

Assessing the Usage of e-Government Systems in Zambia: A Government Employee Perspective

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Abstract

This paper presents the utilization of e-Government Systems by government employees in Zambia. The DeLone & McLean model used in this study was modified to create an e-Government Systems Assessment model. An online questionnaire was distributed to 32 line ministries targeting government employees in Lusaka who use e-Government systems. A sample of 90 government employees were selected using random sampling technique. Data was analysed using descriptive and factor analysis. The study confirmed that System Quality was the most valued among the quality dimensions. System Quality and Information Quality had a huge impact on User Satisfaction. It was found that Service Quality did not meet User Satisfaction. Additionally, it was discovered that Intention to Use/Use of the e-Government systems by government employees was moderate. On the overall, the respondents were satisfied with e-Government systems, however, the percentage number of those who were not sure about the e-Government systems was high. The study recommends that the e-Government Coordinating Division should enhance the quality of service that users of e-Government systems receive.

Keywords: e-Government systems • DeLone and McLean model • e-Government system assessments model • service quality • System quality • Information quality

Introduction

Information and communication technology (ICT) have been identified as a substance for socio and economic development thereby promoting competitiveness and to be an enabler of creating good governance in the organisations. However, there are several challenges regarding access to and utilisation of ICT in Zambia. ICT infrastructure, equally private and public, is inadequate and fragmented, resulting in poor connectivity and communication. Further, the public sector, in particular, lacks adequate human resource in the area of computing and information technology [1].

The Government of Zambia formed the Centre of Excellence for e-Government and Information Communication and Technology (CEEIGICT) (an e-Government Division within Cabinet Office) in 2015 to coordinate the implementation of the e-Government Programme. The CEEIGICT which was later renamed as SMART Zambia Institute (SZI) was mandated to spearhead the coordinated implementation of ALL the e-Government and ICT Projects that aim to build a service centred, citizen inclusive and development oriented smart society that use ICTs. The SZI takes particular cognisance of the fact that the transition from the manual traditional delivery of services in Ministries, Provinces, and Spending Agencies (MPSAs) to a fully-fledged provision of online e-Service will require that both ICT Staff and all public service employees undergo responsive change management and stimulate a corresponding faster rate of adoption of applications by the majority citizens.

Since the creation of SZI, several initiatives have been undertaken within the public sector. So many projects have been implemented such as Integrated Financial Management Information System (IFMIS), Payroll Management and Establishment Control (PMEC) and building of Government Wide Area Networks (GWAN) among other e-services and systems. Critical applications and services such as Integrated Financial Management Information Systems (IFMIS) and Shared Services such as Outlook, Skype for Business and SharePoint among others are running on

the GWAN. Unified internet is transmitted from the Zambia National Data Centre (ZNDC) to the connected institutions. SZI manages the network infrastructure and services on the GWAN platform including provision of unified internet services.

The purpose of the study was to assess the usage of e-Government systems in Zambia; A government employees' perspective. At present, the majority of research studies and projects are on government to citizen (G2C) type e-Government, which focuses on the provision of Web based services to citizen. Accordingly, research on government to government (G2G) e-Government has been minimal. This study examined studies centred on e-Government as well as those exploring G2G. Furthermore, in practice, efforts have been concentrated over the years on building websites and portals to provide services to the citizens. According to the UN, the predominant focus of global e-Government initiatives had been on G2C, and this meant that platforms for the delivery of those services were isolated and duplicated. Specifically, the research focused on G2G of e-Government and further the focus was on the e-Government systems perspective. The research looked at Integrated Financial Management Information System (IFMIS) and shared services such as Microsoft Outlook, Skype for Business and SharePoint which are effective **communication** systems and methods of **collaboration** of individuals working towards one common goal [2].

The rest of the sections are divided as follows: the next section discusses related work on assessing e-Government systems using Information Systems. Section III is literature review. Section IV, gives the methodology, while section V shows the results and discussions. The conclusion is given in section VI.

Related Work

The authors in conducted a study in Algeria to assess impacts of system quality, service quality, information quality, digital skills, service awareness, access means, trust, and perceived usefulness on expressed satisfaction about e-Government systems. Their findings indicated that the dimensions system, information, and service qualities had significant and positive impacts on users' satisfaction [3].

Ojo did a study in Nigeria to validate the DeLone and McLean information system (IS) success model in the context of a hospital information system (IS) in a developing country. System quality and use were found to be important measures of hospital information system success. Stefanovicet al empirically assessed the model for measuring the success of e-Government systems which comprised constructs from the updated DeLone and McLean

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(D&M) IS success model which included the demographic conditions. Their analysis showed that information quality, service quality and service quality had a positive impact on the intention to use/use, and that only system quality had a significant effect on user satisfaction. Intention to use/use had a positive and direct effect on user satisfaction [4,5].

