Citizens' Readiness for e-Government Services in Tanzania

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Abstract

E-Government services make government operations and processes more transparent and more effective for citizens and businesses. They also provide a variety of benefits for the community at large such as reducing services' time and connecting businesses and citizens to government information at anytime. However, the use of e-Government services depends on the citizens' readiness and attitudes towards these services. This paper identifies the degree of the citizens' readiness for e-Government services in Tanzania. The factors which influence the citizens' readiness for e-Government services were identified. The primary data were collected using questionnaires. Then the data were processed and analyzed using the SPSS. The results show that the majority of citizens are not yet ready to adopt e-Government services, mostly because of the anticipated security threats. More time and efforts are needed to create an enabling environment for citizens' readiness to adopt e-Government services in Tanzania. The paper proposes the activities to this effect.

Keywords: *e-Government services, e-Government Maturity Models, ICT infrastructure, ICT usage, human capital, trust*

1. Introduction

E-Government is defined as the use of Information and Communication Technologies (ICT) to offer for citizens and businesses the opportunity to interact and conduct business with government by using different electronic media such as the Internet [1]. E-Government services make government operations and processes more transparent and more effective for citizens and businesses, and provide a variety of benefits for the community at large such as reducing services' time and connecting businesses and citizens to government information at anytime [2]. E-government provides different types of services to society, and its implementation depends on the government's objectives. One type of e-Government service is Government-to-Citizen (G2C) which allows citizens to access information and receive government services such as submitting tax returns, requesting identity cards, downloading documents, submitting job applications and complaints, and sending e-mail messages. Most governments

worldwide are developing more sophisticated ways to promote citizens' active participation in governmental activities, offering them more effective access to e-Government services [3].

The government of Tanzania recognizes that by using e-Government services it will be able to increase the range and quality of services in public sectors [4]. Various efforts have been made to deploy e-Government initiatives in Tanzania. In 2012 the government of Tanzania established the e-Government agency which is a semi-autonomous institution with the mandate of coordination, oversight and provision of e-Government initiatives and enforcement of e-Government standards in the public services [5]. The government of Tanzania also adopted an e-Government strategy (2009) that aims at improving efficiency in government and providing better services to citizens. The government of Tanzania conducted a situational analysis for e-Government readiness in Tanzania by examining the government itself in relation to the following: (1) institutional e-Government services arrangements; (2) human resources; (3) budgetary resources; (4) communication flows between ministries, departments, and agencies (MDAs); (5) ICT infrastructure; (6) ICT capacity levels; (7) ICT related policies; and (8) Public Private Partnerships (PPP) [4]. However, this analysis ignores the assessment of the degree of the citizens' readiness towards adoption of e-Government services.

The purpose of this paper is to identify the degree of the citizens' readiness to adopt e-Government services in Tanzania. The paper is a part of ongoing research which aims at developing a holistic secured maturity model for protecting information in e-Government services in Tanzania.

1.1 Background

Citizens' readiness is among the most important factors for adoption of e-Government services. E-Government services which are easy to be used affects positively the citizens' readiness and hence the adoption of these services. However, the ease of using e-Government services depends on how these services are developed. To guide the development of e-Government services, several

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models called e-Government Maturity Models (eGMMs) were developed by the international organizations, consulting firms, academia, and individual researchers [6]. These models outline various stages for e-Government development. For instance, West proposed a three stage model [7], Layne and Lee proposed a four stage models [8], Hiller and Belanger proposed a model with five stages [9] while Deloitte and Touche proposed a six stage model [10]. The models specifically designed to guide the implementation and development of e-Government applications in a stage-wise manner – from immature (one-way communication) to the mature (digital democracy) stage. The advantage of having a stage-wise approach is to offer governments abilities to measure the progress and also to generate momentum that could subsequently be maintained [11]. This allows public sector organizations to attract more citizens to use e-services to a point where it becomes natural, as well as securing business trust and confidence to deal with e-Government portals as part of their standard service chain operations [11].

We observe that the government of Tanzania adopts a four stage maturity model which resembles in stages with that of Gartner's maturity models. The model comprises of the following phases: (1) Digital Presence; (2) Interaction; (3) Transaction; and (4) Transformation. This section briefly describes the phases of the adopted e-Government maturity model and identifies the strengths and weaknesses of this model.

1.1.1 A Brief Description of the Model

In the Tanzanian context, e-Government evolution is expected to evolve through four key stages.

The first stage is Digital Presence. This stage involves simple provision of government information through website (static) with basic information that the citizen can access [12]. This is a one-way communication between government and citizen. Generally, the information provided by organizations at this stage is public and normally with zero security. At this stage, e-Government services identity should be verified to build trust between agencies and users. The citizens would like to be sure that they are connected to the e-Government service belonging to the administration in question [13].

