Exploring Citizen's Expectation of Smart Government Services in United Arab Emirates (UAE)

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Abstract*— The study investigated the factors that determine citizens' expectations of smart government services in UAE. A survey method was used to collect data from 392 respondents. The data was analyzes using descriptive statistics (mean, standard deviation and Relative Importance Index) and analysis of variance (ANOVA). The result revealed six factors that influence citizens' expectations of smart government services: openness, responsiveness, transparency, trust, participation, and usability. It was found that all these factors are rated highly by the respondents, with transparency and trust being the most important ones. Furthermore, it was found that there is no significant difference in the expectations of smart government services across different age groups of respondents. It is recommended that smart government services should be designed and delivered in a way that meets the high expectations of citizens and enhances their satisfaction and trust.

Keywords—Smart government, citizen's expectation, smart government services.

I. INTRODUCTION

The concept of smart government, also known as e-government or e-democracy, connotes the use of new communication channels for citizens. It involves the use of innovative information and communication technologies (ICT) in the delivery of government services to citizens (Demirel, & Mülazımoğlu, 2022). The concept emphasizes citizens' participation in decision-making processes of government.

Smart governance is a relatively new idea whose adoption is heavily dependent on the country's natural and social resources, as well as citizens' awareness of information and communication technology (Weisi and Ping, 2014). Smart government is a complex innovation since its adoption and implementation take a long time, have large operational costs, and are fraught with risk and uncertainty (Yang et al., 2015). As a result, the notion of smart governance is still difficult to implement among public users in emerging countries such as the United Arab Emirates (UAE). Although preparations for the adoption of the smart governments concept in the UAE have begun, execution of this concept is yet inadequate.This makes most smart government studies still focus on problem in the early stages of adoption.

The UAE being one of the top digitally connected countries in the world with an internet penetration rate of 99% and mobile internet user penetration rate of 95.85% (Statistica, 2023) have witnessed the emergence of smart government recently. For instance, a number of smart government apps have been developed, including Abu Dhabi City Guard (Abu Dhabi, 2015), smart Fujairah (Fujairah Municipality, 2015), Abu Dhabi Gateway (Dahi and Ezziane, 2015), and mobile apps for healthcare (Latif et al., 2015). The Abu Dhabi City Guard connects Abu Dhabi residents with several government departments and allows them to report incidents. This assists citizens in their efforts to improve Abu Dhabi's security and general safety. The Abu Dhabi Gateway facilitates government-to-customer and government-to-business transactions. Services such as health, interior affairs, education, and paying traffic fines are made available in real time through these two gateways. The UAE smart government is designed to offer online services and information to all natives, occupants, guests, organizations and other government entities. Some of the key service rendered by the e-government services include application for visas, acquiring driving licenses, getting national identity cards, going about in UAE and other famous eService (Abu-Dhabi, 2019; Telecommunications Regulatory Authority, 2019).

ICT is the regarded as the backbone of smart government. The use of ICT redefines and redesigns traditional forms of process and structural organization, particularly information digitization. It serves several functions, including data collection, data use to make better decisions and improve service delivery, and increased accountability through greater openness (Gil-Garcia, Pardo, and Aldama-Nalda, 2013). Information must be shared, utilized, and integrated into the intelligence and public

acceptance. This has made computer-aided facilities for reuse and sharing a critical issue in smart government integration and interoperability (Alenezi, Tarhini, and Sharma, 2015; Jiménez et al., 2016).

Recently, with the growth of WEB 2.0, social media, which encompasses social networking, blog, wiki, tagging, and crowdsourcing, has been identified as one of the components of smart governance (Criado et al., 2013; Westermen et al., 2014). Social media has been recognized as a method of engaging citizens, improving social consciousness, exchanging perspectives, generating debate, and disseminating information about social and political concerns. Furthermore, smart governments benefit from social media in terms of two-way communication, soliciting creative ideas from the masses, collective input on government services, and increasing openness in government involvement with the public. As a result, social media, as a source of online information, plays an important role in increasing smart government communication.

