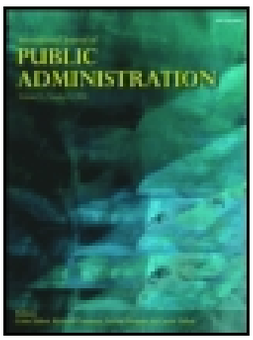

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Impact of Government Capacity and E-Government Performance on the Adoption of E-Government Services

Isaac Kofi Mensah

School of Economics and Management, JiangXi University of Science and Technology, Ganzhou, Jiangxi, P.R.China

ABSTRACT

This study explored the impact of government capacity and e-government performance on the adoption of e-government services by integrating it into the Technology Acceptance Model (TAM). The results showed that both government capacity and government performance were significant determinants of the perceived usefulness of e-government services. Also, government capacity was revealed to positively predict e-government performance. In addition, perceived usefulness of e-government services was found to be a significant predictor of the intention to recommend the adoption of e-government services. The implications of these findings on the implementation of e-government are discussed.

KEYWORDS

E-government; e-government services; government capacity; e-government performance; Technology Acceptance Model

Introduction

The power of computer-based information and communication technologies (ICTs) have been harnessed by governments particularly in developing countries in order to improve the capacity of government to rule and govern, serve its citizenry and enhance the human development conditions of its citizens (Gant, 2008). One of the resultant effects of ICT in increasing government capacity to govern, serve and improve the human development status of its people is electronic government. E-government is an important part of the digital government which has to do with the provision of public services through the use of information and communication technologies especially with the use of virtual internet (Gant, 2008). It is defined as the application of ICT to augment and support all forms of government operations, interact and engage citizens, provide quality public services, and promote higher levels of government accountability (Dawes, Gregg, & Agouris, 2004; Faulkner, Jorgensen, & Koufariotis, 2018). E-government is meant among others to make public sector and government operations efficient and transparent, reduce waste of public resources and importantly attaining good governance (Waksberg Guerrini, 2008). According to Dada (2006), e-government goes beyond just the computerization of government processes or systems but importantly the potential of technology to provide higher standards of improvement in all sectors of government which enables the transformation of interaction between government and the public (citizens and business). Also, e-government is an important component of government strategy in which the provision of information, delivery of services and engagement with citizens and business are greatly changed (Zhang, Xu, & Xiao, 2014).

The successful implementation of e-government is no doubt dependent on the extent of government capacity and e-government performance. For e-government to deliver on the main objective for its implementation these two ingredients (government capacity and e-government performance) are integral components which must be examined. Government capacity has to do with the government's ability to formulate and implement public policies effectively (Kaufmann, Kraay, & Mastruzzi, 2011). In addition to framing and implementing quality policies, government capacity is about governments demonstrable credibility and potential to provide quality public services and show a high degree of independence from any form of political pressures (Kaufmann, Kraay, & Mastruzzi, 2010; Kaufmann et al., 2011). On the other hand, e-government performance has to do with the availability of a certain organizational, social, economic and technological infrastructure for the implementation of e-government to be successful. Factors such as system and technology issues, political, processes, organizational, legal issues and security, management citizen interaction, inter-departmental collaboration and integration and public-private sector partnerships are important fundamental issues for the performance of e-government (Kim, 2007; Suri, 2017).

CONTACT Isaac Kofi Mensah 1185842364@qq.com School of Economics and Management, JiangXi University of Science and Technology, No. 86, Hongqi Ave.,Ganzhou, Jiangxi 341000, P.R.China

Specifically, Kim (2007) elaborated that internet penetration and usage, educational status of citizens, level of economic development and wellbeing, government effectiveness and protection of individual freedom and civil liberties are major factors influencing issues of e-government performance.

The objective of this current study is to examine the impact of government capacity and e-government performance on the adoption of e-government services. The research questions to be explored are: To what extent do government capacity and e-government performance determine the adoption of e-government services? This study has contributed to the e-government adoption literature by demonstrating first that both government capacity and e-government performance is a significant determinant of the perceived usefulness of e-government services and secondly that the perceived usefulness of e-government services is a positive predictor of the intention to recommend e-government services adoption.

The rest of the paper presents the theory and hypotheses development, research model, research methodology, results and data analysis, discussion, conclusion and limitation and future study.