The second stage is Interaction. At this stage the interaction between government and the public (Government-to-Citizens and Government-to-Businesses) is stimulated by various applications. People can ask questions via e-mail, use search engines and download forms and documents [14]. The communication is performed in two ways, but the interactions are relatively simple and generally revolve around information provision. These types of initiatives are designed to help a citizen to avoid a trip to an office or make a phone call by making commonly requested information and forms available online 24/7 [15]. However, at this stage citizens still have to go to the organizations to finalize the transaction by paying a fee, handing over evidence or signing papers.

The third stage is Transaction. At this stage public organizations provide electronic initiatives and services with capabilities and features that facilitate clients to complete their transactions in full without the necessity of visiting government offices [16]. The public can carry out their financial transactions with the government. Such services also allow the government to function in a 24/7 mode. Typical examples include services that allow the application for business licenses, passports, permits, and possibility to complete payments online. This requires higher levels of processing capability, as well as payment gateways and security implementation [17]. This stage requires secure identification related to the individual interacting with the government agency. Data access is restricted to a specific individual who is provided personal information and services [18]. Providing of personal information requires a higher level of secure channels between organization and the user. Creating services on this stage involves addressing risks involving security, privacy and financial transactions. What separates this stage from the two prior stages is the need for secure identification of the user identity [18].

The last stage is Transformation. At this stage government organizations are well joined and working together at all levels. This stage allows e-Government services users to interact with one government instead of individual government organizations [4]. Information systems are integrated, and the public can get G2C and G2B services at one (virtual) counter. This stage requires collaboration to bring together suppliers, consumers and the whole government itself into a seamless network focused on increasing value creation. At this stage the organizational boundaries in the government structure is somewhat erased or is left with no or little visibility to the users[18]. In stages 3 and 4 governments possess detailed information about citizens and businesses, which is often held in multiple offices on many different computer systems (or still in paper files) [19]. The integration of data can result in situations where the privacy of individual citizens is in danger. It is the responsibility of the government to restrict the utilization of private information, and secure such information from access by unintended parties. A government agency

should be able to authenticate another government agency that requires a service on behalf of the users, and should be able to authenticate itself near the other government agencies [20]. Organizations should have the capability of filtering service access, this is because, some agencies have the right to invoke a service while others do not, to invoke a service, the user must provide its authentication as an input [20].

1.1.2 The Strengths and Weaknesses of the Model

The adopted four stage model is straightforward and concise. However, this model misses out the political participation component and does not address the possible changes in the way decisions are made in government. In general, the model focuses on citizen-centric and partly functionality which is grounded on technology, organizational and managerial feasibility [21]. In addition, the model partly considers technical security at its transaction stage [12]. We believe that it is insecure to depend only on security measures provided at transaction stage, security measures should be considered at all stages of the maturity model. The model also proposes a sort of linear progression as e-Government evolves, generally beginning with digital presence, interactions, transactions, and finally to some form of integration (transformations). We believe that e-Government services need not necessarily follow this path. In fact, some organizations may achieve their strategic purpose at the information dissemination stage and need not go any further [22].

1.2 General Objective

The general objective of this study was to identify the degree of the citizens' readiness for e-Government services in Tanzania.

1.3 Specific Objectives

The specific objectives of this study were
  i. To identify strengths and weaknesses of e-Government maturity model adopted in Tanzania.
  ii. To identify the factors influencing citizens' readiness for e-Government services in Tanzania.
  iii. To recommend activities for improving citizen readiness for e-Government services in Tanzania.

2. Methodology

In identifying the degree of the citizens' readiness for e-Government services in Tanzania, data were collected using structured questionnaires which were then distributed to citizens whose age were 18

years old and above. We adopted Hany's conceptual framework to develop the questionnaire [23]. The desk review was conducted to identify the strengths and weaknesses of e-Government maturity model adopted in Tanzania.

2.1 Population and Sampling Method

To identify the degree of the citizens' readiness for e-Government services in Tanzania, a population of all citizens whose age were 18 years old and above was considered appropriate. According to the census report of 2012, a total number of Tanzanians above 17 years old was 22,424,397, which is 49.9 percent of the total population [24]. In order to have a fair representation of a sample, the population was stratified into three regions, namely Dar es Salaam, Mwanza and Mbeya. The criteria used for selection of research sample were: (1) a region with population of more than 2.5 million citizens, and (2) a region which is recognized by the government as a city. The sample size of the population was estimated at 400. We distributed 450 questionnaires, and 373 responses were received. The sample size of the population was calculated from the following formula [25]:

$$ n = \frac{Z^2 \times p \times q \times N}{e^2 (N-1) + Z^2 \times p \times q} \ \text{………............ (1)} $$

Where N = size of population, n = size of sample, e = acceptable margin error (the precision = 0.05), Z= Z value at 95 percent confidence level (1.96), p = sample proportion, q = 1 − p; where q= 0.5.

