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The Influence of Perceived Usefulness of GePG on Revenue Collection in Tanzania: The Case of Dodoma City

Dr. Gwahula Raphael
Lecturer, Department of Accounting and Finance, The Open University of Tanzania, Tanzania

Abstract:
The focus of the study was to assess the factors influencing the Perceived Usefulness of Government e-payment Gateway (GePG) on Revenue Collection in Tanzania. The study adopted a quantitative approach whereby questionnaires were used to collect data from Dodoma Urban Water supply and sanitation vendors in Dodoma city. Stratified sampling technique was used to ensure sample representation among vendors from different streets, thereafter simple random sampling was used to collect data from the sample size of 178 respondents. After using multiple regressions, the findings revealed that perceived benefits and perceived ease of use of GePG are among factors influencing usage of such technology in Revenue Collection from utility services delivered. This study recommended that awareness to users of GePG should be instituted to increase usage rate of GePG. Furthermore, cost of executing transaction should be reviewed and not to become the burden for one who is paying the water services. Also, the e-Government and other government entity which are entrusted for smooth running of the system should make sure that the system is stable to enhance reliability.

Keywords: *Perceived usefulness, GePG, revenue collection*

1. Introduction

Government electronic payment gateway (GePG) is the newly introduced payment system in order to improve the revenue collection management in Tanzania which allow individual to make payment (settling bills, land rent and other payment) to government by means of electronic through mobile phones and other electronic devices. The introduction of GePG rose from several challenges in collection of revenues which included high costs associated with revenue collection, limited accessibility of electronic payment services, management of collected revenue, reconciliation of transactions and records keeping (invoices/payments/banking), and the quality of reports generated by the systems. The system intends to standardize revenue collection practices within the Government and its institutions as well as increase visibility of the transactions at all stages of the collection process.

Electronic payment has received much attention in now-days business and non-business communication which includes Government to Person (G2P), Person to Government (P2G) and Government to Government (G2P). The GePG implementation has taken advantage of technological advancement Information and Communication Technology (ICT) and high coverage of mobile telecommunication services in Tanzania which together with other factors have transformed operations in the financial sector. The GePG system operations are based in the statutory requirements under the Public Finance Act 2001 as amended by the Finance Act 2017, which specifically provides that all public money shall be collected electronically through the GePG. The introduction of ICT Policy of 2016 has paved the way to the usage of electronic payment in Tanzania which includes well developed infrastructure after the construction of fiber (URT, 2016). Other government initiatives already introduced are the establishment of the Tanzania Communication Regulatory Authority (TCRA) to regulate inter alia money transfer technology and system (URT,2003b) and inauguration of e-government Agencies to streamline the operationalization of ICT in Tanzania. These initiatives have created a sound environment to support non-tax revenue collection with less cost and in promoting the usage of the latest technologies to promote government operations.

Since mobile money services have become popular in Tanzania and the payment service providers are mainly using electronic transactions, it was evident that having an integrated Government electronic payment solution that links with Payment Service Providers and Service Providers. The government of Tanzania has made an emphases for the its entities to register in the electronic gateways by perceiving the it will minimize the loss of Government revenue therefore, supports efficient functioning of government organs through improved management procedures and upgrades the quality of government operations (Januszewska , et al., 2015). In the same vein, scholars (Yang, et al., 2013; Jain, et al., 2013) have advocate for the improved management and internalization of ICT has influenced its usage.

Despite the less operational cost and impact on revenue collection, some of government entities have not yet registered to newly launched system while still using the oldest style. This has lead even the vendors from government

services have slow pace in using GePG. It is imperative to find the ICT mode which will facilitate revenue collection into improvement of the public services delivery (Githinji, Mwaniki, Kirwa, & Mutongwa, 2014). It can be recalled that, factors like perceived benefits and perceived ease of use will influence the GePG usage (OECD, 2000).With these results from reviewed studies, it is not clear which factor could specifically or strongly explain why Government of Tanzania and its entities have embrace electronic payments in non-tax revenue collection.

This study therefore, aims to fill the gap by identifying and analyzing factors that influence decision to use GePG among government entities in the non-tax revenue collection in Tanzania. An understanding of the factors can assist in speeding up the usage of GePG and so promote the government operations particularly increase non-tax revenue collection and hence increase the government capacity to serve its citizen.