Through increasing participation and collaboration with the government, social media has the potential to nurture accountability and transparency of governments towards their citizens and stakeholders (Hao, Zheng, Zeng, & Fan 2016). According to the United Nations' 2016 e-government survey, four out of five countries now include social media links in their national web portals. However, government organizations' efforts and the potential benefit of social media for e-government services cannot be demonstrated without addressing citizens' acceptance of such services (Khan, Rahim, & Maarop 2018). Thus, this implies that gaining public trust becomes one of the most urgent issues to cultivate the acceptance of citizens with smart government (Gil-Garcia, 2014). Therefore, the thrust of this paper is to explore the determinants of citizens' expectation of smart government services in the UAE.

II. Literature Review

A. *Overview of smart government*

The term of smart government varies. Gil-Carcia et al., (2014) define smart government as a city, a town and network within political jurisdiction use emerging of information, technology, and innovation in the governing activities to provide better services and to gain a good understanding of their communities. They identified being percipient, being astute, being shrewd, and being quick as the characteristics of a smart government. Further Gil-Garcia et al., (2016) outlines the 13 dimensions of smartness in government. In today's practice ofsmart government there is not one-size-fits all type of smart government. They will make use one or more of the 13 dimensions as their strategies in becoming smarter government. Mellouli, Luna-Reyes and Zhang (2014) identify smart government to improve the life quality by interacting and engaging the public through extensive use of information technologies.

Another smart government definition is identified by Awoleye et al., (2014) in which the government is said to be advanced and people are given opportunity to use, participate and communicate anytime, anywhere with the government through the convergence and integrationof smart IT and government services. This definition is followed by Chen and Lan (2014) and Sangki (2017) who sees information is being utilized to improve the society and shorten the decision-making process as a results of information technology integration. In their findings the society is expected to transform into a value-oriented society in which humans are put first as the purposeful being.

Harsh and Ichalkaranje (2015) refer smart government as extending the concept of e- government to a new level by embracing open data as instrument to transform a government into a more transparent and open government. In the respect of extending the concept of e-government and open government, Jeminez, Falcone, Puyosa, Zoughbi and Gonzalez (2014) stated that the governmentadministrations continually facing new challenges on interoperability issues of big, open and linked data of the back-office element of smart government (such as e-justice, e-health). Similarly, Gartner (2013) added smart government is to take the full advantage of information, communication and operational technologies of all operational areas across multiple domains, process areas and jurisdiction to generate sustainable public value. In Scholl and Scholl (2014)Smart government has to cope with (a) complexity, (b) uncertainty and (c) build competencies and (d) achieve resilience in which the (c) and (d) also been referred to smart governance. Almuqarab (2017) pointed out that smart government requires the acceptance of public on mobile applications-based government services (m-government).

B. *Determine factor influecing citizen's expection troward smart government*

1. Openness

   Openness in this research is referring to the structured and unstructured government datathat is provided to the citizens using free access. These open data can be utilized by third partystakeholders to innovate and add value for public usage. It will become a fuel that makes applications work (Millard, 2011). Giving access to government data will encourage individuals and organizations to develop new insights and innovations that can improve the lives of others and help to improve the flow of information (Cabinet Office, 2013). All government's collected data should be set to "openness by default" unless it contains sensitive information about individuals or organizations. It is important for government to release its data using downloadable features in e-government websites in a format that is easily being crunched. These datasets should be machine readable, categorized or indexed and have a clear meaning of whatit is, where simple and complex tools can be used to manipulate it.

2. Transparency

   Transparency means that government providing information about their operations and decisions for citizens to understand how the process of the government works. A transparent government will promote accountability as both elements are connected in a transformation process (Weerakkody et al., 2011). Having transparent services will benefit boththe demand and supply side of e-government.

Government should provide simple to understand, relevant and honest information for the public to know. On the other hand, by allowing the citizens to see what is going on in their processes, it will enforce their belief that the governmentis serious about trying to transform itself. Egovernment websites is a good medium to promote political transparency in government administration (Chutimaskul, 2003). In designing government e-services, best practices from the private sectors should be adopted, where traceable process gives confidence to the customers and accountability to the company.