2.2 Profiles of the Respondents

All the respondents were 18 years old and above. It was observed that the majority of the respondents (77.9 percent) were citizens with age from 18 to 45 years old and 22.2 percent were aged 46 years old and above as presented in Figure 1.
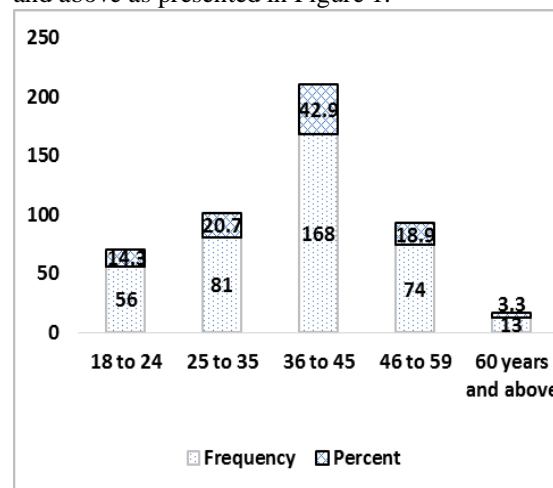

Fig. 1: The age profile of the respondents

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With regards to the gender, it was noted that the majority of the respondents (63.5 percent) were male and 36.5 were female. In this study, the majority of the respondents (32.7 percent) had a university education, 18.9 percent of the respondents had a college education, 11.0 percent of the respondents had advanced secondary school education (A-Level), 24.2 percent of the respondents had ordinary secondary school education (O-Level), and 13.3 percent of the respondents had primary school education. Figure 2 shows the respondents' educational profile.
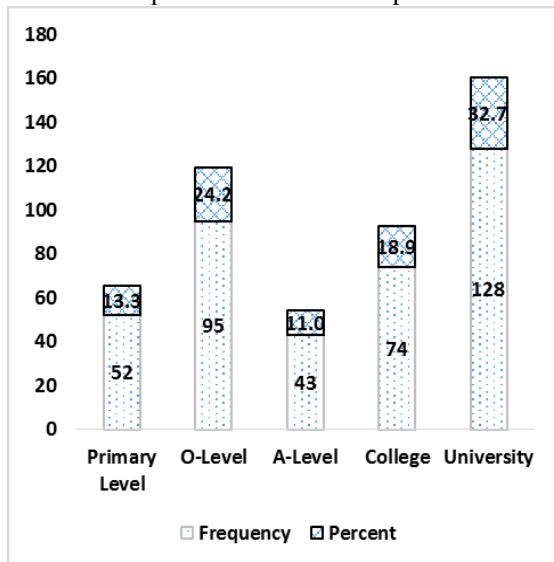

Fig. 2: Educational profile of the respondents

2.3 Data Collection

Questionnaires were used to collect primary data. To ensure validity of the questionnaires, a pilot study was conducted prior distributing questionnaires to respondents. Forty questionnaires were delivered to the respondents, but only 19 responded. Necessary improvements to the questionnaire were done, and the improved version of the questionnaires was distributed to our sample population. Since there were no major changes required to incorporate in the questionnaire, responses received from the pilot study were also included in the final analysis, this implies that the total responses received were 392.

2.4 Reliability and Goodness of Fit Measurement.

The analysis of the internal consistence of the questions was conducted by doing a reliability test by using Statistical Package for Social Sciences (SPSS). The calculated Cronbach's alpha was 0.793 and thus was found suitable. To assess goodness of fit for all research questions, a Chi-square test was conducted, and the results have shown statistical significance.

2.5 Data Processing and Analysis

The content analysis technique was used for processing and analyzing descriptive data. SPSS and Microsoft Excel were used for data analysis. Various analysis techniques included descriptive statistics, especially frequency and a Chi-square test was used to measure both goodness of fit and relationship between variables. The results were presented using charts.

3 Results and Discussions

3.1 Citizens' readiness for e-Government services in Tanzania

This study assessed the degree to which citizens are ready to use e-Government services in Tanzania. This was done through identification and analysis of citizen specific factors influencing their readiness for using e-Government services. The identified factors were as follows: (1) ICT infrastructure; (2) ICT usage; (3) human capital; (4) citizens' awareness on e-Government services; and (5) Trust and confidence in e-Government services security. We received 392 responses, and these responses were processed and analyzed by using the Statistical Package for Social Sciences (SPSS).

3.1.1 ICT Infrastructure

ICT infrastructure relates to the elements of ICT that need to be available to citizens if they are to use e-Government services. ICT infrastructure includes basic access infrastructure which consists of, among other factors, telephone lines, personal computers, Internet accessibility and penetration in rural areas, the speed available for the public to access the Internet and the cost of the services provided in comparison to citizens' income [26].