Nwone conducted a study in Nigeria to examine the influence of IS characteristics that is; system quality, information quality and service quality derived from the updated D&M (2003) IS success model. The results showed that system quality, service quality, information quality, and technological/infrastructural factor significantly influenced postgraduate students' satisfaction of the web portal. Urbach & Muelle conducted a study to give a synopsis of the current state of the research on the IS Success Model. They argue that D&M IS Success Model is fully adapted to a specific research problem using newly developed constructs that are similar to those of the original model. It offers a concise entry point to the theory's background and its application. They argue that work using the D&M IS Success Model will remain popular in the years to come. Its update gives a strong argument for the model's accuracy and thriftiness and many studies using the model provides a broad basis of empirical support and proven measures. The user satisfaction (US) success dimension comprises the user's level of satisfaction when applying an IS. It is said to be one of a critical measure of IS success. Assessing US becomes especially useful, when the use of an IS is compulsory and the amount of use is not an appropriate indicator of the systems success [6,7].

Gupta *et al* conducted a study to evaluate e-Government programmes which focused on the various parameters for evaluating the success of e-Governance projects. They reckon that usage of e-Government services determines the return on investment. They recommend that people's awareness concerning e-Government services must be increased widely to ensure higher utilisation and maximise the return on investment. The authors in conducted a study in Europe to consider change management (CM) process as a continual improvement process to enhance the usability of e-Government services. E-Government systems are subject to a continual change. It is clear that ad hoc management of changes in e-Government might work only for particular cases. To avoid drawbacks in the implementation of systems, the CM must be treated in a more systematic way. CM is a continual improvement process. To improve the usability of e-Government services with respect to the needs of users. Livari carried out a study in Finland to tests the model of information systems success proposed by D&M using a field study of a mandatory IS. The results showed that system quality and information quality are significant forecasters of user satisfaction with the system, but not of system use. System quality was as well a significant forecaster of system use. User satisfaction was found to be a strong forecaster of individual impact, whereas the influence of system use on individual impact was insignificant [8-10].

Almutairi and Subramanian conducted an empirical application of the D&M Model in the Kuwaiti Private Sector. Certain direct associations between the variables in the original D&M model were supported from initial correlation analysis. Subsequent regression analyses confirmed these associations. Information quality and system quality impact user satisfaction significantly. System usage has a significant influence on individual impact. DeLone and McLean developed an IS success model in 1992 and updated it in 2003. "System Use" is a critical dimension of IS success measurement. Actual use measures should be preferred to self-reported use measures. Also, usage measures should capture the richness of use as a system phenomenon including the nature, level, and appropriateness of use, and should not simply measure the frequency of use. Cohen conducted a study that looked at the satisfaction of users of systems with their contact experience of citizens using the internet to contact government [11-13].

Sterenberg developed a conceptual framework grounded upon Service Dominant Logic to provide a perspective for evaluating systems. Based on this framework, it is argued that value is created at the intersection of service exchange and that this value is additive across the broader service system within which exchange takes place—the service ecosystem. The contribution of the framework is to help governments in making multifaceted IS portfolio

investment decisions. Mullanyet *al* suggested a practical instrument for assessing US, despite the lack of positive factors assessed. Other factor-based instruments may be unreliable, since they can omit factors that are important to the user or include factors which are of no significance to the user [14,15].

Literature Review

Theoretical framework

The theoretical framework is used to support the logic for managing the research. Literature helped the study to discover that the problem to be investigated had its roots in various theories that had been developed from different perspectives [16].

This study borrowed the concept to develop its model from DeLone and McLean who created their first model in 1992 there after updated it in 2003. The DeLone and McLean (D&M) is an IS theory which aims at offering a comprehensive understanding of IS success by identifying, and describing the interfaces among the six most important dimensions of success along with which IS are commonly assessed. These dimensions are: (1) system quality, (2) information quality, (3) service quality (4) intention to use/use, (5) user satisfaction and (6) net benefit [12]. Figure 1 is a D&M (2003) IS Success Model.

The arrows in Figure 1 show the relationships amongst the success dimensions. Examining its constructs and their interrelationships, the model could be interpreted as: an IS system is measured in terms of information quality, system quality, and service quality; these qualities affect subsequent use or intention to use and user satisfaction. Some benefits could be accomplished by utilising the system. The net benefits can influence positively or negatively user satisfaction and the further use of the IS. DeLone and McLean modified their first model and published an updated version. Researchers and academicians are encourage to develop the model further and help to continue its progression [7,12].