Theory and hypotheses development

The Technology Acceptance Model (TAM) developed by Davis (1989) has two important factors such as perceived usefulness and perceived ease of use determining the behavioral intention to use. TAM is considered the extension of the Theory of Reason Action. TAM is popular and its application covers several areas and provides an understanding of the individual decision to engage and interact with new technology adoption. Studies have validated, extended and integrated other factors into the TAM model in fields such as e-government (Alryalat, 2017; Dahi & Ezziane, 2015; Ma & Zheng, 2018; Mensah, Vera, & Mi, 2018; Sebetci, 2015), e-learning (Abdullah & Ward, 2016; Gamble, 2018; Mohammadi, 2015), e-health (Chauhan & Jaiswal, 2017; de Veer et al., 2015; Hoque, Bao, & Sorwar, 2017; Hossain, Yokota, Sultana, & Ahmed, 2018), e-commerce (Awa, Ojiabo, & Emecheta, 2015; Biucky & Harandi, 2017; Pei, Xue, Li, Chang, & Su, 2015; Pei, Xue, Li, & Su, 2016), e-banking (Fahmi & Rohman, 2018; Munoz-Leiva, Climent-Climent, & Liébana-Cabanillas, 2017; Samar, Ghani, & Alnaser, 2017), mobile payment (Alalwan, Baabdullah, Rana, Tamilmani, & Dwivedi, 2018; Bailey, Pentina, Mishra, & Ben Mimoun, 2017; Humbani & Wiese, 2018). These extensive applications of the technology acceptance model provide the needed impetus for researchers to continue to rely on and apply the TAM as the basis for explaining the user adoption of new technologies.

Perceived usefulness (PU)

Perceived usefulness is defined as the extent to which the individual user believes that using new information technologies would improve his or her job performance (Davis, 1989). It does follow naturally that the user perception that the adoption of new technology will enable the realization of the objective for the use of such technologies will definitely encourage its usage. The significant impact of perceived usefulness on the intention to use e-government services has been well established in the literature (Chemisto & Rivett, 2018; Hussein, Mohamed, Rahman Ahlan, & Mahmud, 2011; Mensah et al., 2018; Sambasivan, Patrick Wemyss, & Che Rose, 2010). However, the user perception of the perceived usefulness of new technologies such as e-government services can also influence the user to recommend the adoption of it. Consequently, H1 was proposed.

H1: Perceived usefulness is positively related to the intention to recommend e-government services.

Government capacity (GC)

Government capacity has to do with the effectiveness of government (Stier, 2015). It is defined as the effectiveness of government in terms of its commitment to the quality of the civil service civil and public service delivery, free from political manipulation and pressures and its approach to policy initiatives and implementation (Kaufmann et al., 2010, 2011). Government capacity is, therefore, the ability of government and its agencies to be able to formulate and implement effective and sound policies (Kaufmann et al., 2010). E-government implementation is a matter of government policy and the success of it depend on the government's capacity and effectiveness. Hence government capacity to provide the needed policy regulatory framework and other accompanying policy issues for the implementation of e-government is fundamentally crucial for the development and implementing effective and sound e-government programs. According to Stier (2015), governments can use their capacity and effectiveness to enhance e-government performance. It has also been indicated that government effectiveness has the potential to determine the performance of e-government (Kim, 2007). Also, the basic foundation for good performance of e-government is hinged on the competence of public sector agents on public service delivery, the sound structure of the bureaucratic system, professionalism and the separation and protection of the civil service from any political interference (Kim, 2007). The extent of government capacity can

determine the perceived usefulness and e-government performance. The study of Stier (2015) demonstrated that government capacity is a predictor of e-government performance. Consequently, H2 and H4 were proposed.

H2: Government capacity is positively related to the perceived usefulness of e-government services.

H3: Government capacity is positively related to e-government performance.

E-government performance (EGP)

E-government performance is the presence or availability of certain important social, political, technological, organizational attributes and economic factors for the successful implementation of e-government (Kim, 2007). Some of these factor as identified by Kim (2007) are level of internet usage and access, education level of citizens/users, the economic wealth prevailing, government effectiveness, guaranteeing of civil liberties and the extent of information technology development. In addition, for e-government to perform as expected it must overcome some challenges such as system and technology issues, processes, organizational issues, legal issues, security, citizen relationship management and effective public-private partnership (Suri, 2017). E-government performance is also dependent on the offline administrative management framework and culture (Stier, 2015). Thus the availability of these indicators discussed above is vital for the performance of e-government which will, in turn, determine the perceived usefulness of e-government services. Accordingly, H4 was proposed.