The analysis of the collected data shows that the majority of the respondents (61.3 percent) have mobile phones, and 19.7 percent of the respondents have personal computers. This implies that there is a high mobile phone subscription compared to availability of personal computers, unfortunately most of the e-Government services are designed primarily to be utilized through the Internet and using computers. This situation creates an access obstacle, therefore low adoption of e-Government services. We recommend the government to make more effort to reduce this weakness by supporting the design of e-Government services which would be delivered through both mobile phones and computers. It was also observed that 38.5 percent of the respondents were not in a position to know whether they were satisfied with the Internet speed or not (this includes 22.4 percent of the respondents who never access the Internet), while the majority of the respondents (52.8 percent) were

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not satisfied, and only 8.7 percent were satisfied. This situation may be caused by the low bandwidth capacity. We recommend organizations to enhance the Internet speed by increasing the bandwidth capacity. Figure 3 shows the distribution of responses on the Internet speed satisfaction.
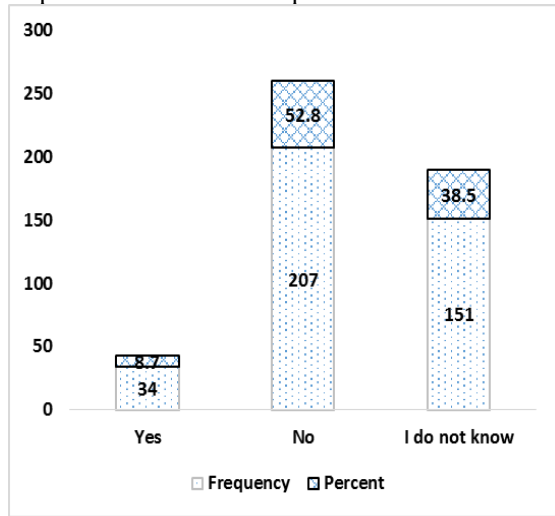

Fig. 3: The distribution of responses on the Internet speed satisfaction

The analysis of the collected data shows that only 10.2 percent were satisfied with the technical quality of the e-Government services such as download capacity while 47.2 percent were not satisfied. The implication of this situation is that there is a continuous delay in responding requests of e-Government service users, which may prevent citizens from using the e-Government services. Therefore, we recommend the government to allocate a reasonable budget which enables the public organizations to acquire a satisfactory bandwidth capacity which improves the download capacity and speed of e-Government services delivery. Figure 4 shows the distribution of responses on the technical quality of the e-Government services satisfaction.
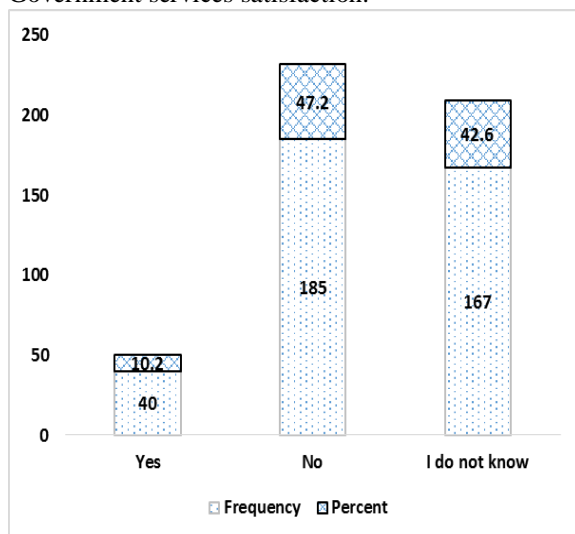

Fig. 4: The distribution of responses on the technical quality of the e-Government services satisfaction

Finally, it was observed that the Internet services are neither widely spread nor known by majority especially in semi-urban and rural areas. The low penetration of only 11.0 percent is believed to be caused by two major reasons: ignorance and non-availability of services [27]. We recommend the government to promote the Internet usage by providing technical and financial assistance for the establishment of community telecentres, public Internet access centers, Internet cafes and ICT clubs which could be run and funded by private and public sectors jointly.