3. Responsiveness

Responsiveness means government's willingness to help with citizens' requests and provide prompt services when needed (Osman et al., 2014). Being responsive indicates that the government listens to citizens' feedback and acknowledges it. Responsiveness is a characteristicthat is desirable by the citizens (Bannister and Connolly 2011) as it improves their satisfaction and trust in government (Bannister and Connolly, 2011; Vigoda-Gadot and Cohen, 2015; Ubaldi, 2013). Being responsive means to welcome citizens' feedbacks, requests or suggestions, to acknowledge and bring the matter forward for further action. If nothing could be done about therequest, government should explain why. It is not necessarily responsive in terms of meeting and delivering all the demands. Response from the government is important because it will encourage citizens to participate. The use of ICT has the potential to strengthen government's responsiveness towards its citizen (Al Khouri, 2011; United Nations, 2014). Response should be easy and simple to understand, which in short sentences and using words and language that a citizen could recognize. Enforcement of Service Level Agreements (SLA) with all governmentagencies can ensure that citizens get improved responsiveness for their service requests. Also, the culture in the civil service itself has to be change before the public can have good responsefrom the civil servants who are handling public issues.

4. Participation

Participation refers to citizens' contribution in government's planning and decision- making and using of government data to create better services for the community. In the context of e-government, participation has variety of purpose such as informing citizens, generating support among citizens, utilizing citizens' input in decision making, and probing for citizens' needs (Phang and Kankanhalli ,2008). By connecting with citizens in the early stage of e- government initiatives, it will make them own the services that they have contributed to, thus increasing the take-up level. A proper framework should be in place before embarking in any participation effort where guidelines in designing the initiative, preparation of ICT used and information material, realization and evaluation of the initiative objectives are laid out (Scherer, Wimmer and Ventzke, 2010). Contents should be engaging as to capture the interest of citizens. Participation initiatives should be seen as helping the government to make decision, not to replace its authority. In that decision-making process, inputs from all parties will be gathered, analyzed and synchronized to come out with solutions that fulfill objectives and address all stakeholders' interests.

5. Trust

According to Abu Shanab (2014), trust is a key factor in determining whether or not citizens use e-government services. The likelihood that citizens will embrace e-government services increases with their level of trust (Bélanger and Carter, 2008). Social media usage is a relatively new e-government technique with scant empirical support. The trust and acceptance of these services among citizens are crucial for the success of such e-government efforts. Therefore, in order to encourage citizen participation in social media-based e-government services, it is important for government entities to understand the elements that influence citizen trust (Khan, Zhaira, Rahim & Maarop, 2020). The success and utilization of e-government are largely dependent on trust. The implementation of e-government aims to promote ideals, one of which is encouraging citizen participation in democratic decision-making. Kelly, Mulgan and Muers (2002) assert that trust is a crucial component of e-government, particularly when it comes to services relating to the privacy and security of citizens using online services. The government can increase public trust in the governance system and supporting technologies through fostering trust in e-government (Carter & Bélanger, 2005).

6. Usability

Usability has been defined as the quality of a user's interaction with a website, frequently assessed by how easily the user can find the content they are looking for (Palmer, 2002). Usability has drawn attention in the context of website evaluation for websites in the public and private sectors (Zaman, 2010). In the context of evaluating the quality of a website, usability refers to factors primarily related to user-friendliness or usability, such as navigation, search parameters, content classification, and linkages to other websites and services (Agarwal and Venkatesh, 2002).

7. Usability, a well-known concept in Human-Computer Interaction research, assesses how easy and efficient it is for anyone to utilize a product to carry out tasks (Han, Yun, Kwahk & Hong 2001). Usability is a crucial factor in determining effectiveness (Karahoca, Bayraktar, Tatoglu & Karahoca, 2010) and user involvement frequency

(Lee & Koubek, 2010). As a result, usability has been extensively discussed in system design, initiatives, and products. Usability has been found to impact on users' mindset, perception and use of e-services. Similarly, it is found that usability is a critical component to achieving e-government objectives (Chang & Almaghalsah, 2020).