The D&M model has been extensively been used by IS researchers for understanding and measuring IS success. The components of D&M, IS success model are described below:

System quality: The desired attributes of an IS, such as; user-friendliness, system availability, system dependability, ease of learning and system features of intuitiveness, intricacy, flexibility, and very minimal down time [12].

Information quality: The desired attributes of the system outputs such as, management reports and Web pages. Example given; relevance, accuracy, understandability, succinctness, inclusiveness, currency and timeliness [5].

Service quality: The quality support that the users of the system

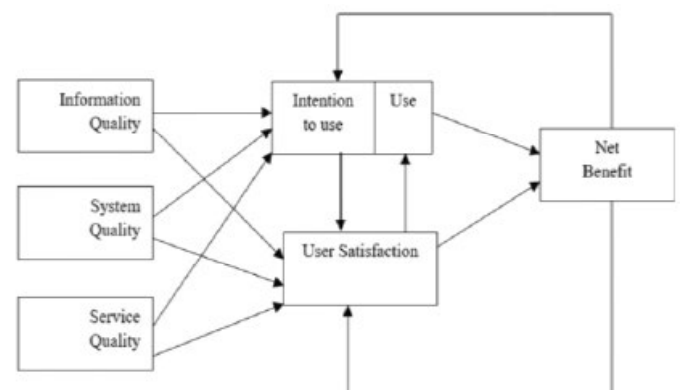


Figure 1. DeLone & McLean IS Success Model.

Source. [12].

receive from the Information Systems (IS) departments and Information Technology (IT) support personnel. For instance responsiveness, correctness, dependability, technical competence, and receptivity of the personnel staff [3].

System use: The extent and approach in which staff and clients utilize the abilities of an IS. Such as measure of utilisation, frequency of use, kind of use, relevance of use, degree of use, and intention of use [4].

User satisfaction: Consumer’s level of satisfaction with reports such as web sites, and support services [13].

Conceptual framework

According to Kumar, a conceptual framework is a foundation of a research problem. It stems from the theoretical framework and usually focuses on the sections which become the basis of study. Whereas the theoretical framework consists of the theories or issues in which study is embedded, the conceptual framework describes the aspects selected from the theoretical framework to become the basis of enquiry. The conceptual framework grows out of the theoretical framework and relates to the specific research problem [16].

To assess the usage of e-Government systems in Zambia, the study drew on the works of [12] (D&M) model. The suggested model is based on the review of previous research results [3,5-7]. Their proposed assessment is in line with the relevant literature research. The reason for adopting this framework is that it fits into the context of the research title of this study.

Using the model, the study constructed its own model to assess the utilization of e-Government systems by government employees. All the constructs were retained except for Net benefit which was dropped to meet the objective of the study. The constructs obtained from this model were system quality, information quality, service quality and demographic conditions as independent variables whilst Intention to use/use, change management and user satisfaction as dependent variables. The resultant conceptual model in Figure 2 is an e-Government Systems Assessment model adapted from IS success model [12].

This study assumes that user satisfaction of an IS means practical experience of use of the system, net benefit is tantamount to user satisfaction. Urbach & Mueller, state that “Measuring user satisfaction come to be useful, when the use of an IS is mandatory, and the amount of use is not a suitable indicator of systems success” [7]. Some e-Government systems mentioned in this study are mandatory for government employees to use such as government e-Mail MS Outlook and IFMIS whereas skype for business and SharePoint are optional, hence intention to use/use was maintained.

The objective of the study was to assess the utilization of e-Government Systems by government employees. In order to meet this objective, the study evaluated the government employees’ general satisfaction with the e-Government applications. A dimension “Change Management (CM)” was introduced to measure awareness, training and ability to use system. Change management factor was added as one of a dependent variable that could influence user satisfaction.

Components of the e-Government assessment model

System quality and user satisfaction: Nwone, found a strong support for the interrelationship between system quality and user satisfaction [6]. The functionality of a management information system for example, which is one measure of system quality, has been found to be significantly related to user satisfaction [10]. For knowledge management systems, system quality was also found to be strongly related to user satisfaction. For e-Government systems, system quality, measured as user friendliness and usability, is significantly related to user satisfaction in [5] study. Researchers have also examined more general IS and found a strong relationship between system quality and user satisfaction using a variety of measures and IS. The variables that were used for this dimension were; ‘user friendliness’ and ‘desired services’.

Information quality and user satisfaction: The association between information quality and user satisfaction is firmly supported in the literature. Studies have found a consistent association between information quality and user satisfaction [5]. This study aimed at finding a significant relationship between measures of information quality and user satisfaction. The following variables were used for this dimension; ‘reliability’, ‘sufficient’, ‘precise’, ‘accurate’ and ‘information that fit users’ needs.