3.1.2 ICT Usage

ICT usage reflects how citizens use computers and the Internet in their daily lives. The analysis of the collected data shows that 10.2 percent of the respondents access the Internet daily (at least once), 5.4 percent access the Internet more than once every day, 16.1 percent access the Internet once a week, the majority of the respondents (25.8 percent) access the Internet more than once every week, 20.2 percent access the Internet once a month, and 22.4 percent of the respondents never accessed the Internet. This shows that approximately 25 percent of the respondents never accessed the Internet, and approximately 25 percent of the respondents accessed the Internet rarely (once a month). This shows that most of the citizens were not frequently using the Internet services including e-Government services. This implies that the majority of the citizens resists in the adoption of digital technology. We recommend the government to make more efforts to sensitize citizens on the use the Internet services. Figure 5 shows the distribution of responses on the frequency of accessing the Internet.
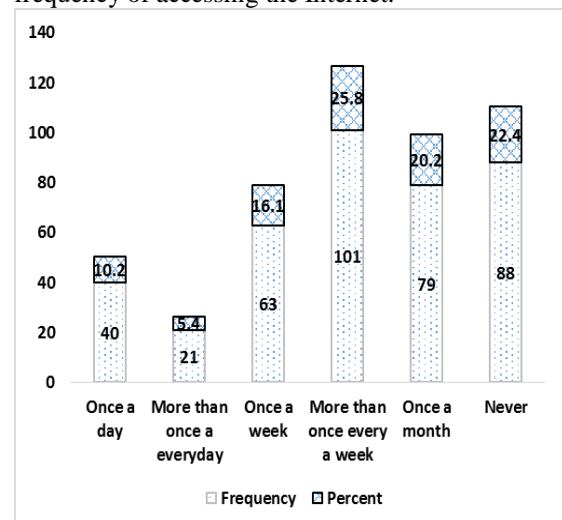

Fig. 5: The distribution of responses on the frequency of accessing the Internet

It was also observed that the majority of the respondents (64.0 percent) never used any e-Government services while 36.0 percent used at

least one e-Government service. This shows that there is a lack of either information about available e-Government services to citizens or proper ICT infrastructure. Thus, we recommend the government to publicize the available e-Government services and improve the ICT infrastructure. Figure 6 shows the distribution of responses on the use of e-Government services.
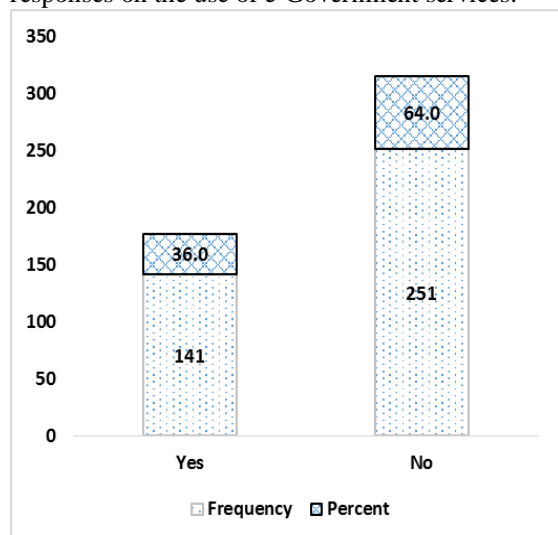

Fig. 6: The distribution of responses on the use of e-Government services

It was observed that 32.7 percent of the respondents were satisfied with the information received from the e-Government services, and 5.4 percent of the respondents were not satisfied, while the majority of the respondents (62.0 percent) were not in a position to know whether they were satisfied with the information received from the e-Government services or not. This can be explained by the fact that 64.0 percent of the respondents never used e-Government services. It was also observed that the majority of the respondents (59.4 percent) did not know that using e-Government services allow them to access more government services than would otherwise be possible, while 16.1 percent accepted the fact and 24.5 percent rejected. This situation implies that most of the respondents never used any e-Government services, which resulted to be in a position of not knowing the advantages of using e-Government services. The analysis of the collected data shows that most of the respondents (65.6 percent) prefer using the face to face service delivery while 34.4 percent prefer online service deliver. In Tanzania, preference for face-to-face communication is affected by the cultural practices whereby citizens prefer to discuss, request, and contact on a face-to-face basis, they are also used to contact the government that way. We recommend organizations to publicize and sensitize citizens to use e-Government services in order to improve efficiency of services delivery. Using e-Government services enable cost savings for

citizens and support service delivery 24/7 mode. Figure 7 shows the distribution of responses on preference of mode of service delivery.
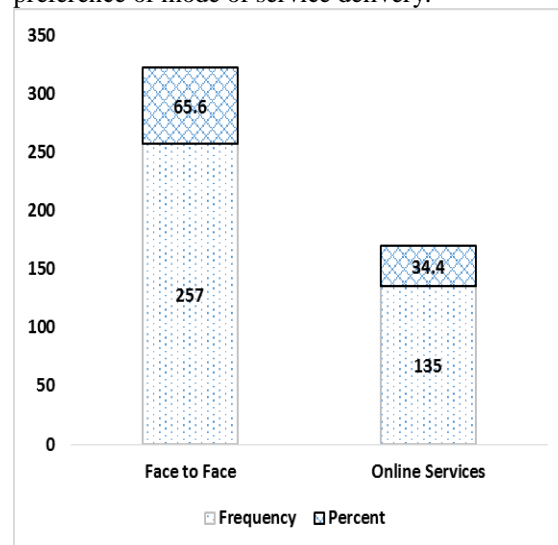