H4: E-government performance is positively related to the perceived usefulness of e-government services.

Research model

The research model to be explored is shown in Figure 1. Perceived usefulness of e-government services is assumed to have a direct impact on the intention to recommend. Government capacity is also assumed to have a direct impact on both the perceived usefulness of e-government services and e-government performance. E-government performance is proposed to impact on the perceived usefulness of e-government services.

Research methodology

The data for this study were acquired using the popular method of a questionnaire instrument. The variable for perceived usefulness, intention to recommend, government capacity and e-government performance were adopted from previous studies but were modified to reflect the content of this latest study. Perceived usefulness was adapted from (Davis (1989); Tarhini, Hone, Liu, & Tarhini, 2017), intention to use from Oliveira, Thomas, Baptista, and Campos (2016), government capacity and e-government performance from (Kim, 2007; Stier, 2015). But question items for both government capacity and e-government performance were self-developed. The questionnaire instrument is attached as Table A1. Questions were measured on five-point Likert scales from 1 = strongly disagree to 5 = Strongly Agree. The questionnaire was then administered to 500 Chinese students in the city of Ganzhou who were the targeted sample size of this study. The questionnaire was developed first in English but was translated into the Chinese language. This was done to achieve a maximum understanding of the respondents in answering the questions in the instrument. 289 of questionnaires were recovered after it was administered which accounts for 57.8% of the total distributed questionnaires. A total of 33 questionnaires were not used because they were partially completed and hence it was decided not to be captured.

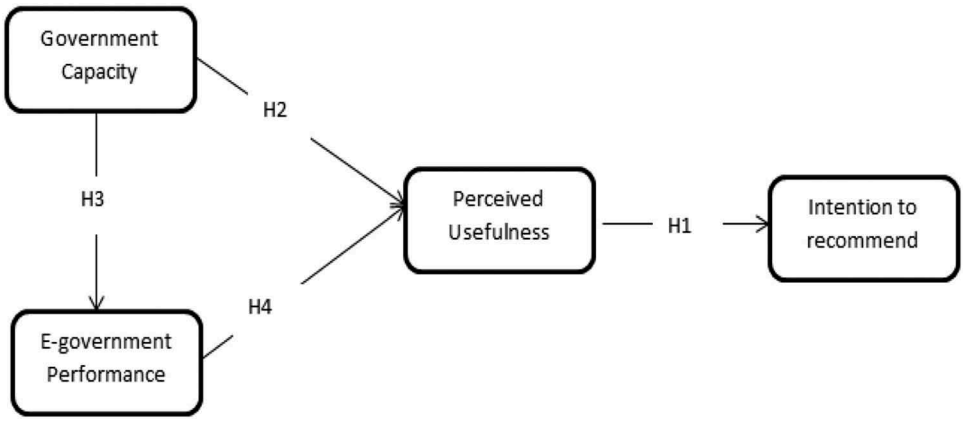

Figure 1. Research model.

Therefore 256 (51.2%) of the questionnaires were found to be fully completed and were captured for the analysis. SPSS was used to undertake the analysis.

Results and data analysis

Sample characteristics

The sample statistics of the respondents are shown in Table 1. Female and male respondents were 53.5% and 46.5% respectively. The largest age group ranged from 18–25 (52.3%) and 68.4% were undergraduate students.

Validity and reliability tests

The results of the validity and reliability analysis are shown in Table 2. Factor loadings, Cronbach's alpha, average variance extracted and composite reliability were used to access the reliability and validity of the items measured in this study. Acceptable factor loadings should be above 0.70 (Hair, Sarstedt, Ringle, & Mena, 2012; Henseler, Ringle, & Sinkovics, 2009), Cronbach alpha values recommended to be above 0.70 (Henseler et al., 2009; Saunders, Lewis, & Thornhill, 2009), composite reliability above 0.8 (Nunnally & Bernstein, 1994) and AVE should be above 0.5 (Fornell & Larcker, 1981). The values obtained respectively for the factor loadings, Cronbach alpha, AVE, and composite reliability met the recommended values indicated above and this means that that the internal consistency of the items measured is reliable and hence can be used to examine the structural relationship.

Correlation analysis

The results of the correlation analysis conducted, mean and standard deviation statistics are displayed in Table 3. All the constructs (perceived usefulness, intention to use, government capacity and e-government performance) were positively correlated and significant ($p < .01$).