III. Methodology

A quantitative research design was adopted in the study. Specifically, questionnaire survey strategy was used to obtained data from the target population. Considering the nature of the problem being investigated, the target population of the study is the entire citizens of UAE who have access to internet and smart phones. According to statistics there were 9.38 million internet users in the UAE with 99% of the population having access to internet (Kemp, 2023). A total of 392 questionnaire were administered to collect data from the target respondents. The analysis was conducted using descriptive statistics (mean, standard deviation and relative importance index (RII)) and analysis of variance (ANOVA). The RII was computed using the formular:

$$RII = \sum \frac{wn}{pN}$$

Where:

w = is the weight given to each item by the respondents, which range from 1 to 5; such that 1 the least implying (inferior) and 5 the highest implying (superior) position/opinion;
n = number of respondents that select particular option;
p = is the highest weight (5 in 5-point Likert scale); and
N = total number of respondents.

IV. Data Analysis

A. *Demographic of respondents*

Table 1 shows the frequency and percentage of the research respondents according to their gender, age, education, employment status and internet usage. The gender distribution of the respondents shows that out of 392 respondents, 251 (64%) were male and 141 (36%) were female. The analysis further shows that majority of the respondents were in the age group 28-37 years, with 150 (38.2%) respondents while slightly above one-third were in the age group 18-27 years. Analysis of the educational qualification of the respondents shows more than half had master degree 220 (56.1%), about 42% had Bachelor degree while only 2.3% indicated that they had PhD. Result of the analysis with regard to the employment status of the respondents shows that employed/self-employed, was the most common option with 221 (56.4%) respondents, followed by student (27%, retired about 15% then unemployed 1.8%. The most common internet usage frequency was 1 to 4 times per day, with 141 (36%) respondents while the least frequency is once a week and once a month with each having 6.1%.

TABLE I. De mogrpahic characteristics of respondents

		Frequency	Percent
Gender	Male	251	64.0
	Female	141	36.0
Age	18-27 years	130	33.2
	28-37 years	150	38.2
	38-47 years	54	13.8
	Above 47 years	58	14.8
Education	Degree	163	41.6
	Masters	220	56.1
	PhD	9	2.3
Employment Status	Student	106	27.0
	Employed/ self-employed	221	56.4
	Unemployed	7	1.8
	Retired	58	14.8
Internet Usage	More than 9 times/day	36	9.2
	5 to 8 times/day	130	33.2
	1 to 4 times/day	141	36
	A few times a week	37	9.4
	Once a week	24	6.1
	Once a month	24	6.1

As sown in the Table 2 the respondents rated all the factors highly, with mean scores ranging from (M = 3.994; SD = .9786) to (M = 4.084; SD = .873). The factors with the highest mean scores were transparency (M = 4.084; SD = .873) and trust (M = 4.082; SD = .813), which means that the respondents valued these aspects of smart government services the most. The factors with the lowest mean scores were usability (M = 3.99; SD = .978) and participation (M = 4.000; SD = .967), which implies that these factors felt short of the expectations of the respondents with regard to smart government services.

B. *Factor determining citizen's expectation of smart government services.*

In order to ascertain what factors are likely to influence acceptance of smart government services in the study area, the respondents' opinion was sought to understand their expectations with respect of smart government services. Table 2 presents the result of the analysis. The table shows the mean, standard deviation and relative importance index of different factors related to smart government services, such as openness, responsiveness, transparency, trust, participation and usability. Each factor is composed of several items that were rated by the respondents on a scale of 1 to 5, where 5 is the highest.

Similarly, result of the relative importance index (RII) shows that corroborate the mean score result. The ranking of factors based on the RII sows that transparency

was ranked highest in terms of importance with an RII value of (RII=0.816), followed by trust (RII=0.814) having the next highest values then responsiveness (RII=0.809), participation (RII=0.789) and lastly, usability (RII=0.778) in descending order of importance.