Fig. 7: The distribution of responses on preference of mode of service delivery

3.1.3 Human Capital

Human capital relates to citizens' education and knowledge on how to use computers and the Internet. The analysis of the collected data shows that 23.2 percent of the respondents were computer illiterate, 18.9 percent had poor computer knowledge, 37.8 percent had average computer knowledge, 17.6 percent had good knowledge of computer and only 2.6 percent of the respondents were computer experts. This shows that less than 20 percent of the respondents had good knowledge of computer. We recommend government to reduce this weakness by providing students at schools and universities with ICT skills at different stages of the education system. Figure 8 shows the distribution of the respondents' levels of computer literacy.
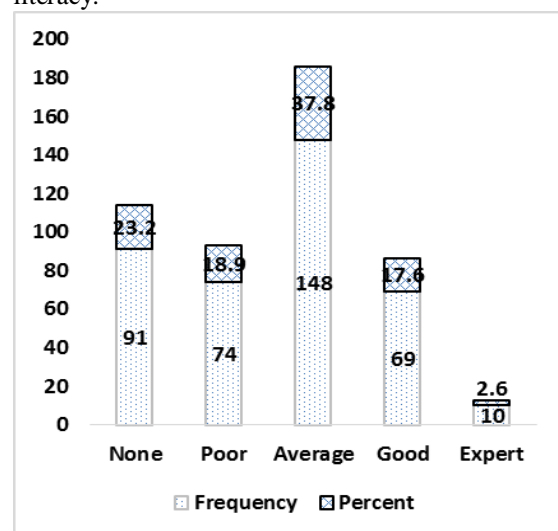

Fig. 8: The distribution of the respondents' levels of computer literacy

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3.1.4 Citizens' Awareness on e-Government Services

The success and acceptance of e-Government services initiatives depend on citizen readiness to use the provided services. Citizens' awareness towards the available e-Government services is an important factor which affects positively the adoption of these services. The analysis of the collected data shows that the majority of respondents (35.5 percent) were not aware of e-Government services provided by public organizations, 16.1 percent had poor awareness, 27.0 percent had average awareness, 13.5 percent had good awareness on e-Government services, and only 7.9 percent are e-Government services experts. This implies that approximately 52 percent of the respondents were unaware of the e-Government services. We recommend the government to make intensive advertising campaigns for the e-Government services delivered by public organizations in all mass media channels in order to make citizens aware of and to provide detailed knowledge about the services. Figure 9 shows the distribution of the respondents' levels of e-Government services awareness.
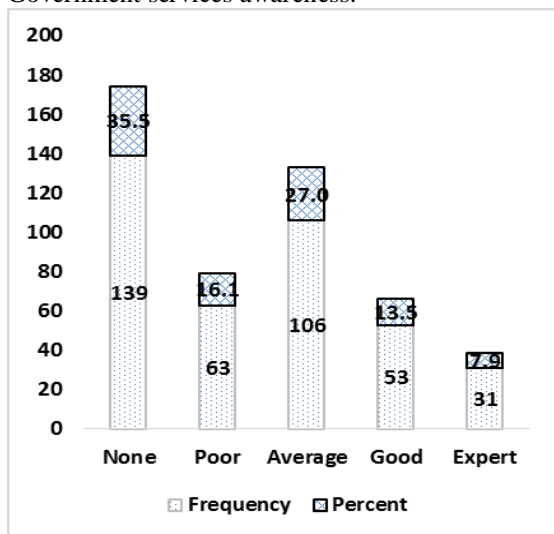

Fig. 9: The distribution of the respondents' levels of e-Government services awareness

It was also observed that while the majority of the respondents (58.9 percent) declared the importance of implementing e-Government services in Tanzania, 34.9 percent did not know why implementing of e-Government services was important, and only 6.1 percent declared that there was no need of implementing e-Government services in Tanzania.