Service quality and user satisfaction: Service quality as defined by is the consequential outcome of a comparative analysis between the anticipated service and its real performance judged by the end users. Consequently, if the users of the system recognize that a delivered system does not meet their expectations then the implemented system may not be a desired system. DeLone and McLean emphasized that service quality has significant influence on users’ satisfaction. Literature reviews that e-Government success depends highly on service quality and how user centered they are. Cohen stated that e-Government services were found to significantly influence expressed satisfaction after analysing internet use as a mean of communication by American people with their government (Figure 3) [3,12,13].

In this study, the variables used to measure service quality were ‘government employees are ready to help’, ‘systems are secure and protect privacy’, ‘availability of systems’, ‘provides individual attention’, and ‘understands specific needs’. Service quality measured the gap between the people’s expectations and the quality of the received service.

Demographic conditions and intention to use/use

The demographic characteristics include age in years, gender, years in work experience, institutions and job position of the government employee. The original and updated D&M IS Success model do not have demographic

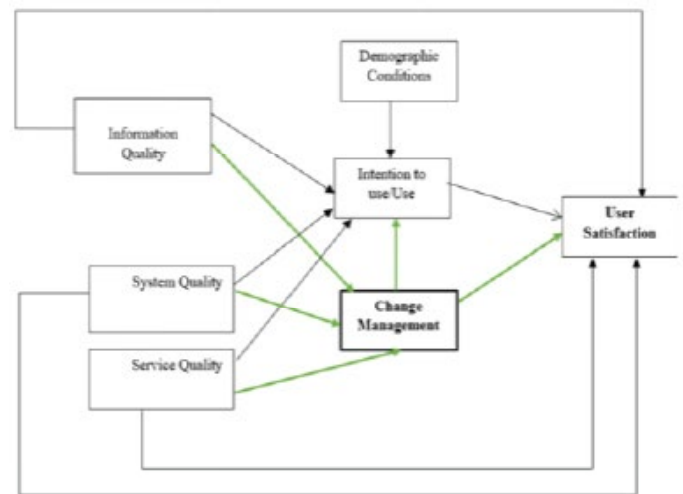


Figure 2. e-Government Systems Assessment Model.



Figure 3. Performance of e-Gov Systems in terms of System Quality.

conditions (DC) as variables to measure IS Success. The study obtained the concept of DC. Previous studies proved the effects of DCs in e-Government system use. Drawing from empirical results, found that DCs have a positive impact on intention to use/use of an e-Government system's employees.

Intention to use/use: The dimension intention to use implies the extent where an IS is utilised by its users. By assessing the usage of an IS is a wide notion that could be considered from several perceptions. If there should arise an occurrence of voluntary use, the actual use of an IS could be suitable success measure. Literature reviews that previous studies measured use objectively by capturing the connect time, the functions of the systems used, or the number of times a system is utilised. As the frequency a system is used is seemingly not a sufficient success measure, other research studies employed subjective measures by probing users about their perceived use of a system. Stefanovic state that when the intention to use/use of an e-Government system is higher, user satisfaction (US) will increase thus direct effect. Consequently, the use of the system, through a direct effect on user satisfaction, can also affect the success of these systems. Due to difficulties in interpreting the dimension 'Use', suggest 'Intention to Use' as an alternative measure to 'Use' in certain situations [5,7,12].

In this study, the variables used to measure intention to use/use were; 'frequency of use' and 'dependency'.

Change management and user satisfaction: Change Management (CM) was a new construct included on the e-Government assessment model. CM is the process, tools and techniques used to manage the people in an organization on how best they can adapt to change that is being introduced and thereby adding value. With the execution of e-Government in Zambia, there is a lot of change happening. People need to be managed on how to accept the changes that are being introduced in the country [17].

For e-Government initiatives to succeed, in addition to modernising the front office, attention should be paid to streamline, re-organise and support the back-office processes of public administrations that provide e-Government services to citizens [9]. Change management (CM) should have a positive effect on User Satisfaction. When users receive service awareness and are trained in the use of systems, they will have a satisfaction on the use of systems. The variables that were used for this dimension were; 'awareness', 'training', 'makes job easier' and 'usefulness'.

User satisfaction: According to [12] user satisfaction (US) is the general concept the users of the systems have about the e-Government systems. US is the dimension that describes the attitudes that users have towards the systems that they use. It measures the government employees' fulfilment with the e-Government systems in terms of satisfaction with the e-Government systems, how users perceive quality, and whether they have fulfilled expectations on e-Government systems.