TABLE II. DETERMINATION OF CITIZENS' EXPECTATION OF SMART GOVERNMENT SERVICES

	N	Mean	Std. Deviation	Relative Importance Index
opn1	392	4.0671	.86231	0.794
opn2	392	3.9471	.88666	0.769
opn3	392	4.1029	.95580	0.804
opn4	392	4.1505	.89345	0.830
Openness		**4.0669**	**.8996**	**0.799**
res1	392	4.0825	.88576	0.815
res2	392	4.1209	.87690	0.822
res3	392	3.8992	.87973	0.773
res4	392	3.9949	.93523	0.799
res5	392	4.0648	.87989	0.811
res6	392	4.1556	.78592	0.831
Responsiveness		**4.0529**	**.8739**	**0.809**
tran1	392	4.1403	.75568	0.828
tran2	392	4.1005	.84381	0.818
tran3	392	4.0663	.80006	0.813
tran4	392	4.0306	.81801	0.806
Transparency		**4.0844**	**.87390**	**0.816**
trus1	392	4.1148	.80572	0.823
trus2	392	4.1301	.68294	0.826
trus3	392	4.1403	.75906	0.828
trus4	392	3.9418	1.00428	0.777
Trust		**4.0818**	**.81300**	**0.814**
part1	392	3.9344	.99463	0.773
part2	392	4.0826	.88851	0.813
part3	392	3.9785	.98825	0.780
part4	392	4.0066	.99847	0.789
Participation		**4.0005**	**.96747**	**0.789**
usa1	392	3.9969	.94140	0.782
usa2	392	4.0340	.97821	0.789
usa3	392	4.0182	1.05322	0.792
usa4	392	3.9874	.92131	0.769
usa5	392	3.9340	.99903	0.756
Usability		**3.9941**	**.97863**	**0.778**

C. Descriptive statistics Figures and Tables

In order to understand whether there is significant difference across different age groups among the respondents on their expectation on smart government services, analysis of variance was conducted.

Table 3 shows the results of statistical tests that were conducted to examine whether there were significant differences in the mean scores of the factors related to smart government services across different age groups of respondents. The descriptive statistics of the mean scores for each factor and age group were displayed in Table 1. With respect to openness, the highest mean score is shown to be for the 18-27 years age group (M=4.223; SD=.729), while the lowest mean score is related to the 28-37 years age group (M=4.140; SD=.803).

Regarding responsiveness, the highest mean score is recorded for the 28-37 years age group (M=4.352; SD=.812), while the lowest mean score recorded relates to the 'above 47 years' age group (M=4.103; SD=.788), Similarly, the highest mean score for transparency was recorded for the 18-27 years age group (M=4.238; SD=.657), with a corresponding lowest mean for 28-37 years age group (M=4.167; SD=.727).

The age group 38-47 was shown to have the highest mean score with respect to trust (M=4.296; SD=.690), while the lowest mean score was recorded in respect of the age group above 47 years (M=4.103; SD=.693). Respondents mean score for participation showed that the age group 18-27 years had the highest mean score (M=4.177; SD=.762) and a lowest mean score for the age group (M=4.047; SD=.885). Finally, the descriptive table sows that the 18-27 years age group has the highest mean score in respect of usability (M=4.108; SD=.729) and a corresponding lowest mean score for the age group above 47 years (M=3.879; SD=.880).

TABLE III. DESCRIPTIVE STATISTICS

		N	Mean	Std. Deviation	Std. Error
Openness	18-27 Years	130	4.2231	.72887	.06393
	28-37 Years	150	4.1400	.80293	.06556
	38-47 Years	54	4.2037	.83281	.11333
	Above 47 Years	58	4.2069	.74360	.09764
	Total	392	4.1862	.77262	.03902
Responsiveness	18-27 Years	130	4.1231	.75755	.06644
	28-37 Years	150	4.1800	.81158	.06627
	38-47 Years	54	4.3519	.75629	.10292
	Above 47 Years	58	4.1034	.78784	.10345
	Total	392	4.1735	.78379	.03959
Transparency	18-27 Years	130	4.2385	.65656	.05758
	28-37 Years	150	4.1667	.72738	.05939
	38-47 Years	54	4.2222	.83929	.11421
	Above 47 Years	58	4.2241	.67650	.08883
	Total	392	4.2066	.71209	.03597
Trust	18-27 Years	130	4.2154	.62238	.05459
	28-37 Years	150	4.1733	.72117	.05888
	38-47 Years	54	4.2963	.69035	.09395