2. Literature Review

2.1. Theoretical Literature Review

Government electronic payment gateway (GePG) is one of the recent new technologies emerging which has been designed with the purpose of fastening revenue (Tax and no-tax) collection in Tanzania. Different countries have already used this technology while other countries are in process of adopting. GePG being a new but a fast growing technology, this study, therefore examined theories which are purposely predicting variables which influence technology usage. Similarly, in this study a researcher was informed on perceives usefulness as being linked with relative advantage (Benefits), perceived ease of use and other influencing factors in Information Communication Technology (ICT) usage. These linkages enable the explanatory power of the findings on factors influencing adoption of mobile money services among SMEs

2.1.1. Technology Acceptance Model

In the literature on the usage of information systems, scholars have employed various theories to study the usage of different ICT products. However, most of these theories which include the Theory of planned behavior(TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), have focused on the adoption by individuals rather than by government institution(Maditinos, Chatzoudes, & Sarigiannidis, 2013; Venkatesh, Morris, Davis, & Davis, 2003). Technology acceptance model (TAM) is widely adopted theory for examining the using of a technology by users(Davis, 1989). TAM was first introduced by Davis, (1989) posit that perceived usefulness (PU) and perceived ease of use (PEOU) as major determinants for using a technology. This implies that, the perceived usefulness of GePG is primarily predicting the belief of a person that the technology helps to collect revenue faster, more easily, and more effectively in completing financial task(Ohme, 2014)

2.1.2. Diffusion of Innovation Theory (IDT)

Rogers (2003) developed a theory known as diffusion of innovation which to explains changes in technological acceptance over time as individuals gain experience. He argues that, diffusion is a process by which an innovation is communicated through defined channels over a period of time among the members of a social system. The application of the diffusion of innovation theory in the SMEs has been observed in a number of empirical studies. For example, Tan and Eze (2008) adopted diffusion of Innovation theory in a study of internet, the findings revealed that relative advantage, compatibility, complexity, observability and security are significant factors influencing Internet-based ICT adoption in SMEs in Malaysia. Therefore diffusion of innovation is determined by five attributes which includes relative advantage, compatibility, complexity, trial ability, and observability. This study points benefits of using GePG in revenue collection as the new innovation which supersedes the previous revenue collecting tools in Tanzania.

2.2. Empirical Literature Review

Madila and Msamba (2016) conducted a study on the effectiveness of mobile money application in the development of SMEs, the main objective being to determine the effectiveness of mobile money in supporting the growth of the micro and small Enterprises in Tanzania, the case Moshi Urban, Kilimanjaro Region. The study concluded that the cost of using mobile money should be reduced to attract more SME's to use MMS and to be afforded by the majority of residents whose standard of living was low. In this context therefore, usage of GePG in Revenue collection are seems to benefit the water authority but the question left is on the cost influence on executing financial transaction. Mramba, et al. (2014) conducted a survey of mobile phone usage patterns among street vendors in Dar es salaam city and established that, among the street vendors, mobile phones are commonly used for social communication and very minimally to engage in and promote business transactions. Mawona and Mpogole (2013) in their study of mobile phone banking usage in Tanzania revealed that, accessibility and convenience were important factors that influence technological usage. As time passes, electronic payment (e-payment) continue to show much progress, attracting many government business and individuals to make transactions either online or though other media such as mobile phone communications, depending on the technology available and existing national business laws and policies (Claessens et al., 2000a).

Kimani, et al. (2016) studied on a multivariate analysis of the effect of mobile phone money transfer (MMT) on SMEs growth and expansion in Thika town, Kenya. The study highlighted that SMEs were increasingly adopting the use of MMT to increase the quality of their services and promote growth and this helped the business entities concerned to achieve their goal. This means that, e-payment has great potential to improve the quality and scope of financial services y offering more cost-effective delivery of services. Venkatakrishnan and Senso (2013) conducted a study on Challenges of mobile-phone money transfer services' market penetration and expansion in Singida District, Tanzania. Reduction of

transaction charges, ensuring widespread availability of agents in rural areas, stability of network, regular supply of electricity, training and information to users were suggested as the necessary measures required to increase the usage, penetration and expansion of mobile money service usage. This study has been designed to bridge the gape on e-payment usage to support Government revenue collection which will enhance the government to render the required service to its citizen.

Given this empirical evidence, this study posits two hypotheses as follows:

- H_1: Perceived benefits on GePG positively and significantly influence revenue collection
- H_2: Perceived Ease of Use on GePG has positively and significantly influences revenue collection

2.3. Conceptual Framework

The conceptual framework consist two independent variable namely perceived benefits and perceived ease of use of GePG and no-tax revenue collection as dependent variable as discussed in the literature review.

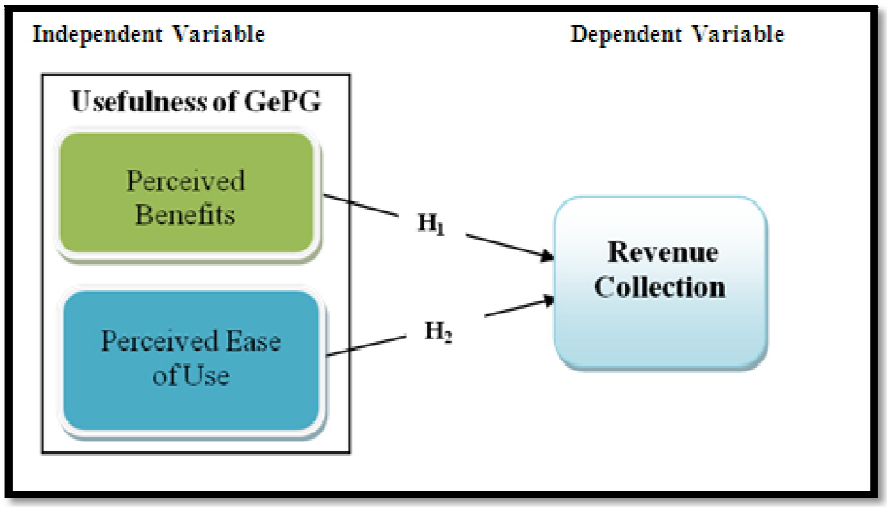

Figure 1: Conceptual Framework (Study Determinants)
Source: Developed by Authors from Literature Review (2018)