Research Methodology

A descriptive survey design was used to assess the usage of e-Government systems in the government of Zambia. The population for the study comprised government employees who use e-Government system from all the government line ministries and institutions. **It was from these government employees where a sample population for the study was randomly selected.** The study population for the questionnaires was one hundred and twenty (120) expert respondents in Accounts, Human Resource and Administration, Planning and ICT Departments from all the thirty-two (32) line ministries and institutions in Lusaka.

A random sampling technique was used to select 120 respondents from all the 32 government institutions. A self-structured questionnaire using the e-Government Assessment model which was created using DeLone and McLean information system success model, was used to collect data from the government employees. At least 3 respondents were targeted per ministry or institution in Lusaka. The survey was conducted online using a google platform. An on-line questionnaire was sent to 120 e-mails, only

90 copies were retrieved, giving a response rate of 75%. According [16], a sample is regarded as large sample if the sample size $n \geq 30$. The data was found fit for data analysis. Google platform processed the answers in an excel sheet which was further analysed in SPSS frequency, descriptive and factor analysis statistics.

Data Analysis, Results and Discussion

Performance of the e-Government system in terms of system quality and information quality

The performance of e-Government systems was measured, the results from the questionnaire survey indicated that the performance of e-Government systems quality was rated as 'good' at 55.6%, seconded by 'fair' at 34.4%. The findings of this study confirmed that System Quality (SQ) was the most valued among the quality dimensions. Figure 3 shows performance of e-Government systems in terms of system quality. The research discovered that if a system is user friendly, employees have the desire to use the system.

The study found that the variables used in SQ questionnaire were valid and is agreeable with the same variables for their study, however, this study dropped the variable 'ease of use' because the variable is synonymous to 'user friendliness'. Cronbach's alpha tests was used to check whether multiple-question Likert scale surveys were reliable, and the study observed that the designed tests were accurately measuring the variable of interest [5].

Idoughi and Abdelhakim state that higher degrees of SQ are positively associated to higher levels of expressed satisfaction. It also confirms that there is a strong positive effect between SQ and user satisfaction (US). In this study it was proved that Integrated Financial Management Information System (IFMIS) and Government e-Mail system that is MS Outlook were found to be significantly related to US. The results prove that when a government employee finds a systems user friendly, they will have a desire to use them and the outcome will be user satisfaction which has many benefits attached to it [3,5,6,10].

The performance of the e-Government systems would even increase further if end users utilize Skype for Business and Share Point. From the study, it was seen that the utilization levels of skype for business and Share Point were low. This could be due to non-sensitization on these two systems. As the Government of Zambia is putting huge investments in the procurement of e-Government systems to make the e-Government programme in Zambia reach its goals, there is need for the e-Government coordinating division to ensure that systems are adopted and utilized.

Regarding e-Government systems information quality (IQ), most of the respondents agreed at 51.1% that the e-Government systems produce accurate, sufficient and reliable information as shown in Figure 4.

DeLone and McLean state that users perceive Information Quality (IQ) of e-Government systems as the quality of contents delivered by these e-services. The success dimension IQ constitutes the desirable



Figure 4. Performance of e-Gov Systems in terms of information Quality.

characteristics of an IS's output. For this study, the information quality was based on IFMIS. Thus, the study incorporated measures focusing on the quality of the information that IFMIS produced and its usefulness for the user [3,12].

The investigation uncovered the significance of IQ on US of IFMIS, measured in terms of precise, sufficient, reliable, accuracy, and accurate information. These elements stimulate the view of government employees and create a criterion for assessing system efficiency. The study also investigated how Microsoft Outlook, IFMIS, Skype for Business and Share Point fit organization needs and it was found that IFMIS and Microsoft Outlook are services that were tailor made for government employees. The association between IQ and US is firmly supported in the literature. Studies have found a coherent association between IQ and US. Nwone, specifically observed the significance of IQ on US of the PG school web portal. However, researchers did not find a significant relationship between measures of IQ and US. Stefanovic examined the information quality aspects of e-Government systems and found that IQ does not directly affect US. However, searching for information is the most widely recognized reason for using e-Government services [4-6,14].

It was observed in the study that IQ dimension indicated a highest standard deviation which could mean that there was more variability in the observed data. This is because the investigations on IQ was mostly based on IFMIS and few respondents in the study used IFMIS. In terms of internal consistency, the study found that IQ dimension had excellent and most reliable variables of interest. The study further found that the associations between the variables were highly supported from initial correlation analysis. Therefore, IQ impact US significantly and has a significant influence on intention to use/use. The study has also found that the value of information that IFMIS provides is accurate, sufficient and reliable.