	Above 47 Years	58	4.1034	.69306	.09100
	Total	392	4.1939	.68088	.03439
Participation	18-27 Years	130	4.1769	.76214	.06684
	28-37 Years	150	4.0467	.88490	.07225
	38-47 Years	54	4.0926	.93705	.12752
	Above 47 Years	58	4.1207	1.04424	.13712
	Total	392	4.1071	.87812	.04435
Usability	18-27 Years	130	4.1077	.72866	.06391
	28-37 Years	150	3.9733	.83503	.06818
	38-47 Years	54	4.0000	.72684	.09891
	Above 47 Years	58	3.8793	.88014	.11557
	Total	392	4.0077	.79477	.04014

To test whether the mean scores of the different factors across different age groups are homogenous, the test of homogeneity of variance was conducted. Table 4 shows the results of the Levene's test, which tests whether the variances of the scores are equal across different age groups. As shown in the result, the significance values for all factors are greater than 0.05, which means that there is no evidence to reject the null hypothesis that the variances are equal.

TABLE IV. TEST OF HOMOGENEITY OF VARIENCES

	Levene Statistic	df1	df2	Sig.
Openness	.388	3	388	.762
Responsiveness	.797	3	388	.496
Transparency	1.848	3	388	.138
Trust	1.242	3	388	.294
Participation	1.228	3	388	.299
Usability	.846	3	388	.470

Furthermore, analysis of variance test was conducted to further probe of the statistical significance of the equality of means of the factors across the four age groups. Table 5 shows the results of the analysis of variance. As indicated in the Table, the alpha values for all factors are greater than 0.05, which means that there is no evidence to reject the null hypothesis that the mean scores are equal. This suggests that there is no statistically significant difference in openness, transparency, trust, participation, or usability among different age groups ($p > 0.05$ for all variables). Overall, the result shows that there were no significant differences in the respondents' expectations of smart government services based on their age groups.

TABLE V. ANOVA

		df	Mean Square	F	Sig.
Openness	Between Groups	3	.179	.299	.826
	Within Groups	388	.600		
	Total	391			
Responsiveness	Between Groups	3	.780	1.272	.284
	Within Groups	388	.613		
	Total	391			
Transparency	Between Groups	3	.134	.263	.852
	Within Groups	388	.510		
	Total	391			
Trust	Between Groups	3	.388	.836	.475
	Within Groups	388	.464		
	Total	391			
Participation	Between Groups	3	.401	.518	.670
	Within Groups	388	.774		
	Total	391			
Usability	Between Groups	3	.812	1.288	.278
	Within Groups	388	.630		
	Total	391			

V. DISCUSSION

The study explored the factors that determine citizens' expectations of smart government services in UAE. A survey method was adopted to collect data from 392 respondents and analyzes the data using descriptive statistics and analysis of variance. The study identified six factors that influence citizens' expectations of smart government services: openness, responsiveness, transparency, trust, participation, and usability. It was found that all these factors are rated highly by the respondents, with transparency and trust being the most important ones. The finding corresponds to that of Simonofski, Clarinval, Vanderose, Dumas, and Snoeck, (2021) who identified these factors as important for citizens' roles in digital government.

Similarly, the study found that that transparency and trust are the most important factors for citizens' expectations of smart government services. This agrees with the result of Alshomrani, Almutairi, and Alghamdi (2021) who found that trust is a key factor for measuring citizens' satisfaction with smart government services, and that trust is influenced by technological aspects, government aspects, and citizen engagement.

Furthermore, it was found that there is no significant difference in the expectations of smart government services across different age groups of respondents. This coincided with the findings of Srce (2021) who found that age is one of the psychological factors that affect smart government information security, along with security awareness, behavior security, and moral level.

VI. CONCLUSION

Using a survey methodology, the study investigated the elements that influence citizens' expectations of smart government services in UAE. The study highlighted six aspects—openness, responsiveness, transparency, trust, involvement, and usability—that affect citizens' expectations of smart government services. All of these criteria were discovered to be highly valued by the respondents, with trust and transparency considered as the most crucial. Furthermore, it was discovered that there are no statistically significance differences in respondents' expectations of smart government services across various age groups. The study

adds to the body of knowledge on the adoption of smart government and offers recommendations for practitioners and policymakers who want to increase citizens' acceptance and confidence in smart government services.

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