Research hypotheses testing

The results of the research hypotheses conducted are shown in Table 4 and graphically in Figure 2. All the research hypotheses were significantly supported. Perceived usefulness was found to be significant in determining the intention to recommend e-government services (beta = 0.986, t = 93.847, $p < .05$). H1 was therefore supported. Also government capacity was positively significant predictor of both the intention to use e-government services (beta = 0.987, t = 99.318, $p < .05$) and e-government performance (beta = 0.974, t = 86.976, $p < .05$). Hence H2 and H3 were supported. Finally, e-government performance was furthermore found to impact significantly on the perceived usefulness of e-government services (beta = 0.984, t = 87.978, $p < .05$). Accordingly, H4 was supported.

Table 1. Sample characteristics.

Item		Frequency	Percentage
Gender	Male	119	46.5%
	Female	137	53.5%
Age distribution	18–25	134	52.3%
	26–30	86	33.6%
	31+	36	14.1%
Education	Undergraduate	175	68.4%
	Masters	81	31.6%

Table 2. Results of validity and reliability test.

Variable		Loadings	Cronbach alpha	AVE	Composite Reliability
Perceived Usefulness	PU1	0.963	0.965	0.923	0.983
	PU2	0.979			
	PU3	0.963			
	PU4	0.933			
	PU5	0.964			
Intention to Recommend	ITR1	0.928	0.959	0.890	0.976
	ITR2	0.958			
	ITR3	0.929			
	ITR4	0.976			
	ITR5	0.933			
Government Capacity	GC1	0.922	0.945	0.876	0.973
	GC2	0.969			
	GC3	0.944			
	GC4	0.950			
	GC5	0.896			
E-government Performance	EGP1	0.980	0.952	0.887	0.975
	EGP2	0.948			
	EGP2	0.926			
	EGP3	0.971			
	EGP4	0.881			

Table 3. Results of correlation analysis.

Item	No.	Mean	Std. Dev.	PU	ITR	GC	EGP
PU	256	3.287	1.049	–			
ITR	256	3.300	1.025	0.986	–		
GC	256	3.493	1.072	0.987	0.987	–	
EGP	256	3.271	1.082	0.984	0.993	0.984	–

Correlation is significant at the 0.01 level (2-tailed).

Discussion

This study explored the impact of government capacity and e-government performance on the adoption of e-government services. All the proposed research hypotheses were statistically supported. The results have illustrated that

Table 4. Results of research hypotheses tested.

Hypotheses	Path	r^2	Beta	t	Sig.	Supported(Yes/No)
H1	PU-ITR	20.5	0.986	93.874	***	Yes
H2	GC-PU	31.8	0.987	99.318	***	Yes
H3	GC-EGP	25.2	0.974	86.976	***	Yes
H4	EGP-PU	32.3	0.984	87.978	***	Yes

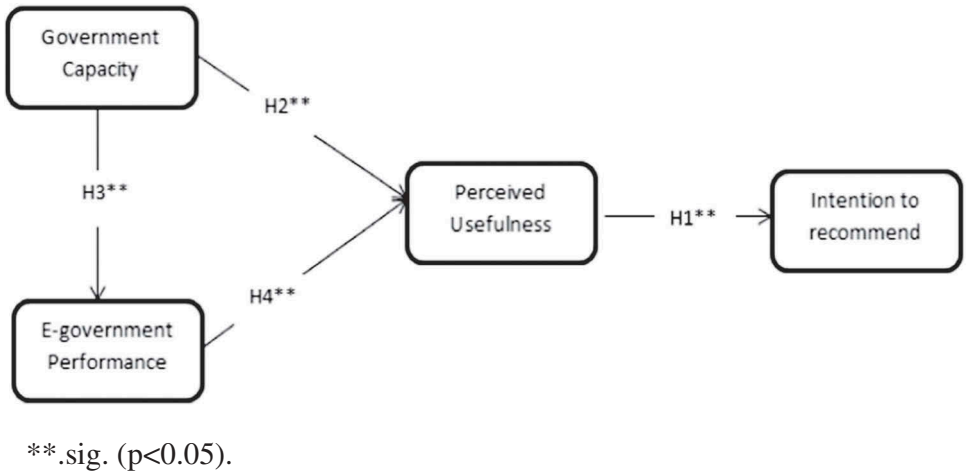

Figure 2. Path model (significant path).
**.sig. ($p < .05$).