Service quality from information systems providers and readiness of personnel in the use of e-government systems

Service Quality (SV) as 'the consequential outcome of a comparative analysis between the anticipated service and its real performance judged by the end users'[3]. The study found that e-Government system providers do not meet the government workers' needs in regards to individual attention, understanding specific needs, secure and protect privacy and availability of services. In general, 41.1% of the respondents were not satisfied with the e-Government service quality, however, 32.2% felt satisfied as shown in Figure 5. The number of those who were not sure was equally high averaging 26.7%. There is need to find further as to why this percentage of government staff was not too sure of e-Government services provided. On average, e-Government systems users were not satisfied with the services provided to them.

When the study applied a frequency distribution technique to give a view of the data which would allow the study to find patterns, it was observed that the respondents were satisfied with the service quality that IS providers offer. However, further analysis showed that e-Government systems users were not satisfied with the services provided to them. This could be because of the two sample applications used in this study namely; Skype for Business and Share Point which were underutilized. If end users have more prominent desire from an installed system compared to what is delivered, the system would be seen as not to have met the expectations, this confirms the definition by [3] and is agreeable with who emphasized that service quality has significant influence on users' satisfaction. The study found that Skype for Business and Share Point were the two systems that were not delivered to user's expectations. Cohen reviewed that e-Government success depends highly on SV and how user focused they could be [12,13].

Behaviour and attitude of users' dependency on the e-Government systems

The results show that the government employees' dependency on

e-Government systems were rated as moderate at 65.6% and high at 28.9% as shown in Figure 6. On the overall, the 'intention to use/use' of the e-Government systems by government employees was moderate. There is need to further improve the utilization of these systems in order to maximize the productivity of government services. The majority of the government employees did not have the capacity to utilize Skype for Business and Share Point and these systems were rarely used at 44% and 69% respectively as shown in Figure 7.

The investigation uncovered the significance of 'intention to use' on user satisfaction of the e-Government systems, measured in terms of frequency of use and dependency on the system. The measurement intention to use signified the way in which e-Government systems are utilized by government employees, the study agreed with [7] who state that measuring the usage of IS could be a broad concept that could be considered from several perceptions.



Figure 5. Service Quality.

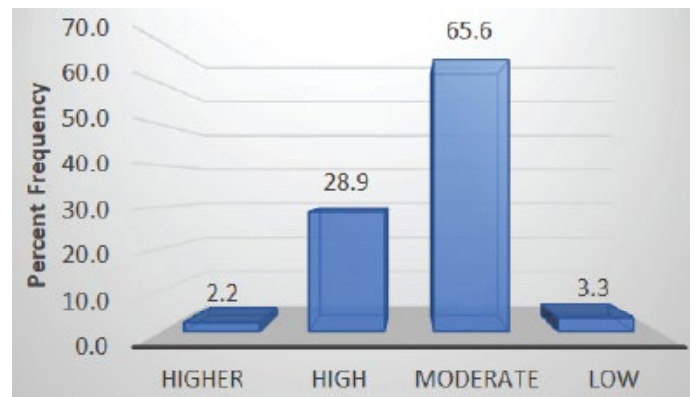


Figure 6. Utilization of e-Government Systems.

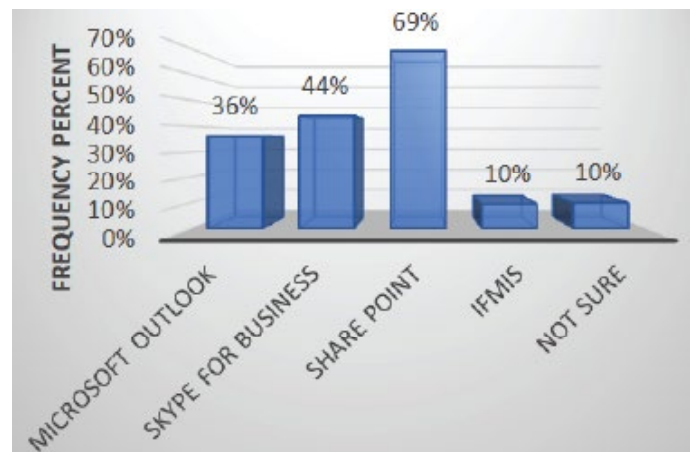


Figure 7. Rarely used e-Government Systems.

