen, J-P., Ahaus, K., Van de Walle, S. and Nabitz, U. (2014) 'An implementation framework for public service charters: results of a concept mapping study', *Public Management Review*, Vol. 16, No. 4, pp.570–589.
- Ting, H., Tan, K-L., Lim, X-J., Cheah, J-H., Ting, Q-H. and Ting, H-B. (2020) 'What determines customers' loyalty towards telecommunication service? Mediating roles of satisfaction and trust', *International Journal of Services, Economics and Management*, Vol. 11, No. 3, pp.234–255, DOI: 10.1504/IJSEM.2020.111179.
- Torres, L., Pina, V. and Royo, S. (2005) 'E-government and the transformation of public administrations in EU countries: beyond NPM or just a second wave of reforms?', *Online Information Review*, Vol. 29, No. 5, pp.531–553.
- Tsui, H-D. (2019) 'Trust, perceived useful, attitude and continuance intention to use e-government service: an empirical study in Taiwan', *IEICE Transactions on Information and Systems*, Vol. 102, No. 12, pp.2524–2534.

- Upadhyay, A.K., Khandelwal, K., Nandan, T. and Mishra, P. (2018) 'Sales technology usage: Modeling the role of support service, peer usage, perceived usefulness and attitude', *Asia Pacific Journal of Marketing Logistics*, Vol. 30, No. 1, pp.257–271, <https://doi.org/10.1108/APJML-01-2017-0001>.
- Van de Walle, S. (2018) 'Explaining citizen satisfaction and dissatisfaction with public services', *The Palgrave Handbook of Public Administration Management in Europe*, pp.227–241.
- Venkatesh, V. and Davis, F.D. (2000) 'A theoretical extension of the technology acceptance model: Four longitudinal field studies', *Management Science*, Vol. 46, No. 2, pp.186–204.
- Wadjdi, F. and Djamin, Z. (2021) 'The relationship between e-service quality and ease of use on electronic customer relationship management (E-CRM) performance mediating by brand image', *Asian Journal of Economics, Business and Accounting*, Vol. 21, No. 4, pp.9–19, <https://doi.org/10.9734/ajeba/2021/v21i430367>.
- Wang, H. (2018) *The Effects of Social Support and Coping Strategies on Job Stress and Burnout*, 13 April, SSRN [online] <https://ssrn.com/abstract=3161858> or <http://dx.doi.org/10.2139/ssrn.3161858>.
- Wang, H. and Liu, Z. (2020) *Identifying the Antecedents of Internal Integrations in Improving Green Product Innovation*, 16 January, SSRN [online] <https://ssrn.com/abstract=3520795> or <http://dx.doi.org/10.2139/ssrn.3520795>.
- Wei, J. (2014) *Mobile Electronic Commerce: Foundations, Development, and Applications (Industrial and Systems Engineering)*, CRC Press, Boca Raton, FL.
- Wu, T-H., Weng, S-J., Pan, R-B., Kim, S-H., Gotcher, D. and Tsai, Y-T. (2020) 'Exploring service quality combining Kano model and importance-performance analysis – customer satisfaction of luxury housing service management', *International Journal of Services, Economics and Management*, Vol. 11, No. 1, pp.71–95.