perceived usefulness of e-government services is a positive significant predictor of the intention to recommend e-government services. Also government capacity is a significant determinant of both the perceived usefulness of e-government services and e-government performance. Again, e-government performance was found to positively influence the perceived usefulness of e-government services. The perceived usefulness in the Technology Acceptance Model is often tested via attitude towards use (AlBar & Hoque, 2018; Davis, 1989; Sari, Akkaya, & Abdalla, 2017) and directly on the behavioral intention to use e-government services (Alotaibi, Houghton, & Sandhu, 2017; Alryalat, 2017; Bwalya, 2017; Mensah, 2017; Mensah et al., 2018). But in this current study, the direct relationship between the perceived usefulness of e-government and the intention to recommend e-government was proposed and validated its significant impact on the intention to recommend. This is an important modification of the technology acceptance model having its endpoint (goal) as the intention to recommend. This means that the extent to which citizens are of the firm belief that e-government services will be usefulness in accessing high-quality public services then they will recommend to others as well. Recommendations of e-government services by peers or friends are crucial to promoting and encourage the adoption of e-government services which is vital to the successful implementation of e-government projects.

The positive significant impact of government capacity on the perceived usefulness of e-government services and e-government performance is indicative that the potential of government to demonstrate it has the capacity and commitment to formulate and implement good policies particularly governing the implementation of e-government projects, and demonstrate independence from political pressures reflects citizens understanding of the usefulness and e-government performance. The significant effect of government capacity on e-government performance is in line with the previous study which showed that e-government capacity is a positive significant predictor of e-government performance (Stier, 2015).

In addition, the positive determinant of e-government performance on the perceived usefulness of e-government services is indicative that the existence and tackling of certain factors or attributes such as economic, social, political, technological and organizational issues are fundamental to the determining the perceived usefulness of e-government services. Explicitly, expanding the access and coverage of internet usage, improving the level of education and awareness, the economic status of the citizens, and protecting individual freedom and liberty (Kim, 2007) are non-negotiable and necessary which will determine the extent of e-government performance which will, in turn, affect positively or negatively the usefulness of e-government services in providing quality public services to citizens, improve interaction between citizens and government and importantly hold government accountable.

Conclusion

This paper integrated government capacity and e-government performance into the Technology Acceptance Model to investigate the adoption of e-government services. The results have indicated that both government capacity and e-government performance is a significant determinant of the perceived usefulness of e-government services. It was also shown that government capacity positively influences e-government performance. In addition, the perceived usefulness of e-government services was found to be a significant predictor of the intention to recommend the adoption of e-government

services. These findings have both theoretical and practical implications for the implementation of e-government as better means to provide quality public services to the citizen and the general public.

Practical implications

Government capacity to initiate and implement e-government is dependent on a sound policy formulation and regulatory framework which is the backbone for the implementation of e-government. The government, therefore, must demonstrate its commitment to see through an effective policy to realize the objectives for the implementation of e-government. These demonstrable government capacities have the potential to influence citizens of the perceived usefulness of e-government services and the e-government performance. Also, government preservation and protection of individual citizens freedom particularly freedom of expression are fundamental to the citizen's perceptions of the usefulness of e-government services. E-government should be used as a tool to empower and encourage citizens to express their opinions about government programs and actions without the fear of being blacklisted or intimidated. This will ensure that e-government becomes an effective enabling tool not only to bridge the gap between government and its citizens but also to bring on convergent and divergent policy options/views and ideas on board as the government implements public policies.

Another implication is that the availability of the antecedent of e-government performance determines the extent to which the ordinary citizen will perceive e-government services to be usefulness. These antecedents of e-government performance such as education, availability of the internet, the level of ICT infrastructure development, income level or economy circumstance of the people, and ensuring civil liberties are protected are the basis and important for smooth implementation of e-government and adoption of e-government services. The continued expansion of internet access and connectivity should be a continued top priority for governments since citizens' use of e-government services will be dependent on the extent to which they have access to faster internet connectivity. Also, the government should constantly implement policies that seek to improve citizens' economic well-being, since the poor economic well-being of citizens will deprive them of the needed financial resources to for instance purchase computers, handsets and internet bundles for them to assess the public services through e-government. Another critical area that contributes to e-government performance is the granting of individual liberties. The absence of protected civil liberties such free expression of citizens views and opinions concerning government activities and actions will defeat the two-way communication purpose of e-government. As indicated by Kim (2007), the government through e-government websites should provide avenues for citizens and the public to voice their opinions, offer practical suggestions for better government public services, and monitor government programs, and activities. Another critical area is that the lack of education can impede the e-government implementation and extension of e-government performance. An educated population will be a sound basis for e-government to function effectively and can determine the extent to which citizens will expect e-government to be useful. Hence the government must ensure that provision of education, at least basic education for its citizenry. It gives citizens the opportunity not only to benefit from e-government implementation but from other socio-economic developmental programs. Tacking and addressing these issues of internet access, education, individual economic well-being, protection of individual personal liberties expatiated are important for e-government performance which will, in turn, determine the perceived usefulness of e-government services.