3.1.5 Trust in e-Government services

E-Government services must build trust with users (citizens, businesses and government). Citizens' trust plays a very vital role in the adoption and acceptance of e-Government initiatives [28]. Users are unlikely to use e-Government services without a guarantee of trust. Trust makes citizens comfortable sharing personal information, effecting online government transactions, and following e-Government advices [29]. The analysis of the collected data shows that only 15.8 percent of the respondents were satisfied with the information security measures provided by e-Government services providers, while 22.2 percent of the respondents were not satisfied with the security measures used to protect e-Government services, and 62.0 percent were not in a position to know whether they were satisfied or not with the security measures used to protect e-Government services. This implies that majority of the respondents were not confident with the information security measures used to protect e-Government services. We recommend public organizations to make more efforts by implementing both technical and non-technical security measures in order to protect e-Government services and gain citizens' trust towards e-Government services. Figure 10 shows the distribution of responses on satisfaction of security measures.
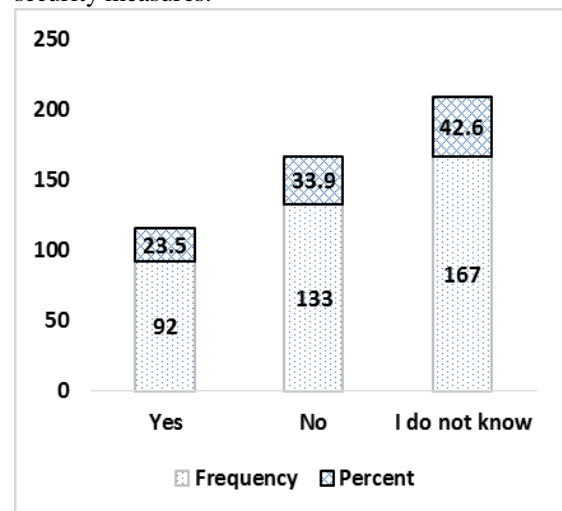

Fig. 10: The distribution of responses on satisfaction of security measures

4. Recommendations

Based on the findings from this study, we recommend the following activities to be implemented in order to improve citizens' readiness to adopt e-Government services in the country:

1. It was observed that in Tanzania there is a high mobile phone subscription (61.3 percent) compared to the availability of personal computers (19.7 percent). We recommend government to make more effort by supporting the design of e-Government services which would be delivered through both mobile phones and personal computers.

43

2. The results show that the majority of the respondents (47.2 percent) were not satisfied with the technical quality of the e-Government services such as download capacity. Therefore, we recommend the government to allocate a reasonable budget which enables organizations to acquire a satisfactory bandwidth capacity, which improves the download capacity and speed of e-Government service delivery.

3. It was observed that the Internet services are neither widely spread nor known by the majority, especially in semi-urban and rural areas. We recommend government to promote Internet usage by providing technical and financial assistance for the establishment of community telecentres, public Internet access centers, and encouraging the private sector to establish public Internet cafes, and establishing ICT clubs which could be run and funded with private and public sector cooperation.

4. The results show that 20.2 percent of the respondents access the Internet once per month, and 22.4 percent never accessed the Internet, which means the majority of the respondents were not frequently used the Internet services including e-Government services. We recommend government to make more efforts to sensitize citizens to use the Internet services .

5. The majority of the respondents (64.0 percent) never have used any e-Government services due to a lack of either information about available e-Government services to citizens or proper ICT infrastructure. Thus, we recommend the government to widely publicize the available e-Government services and improve the ICT infrastructure.

6. The results show that the majority of the respondents (65.6 percent) would prefer using the face-to-face service delivery. We recommend organizations to publicize and sensitize citizens on the use of e-Government services in order to improve efficiency of services delivery. Using e-Government services enable cost savings for citizens and suppor service delivery 24/7 mode.

7. It was observed that less than 20 percent of the respondents had good knowledge of computer. We recommend the government to eliminate this weakness by providing students at schools and universities with ICT skills.

8. The results show that approximately 52 percent of the respondents were unaware of the e-Government services. We recommend the government to make intensive advertising campaigns for the e-Government services delivered by public organizations in all mass media channels in order to make citizens aware of and to provide detailed knowledge about the services.

9. It was observed that only 15.8 percent of the respondents were satisfied with the information security measures taken by e-Government services providers. We recommend these organizations to make more efforts by implementing both technical and non-technical security measures in order to protect e-Government services and gain citizens' trust towards e-Government services.

5. Conclusions

This study has identified the degree to which citizens are ready to use e-Government services in Tanzania. Factors influencing citizens' readiness were identified and analyzed. The identified factors include the following: ICT infrastructure, ICT usage, human capital, citizens' awareness of e-Government services, and (5) trust and confidence in e-Government services security. Data were collected through questionnaires, processed and analyzed using the SPSS software. The overall results show that majority of citizens are not yet ready to adopt e-Government services because of the following reasons: (1) improper and limited access to the ICT infrastructure especially in rural areas; (2) citizens' resistance towards adopting digital technology; (3) lack of citizens' awareness about available e-Government services; (4) citizens' preference of using the face-to-face service delivery; (5) poor ICT skills; and (6) absence of trust and confidence towards the information security measures used to protect e-Government services. We conclude that more time and efforts are needed to create enabling environment for successful citizens' readiness to adopt e-Government services in the country.

Further research will entail the development of a secure e-Government maturity model for protecting information in e-Government services in Tanzania.

References

[1] T. Almarabeh and A. AbuAli, "A general framework for e-government: definition maturity challenges, opportunities, and success," *European Journal of Scientific Research,* vol. 39, pp. 29-42, 2010.

[2] E. Liikanen, "E-government and the European Union," *The European Journal for the Informatics Professional (UPGRADE),* vol. IV, No. 2, pp. 7-10, 2003.