The study found that the variables used in the questionnaire for intention to use/use dimension to be valid and is agreeable with who used the same variables for their study. Cronbach's alpha tests was used to check whether multiple-question Likert scale surveys were reliable, and the study observed that the designed tests were accurately measuring the variable of interest. However, when further tests were conducted using PCA analysis, the results were different from the factor analysis compute variables. According to Kumar, reliability refers to a degree to which an instrument produces the same results over several trials. Validity refers to the extent that the instrument measures what it was designed to measure. The tests obtained in this section implies there was little reliability with the instruments used in this dimension. Further studies need to be conducted to find out why there was this difference in the tests conducted [5,16].

The study also found that the correlation coefficient amongst the variables in intention to use/use dimension was poor, of which other literature would regard it as moderate. There were lots of correlations close to 0 which indicated that there was little linear relationship between the variables. On the overall, the results showed that the p-value for the correlation level was significant. Therefore, intention to use/use had an impact on US significantly.

The findings of this study confirmed that intention to use/use with the second highest mean was a valued dimension, intention to use/use standard deviation was the lowest among all the dimensions which meant that its data was the most reliable.

This study further found that government employees' intentions to use of e-Government systems increases if employees notice the e-Government systems to possess some degree of quality in systems provided. The dimension intention to use had an effect with US and is agreeable which states that when the intention to use/use of an e-Government system is higher, user satisfaction (US) will increase thus direct effect. Users utilized the desired services such as IFMIS and Microsoft Office. The information provided by the e-Government systems was illustrated based on users' needs, letting users to promptly obtain the information or services sought. Users located and completed transactions with ease, thus increasing their intention to utilize and adopt e-Government systems.

Government employees' general satisfaction with the e-Government applications

The results on general satisfaction of the government employees with the e-Government applications show that Microsoft Outlook was the most appreciated service which was rated on average at 34%, seconded by IFMIS at 31%. Skype for Business was rated at 15% whilst Share Point was at 13% as shown in Figure 8.

According to prominent researchers, US is a significant measure of information system success. US is the attitude of users to the computer system they employ in the context of their work environments. It is the opinion of the user about a specific computer application, which they use. The success dimension US signifies the degree to which IS are contributing to the success of the different stakeholders [12].

A study showed that during the life of a system, satisfaction from users will on average increase in time as the users' experiences with the system increase. They thus define US as the deficiency of user displeasure and grievance, as assessed by users who have had at least some experience of using the system. Alternatively, satisfaction is focussed on experience in use of a system. Motivation, equally, is based on opinions about the future use of the system [15].

The investigation in this study uncovered the importance of US in relation with the three quality dimensions, Intention to Use/Use and change management (CM). US was measured in terms of satisfaction with the e-Government systems, quality, and fulfilled expectations. The study investigated the satisfaction of government employees on the utilisation of e-Government systems by observing the ratings of the applications and services such as IFMIS, Microsoft Outlook, Share Point and Skype

for Business. The study concluded that the users were more satisfied with Microsoft Outlook and IFMIS. The study further examined the users' perception on the quality of e-Government systems provided, it was found that Microsoft Outlook and IFMIS were regarded as systems of high quality. The study also examined whether the e-Government systems met their expectations, according to the results obtained, the majority responded positively. The study found that government employees who use IFMIS were more experienced with information in the system and satisfied with certain services provided by IS staff.

The overall results showed that government employees were more satisfied with Microsoft Outlook and IFMIS. The study agreed that intention to use/use had a positive and direct effect on user satisfaction. However, this study discovered the dissatisfaction of government employees on Share Point and Skype for Business. The investigations of the study propose that, in order to increase user' satisfaction in regard to the e-Government systems, it is critical for the e-Government coordinating institution to develop or provide the systems that deliver highly specialized quality, usable, user-friendly, and warrant that services are desired for government employees [5].

Users of the systems, in this context government employees' satisfaction towards e-Government applications, could intensify their user satisfaction and make them to be more effective. The more government employees are satisfied with e-Government systems, the more they would have the desire to use them. It states that frequent use of the products offered by an organisation indicate user satisfaction. Customers, in this context, government employees could be disgruntled when their expectations are not met or the commitments from IS providers are not fulfilled reasonably and within the given time span. This becomes a serious issue for the customers as the delay will obviously affect their image as well [18].

Change management: Further results in the study indicated that 64.4% of the respondents agreed that they were aware of e-Government systems and that they received their training on the e-Government systems as shown in Figure 9. However, 15.6% were not aware of the e-Government systems and were not trained whilst 18.9% were not sure. This implies that government employees had some degree of awareness and received formal training on the utilization of specific systems and services.



Figure 8. User Satisfaction.



Figure 9. Awareness and Training on e-Government systems.

Table 1. Summary on Questionnaire Data Analysis.