In addition, the implementation of e-government chiefly is to provide a better alternative for citizens to access quality public service, enhance the interaction between the citizens and government and its agencies and also improve government openness and transparency to citizens. Government openness and transparency is an important element to tackle the perceived corruption in government both at the local and national level. Hence, citizens will consider e-government to be useful if its implementation will provide and continue to provide quality public service, effective citizen-government interaction and relevant and timely availability of information on government business as anticipated by citizens, businesses and the general public. Citizens' perceptions that the perceived usefulness of e-government services can achieve these ideals will ultimately drive them to recommend the use of e-government services to others as well. In order to get to the point where citizens can recommend e-government services, it behooves on government and its implementing agencies of e-government to ensure that the main goals and objectives of the implementation of e-government are achieved as anticipated by citizens and businesses. So it does follow that if e-government implementation fails to achieve these anticipations of citizens to enjoy quality public services, it will affect their sense of the usefulness of e-government services and hence will not recommend the use of e-government services.

Theory implications

From the theory perspective, this study has integrated and modified the Technology Acceptance Model and established that government capacity and e-government performance is a significant factor in determining the perceived

usefulness of e-government services. Government capacity was also validated to impact positively on the e-government performance while perceived usefulness of e-government services was also empirically proven to have a direct impact on the intention to recommend. These theoretical contributions appear to be unique to this current study as far as the e-government literature is concerned and hence has enriched the e-government adoption literature.

Limitation and future research

Government capacity and issues determining e-government performance vary from one country to the other. Hence this study could be applied in other country's context and the results may not reflect or support the currents findings. Also, the sample size may not be representative and hence the interpretation and generalization of the results must be done with caution.

Notes on contributor

Dr. Isaac Kofi Mensah is currently an Associate Professor at the School of Economics and Management, Jiangxi University of Science and Technology, Ganzhou, Jiangxi, China. He is also the Founder and President of the Africa-Asia Dialogue Network (AADN), a Think Tank for global research and advocacy. He received his Ph.D. in Public Administration from the School of Management, Harbin Institute of Technology, Harbin, Heilongjiang, China. He got his Master's degree from Hunan University located in Hunan Province, Changsha, China and Bachelor's degree from the University of Ghana, Accra, Ghana. His research interests include e-government, local e-government, local government, e-voting, e-business/e-commerce, and cross-border e-commerce.

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Table A1. Questionnaire items.

Variable	Items
Perceived Usefulness	
PU1	I think e-government is useful for me
PU2	Use of e-government service will enable me to complete my task quickly
PU3	Use of e-government services will enable me to enjoy quality public services
PU4	I think e-government services will meet my expectations of the services required
PU5	Overall, I think e-government is very useful
Government Capacity	
GC1	The government has a good record in delivering quality public services
GC2	The government has a good record in the implementation of public policy programs
GC3	The civil service has well-skilled workers and it is independent
GC4	The government has demonstrated a strong commitment to formulate and implement policies
GC5	The government has the credibility and political will to initiate programs
E-government Performance	
EGP1	I have access to the internet
EGP2	There is available the required technology infrastructure
EGP3	I have a good level of education to be able to comprehend issues about e-government (search, interpret, read, use, evaluate information)
EGP4	My economic condition is good and hence can afford computers, mobile phones, and access to the internet
EGP5	My personal civil liberties and freedom are protected at all times
Intention to Recommend	
ITRCO1	I intend to recommend the use of e-government services
ITRCO2	I will recommend to my friends and family to use e-government services
ITRCO3	I will recommend e-government service in the future
ITRCO4	Based on good experience from e-government services, I will recommend its use
ITRCO5	Overall, I will continue to recommend e-government services adoption