[3] M. O. Ahmad, *et al.*, "Factors influencing the adoption of e-government services in Pakistan," in *Proceedings of the 9th European, Mediterranean & Middle Eastern Conference on Information Systems*, 2012.

[4] President's Office - Public Service Managements, "Tanzania e-Government Strategy," ed, 2012. Retrieved on 10th February 2013 from the website www.utumishi.go.tz

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WWW.ACSIJ.ORG

[5] Presidents Office, Public Service Management, "Strategic Intent 2012/13 - 2016/17 e-Government Agency ", ed, 2012. Retrieved on 21st January 2013 from the website www.ega.go.tz

[6] P. Upadhyaya, *et al.*, "Information Security Framework for e-Government Implementation in Nepal," *Journal of Emerging Trends in Computing and Information Sciences,* vol. 3, No. 7, 2012.

[7] D. M. West, "E-Government and the Transformation of Service Delivery and Citizen Attitudes," *Public administration review,* vol. 64, pp. 15-27, 2004.

[8] K. Layne and J. Lee, "Developing fully functional E-government: A four stage model," *Government Information Quarterly,* vol. 18, pp. 122-136, 2001.

[9] J. S. Hiller and F. Belanger, "Privacy strategies for electronic government," *E-government,* vol. 2001, p. 173, 2001.

[10] K. Siau and Y. Long, "Synthesizing e-government stage models–a meta-synthesis based on meta-ethnography approach," *Industrial Management & Data Systems,* vol. 105, pp. 443-458, 2005.

[11] Z. Irani, *et al.*, "Transaction stage of e-government systems: identification of its location and importance," in *System Sciences, 2006. HICSS'06. Proceedings of the 39th Annual Hawaii International Conference on*, 2006, pp. 82c-82c.

[12] G. Karokola and L. Yngström, "Discussing E-Government Maturity Models for the Developing World-Security View," in *ISSA*, 2009, pp. 81-98.

[13] M. Sellami and M. Jmaiel, "A Secured Service-Oriented Architecture for E-government in Tunisia," *ReDCAD research unit National School of Engineers of Sfax,* 2007.

[14] H. Yousefi-Azari, "Implementing e-Government in Iran " *Proceedings of the 8th European Conference on Information Warfare and Security,* pp. 696-702 2009.

[15] J. W. Seifert, "A primer on e-government: Sectors, stages, opportunities, and challenges of online governance," 2003.

[16] J. Yonazi, "Adoption of Transactional Level e-Government Initiatives in Tanzania," 2013.

[17] C. Wagner, *et al.*, "Enhancing e-government in developing countries: managing knowledge through virtual communities," *The Electronic Journal of Information Systems in Developing Countries,* vol. 14, 2003.

[18] A. Persson and G. Goldkuhl, "Stage-models for public e-services-investigating conceptual foundations," in *2nd Scandinavian Workshop on e-Government, Copenhagen*, 2005.

[19] M. Backus, "E-governance in Developing Countries," *IICD Research Brief,* vol. 1, p. 2001, 2001.

[20] Z. I. Saleh, *et al.*, "A Framework for an E-government Based on Service Oriented Architecture for Jordan," *International Journal of Information Engineering & Electronic Business,* vol. 5, 2013.

[21] C. Baum and A. Di Maio, "Gartner's four phases of e-government model," *Gartner Group,* 2000.

[22] J. F. Affisco and K. S. Soliman, "E-government: a strategic operations management framework for service delivery," *Business Process Management Journal,* vol. 12, pp. 13-21, 2006.

[23] H. A. A. Ismail, "Citizens' readiness for e-government in developing countries," PhD Thesis, School of Computing Science, Middlesex University, London, UK, 2008.

[24] Tanzania National Bureau of Statistics (NBS), "Population Distribution by Age and Sex ", Government Report, ed, 2013. Retrieved on 18th April 2014 from the website www.nbs.go.tz

[25] C. Kothari, *Research methodology: methods and techniques*: New Age International, 2004.

[26] V. Ndou, "E-government for developing countries: opportunities and challenges," *The Electronic Journal of Information Systems in Developing Countries,* vol. 18, 2004.

[27] Tanzania Communications Regulatory Authority (TCRA), Internet and Data Services in Tanzania A Supply-Side Survey," 2010. Retrieved on 24th June 2013 from the website www.tcra.go.tz

[28] S. C. Srivastava and T. S. Teo, "A framework for electronic government: evolution, enablers and resource drainers," in *Proceedings of the Eighth Pacific Asia Conference on Information Systems*, 2004.

[29] H. Alsaghier, *et al.*, "Conceptualising Citizen's Trust in e-Government: Application of Q Methodology," *Electronic journal of e-government,* vol. 7, 2009.

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