System Quality		Information Quality	Service Quality	Intention to Use/Use	Change Management
Cronbach's alpha test	0.822	0.985	703	682	0.677
Validity Test	0.699	0.959	0.231	0.438	0.626
Average Mean & Std Deviation	Mean 3.53 Std Dev. 737	Mean 2.31 Std Dev 1.563	Mean 1.94 Std Dev. 770	Mean 2.70 Std Dev .570	Mean 1.57 Std Dev .835
Correlation	Moderate Significant .000	Excellent Significant @ .000	Unacceptable Insignificant @ .028	Poor Significant @ .000	Moderate Significant @ .000
The KMO and Bartlett's test	0.541 Significant .000		.655 Significant @ .000	.500 Significant @ .000	.713 Significant @ .000
Principal Component Analysis	Component 1: 0.868 Component 2: 0.937 Component 3: 0.875 Supported			Component 1: 0.795 Component 2: 0.915 Component 3: 0.904 Not Supported	

Findings in this study suggest that government employees were trained in Microsoft Outlook and IFMIS. Most of the respondents mentioned that they never received training in Skype for Business and Share Point. Some respondents did not know as to whether the e-Government services were making their job easier or not. The reasons that came out as the cause for such attitude were lack of training and lack of change management on certain applications. Other respondents did not find the e-Government services useful in their jobs because they did not know how to use them, whilst others said the services were not available in their institutions and that they were not secure nor reliable. This caused the government employee to resist using applications which they were not familiar with. Training on the newly acquired systems is vital. Training should not only be conducted once but it is an on-going venture until participants fully grasp the concept. The findings on CM dimensions is agreeable who stated that "to avoid drawbacks in the deployment of e-Government services, the CM must be treated in a more systematic way. CM is a continual improvement process. To improve the usability of e-Government services with respect to the needs of users" [9].

CM ensures that government employees adapt to the changes brought by the introduction of e-Government. CM is a new construct introduced in this study to assess the behaviors and attitudes of users' dependency on e-Government systems. The importance of CM is to; minimize on the resistance that may occur in the change process, enhance on the performance of the end users, enhance innovation amongst the end users, inform stakeholders/users on the benefits of the change being implemented, create awareness, desire to change, acquire knowledge, ability to change and reinforce change, value realization and end-users to use the system.

"Change Management (CM) is the discipline that guides how to prepare, equip and support individuals to successfully adopt change in order to drive organizational success and outcomes." The study found that the variables used in CM questionnaire were valid. There is no literature, however, which has conducted a research to measure CM using IS Success models [17].

Summary on questionnaire data analysis: Table 1 summarizes a survey questionnaire data analysis. The findings of this study confirmed that SQ with the highest mean of 3.53 was the most valued dimension seconded by Intention to Use/Use with a mean of 2.70, third was IQ with a mean of 2.31. Service Quality took the fourth position with a mean of 1.94 whilst CM was last with a mean of 1.57. IQ indicated a highest standard deviation, this could mean the dimension had more variability in the observed data. This is because IQ was based mostly on IFMIS and few respondents in the study used IFMIS. The lowest standard deviation was on Intention to Use/Use, this shows that the **data** were clustered closely around the **mean**, an indication that the data was more reliable.

Cronbach's alpha was used to measure internal consistency. It tested whether multiple question Likert scale surveys were reliable. The study found that IQ dimension had excellent and most reliable variables of interest seconded by SQ which had good internal consistency. Service Quality came third whose trustworthiness of its variables was acceptable. Reliability of the variables for Intention to Use/Use and CM were moderate. The variables for all the dimensions correlated well except for Service Quality whose variables were unacceptable.

The study did not subject, IQ, service quality and CM dimensions to principal component analysis tests because they had few variables. Principal component analysis aims at reducing the number of variables in order to explain and interpret results from the survey.

Conclusion

The objective of this paper was to show the utilisation of e-Government systems by government employees in Zambia. The methodology for assessing the usage of e-Government systems was done through a modified e-Government Systems Assessment Model. The modified model gave important insight into how well the government employees were utilizing the e-Government systems.

The information systems characteristics that were used to assess the usage of e-Government systems were SQ, IQ, SV, intention to use/use and CM. The findings of this study confirmed that SQ was the most valued among the quality dimensions. SQ and IQ had a huge impact on User Satisfaction. The study found that SV did not meet User Satisfaction. The study discovered that Intention to Use/Use of the e-Government systems by government employees was moderate. On the overall, the respondents were satisfied with e-Government systems, however, the percentage number of those who were not sure about the e-Government systems was high. There's need to further find out why the percentage of government staff was not sure of e-Government systems. There's also need to re-enforce the quality of service that users of e-Government systems receive from e-Government Coordinating Division.

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