3. Methodology

The study has employed quantitative research technique. Quantitative research is viewed as a research strategy that is build and make an emphases on quantification of data while qualitative approach pinpoint and emphasis on the words rather than quantification of the data collection and analysis (Bryman, 2008). Quantitative approach entails a deductive approach to the relationship between theory (ies) in which the accent is placed on finding the cause and effect of such constructs build from theories and norms of the natural science model of positivism(Saunders, et al., 2012). The study was conducted in Dodoma city to a targeted population of vendors of Dodoma Water and Sanitation Authority (DUWASA). Managerial stratified sampling technique was used to ensure representation of the sample among vendors of DUWASA and thereafter simple random sampling was used to draw from each stratum from a sample size of 162 respondents. Questionnaire was used to collect primary data to understand the perceived usefulness of GePG on water bills collection.

To test sample adequacy for exploratory factor analysis, the Kaier-Meyer-Olkin (KMO) was used to test sample adequacy. For the KMO statistic Kaiser (1974) recommends a bare minimum of .5 and that values between .5 and .7are mediocre, values between.7and.8 are good, values between.8 and.9 are great and values above.9 are superb.

The overall value for KMO is .872, which falls into the range of being good as indicated in table 1 below. Conversely, the bartlett's test results as indicated in table 1 helped to measure the null hypothesis that the original correlation matrix is an identity matrix. A significant test tells that the matrix is not an identity matrix which provides evidence that, there are some relationships between the variables we hope to include in the analysis. For such data, Bartlett's test is highly significant ($p<.001$) which justify some relationships between the variables exist in correlation matrix which support to include the items found in the correlation matrix for the exploratory analysis. Hooper (2008) argues that bartlett's Test of Sphericity reached statistical significance indicating the correlations were sufficiently large for exploratory factor analysis.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	8179.306
	df	1225
	Sig.	.000

Table 1: KMO and Bartlett's Test

In this study, hypothesis testing and examination of the significant effect of predictor variable was done using structural equation modeling (SEM). The suitability of SEM in this study was pointed by Hooper, et al. (2008) who asserts that, SEM has ability of incorporating observed (measured) and unobserved variables (latent constructs) while traditional techniques analyze only measured variables. SEM allows making use of several indicator variables per construct allows a set of relationships between one or more independent variables and one or more dependent variables for completeness simultaneously, which leads to more valid conclusions on tests of all the relationships between constructs (Byrne, 2010).

4. Presentation of the Finding

4.1. Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) was used in order to ensure that constructs were aligned with their indicator variables. Babyak and Green (2010) pointed out that, a poor fit model will occur in a situation where there is incongruence between the researcher, theory and data. In this study, the researcher built the conceptual framework by integrating construct and indicator variables from different theories, empirical evidences and technical views on the factors influencing Perceived Usefulness of GePG on Revenue Collection in Tanzania.

The diagnostic tools were used to evaluate whether the collected data are in line with theoretical expected pattern and assess a structure of the targeted construct. The use of combination of more than one factor extraction shows that, all three constructs in the model yields engine value for correlation matrix greater than 1 in the model and met the Kaiser's criterion which leads to retain only factors with confidence interval greater than one (Kaiser, 1960) as per Table 2

Items	Perceived Benefits	Ease of Use	Revenue Collection
PB2	.910		
PB5	.910		
PB6	.792		
PB3	.780		
PB1	.679		
PE6		.918	
PE1		.908	
PE3		.636	
REV2			.950
REV3			.950
REV1			.447
Eigenvalues (% of Variance)	45.1	15.5	13.0
Eigenvalues (Cumulative%)	45.1	60.6	73.6

Table 2: Rotated Component Matrix[a]
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation Converged In 5 Iterations.

4.2. Confirmatory Factor Analysis

At the beginning, the researcher developed a conceptual framework, at this stage he wanted to confirm and harmonize a belief about how the original variables are organized in a required way using Confirmatory Factor Analysis (CFA). CFA was used to analyze theoretical constructs through assessing the loading of the measures, error variances and covariance (Hooper, et al., 2008).

4.2.1. Measurement Model

In order to reach a measurement model that fits both components, CFA was run with maximum likelihood estimate in IBM Amos 22 to determine its fitness. After initial run, the results showed a bad model fit with CMIN/DF= 6.534, GFI=0.814, AGFI=0.785, CFI=0.894 and RMSEA=0.209. Based on Hoe (2008) recommendation which requires a model to achieve the following minimum requirements CFI (>0.90 indicates good fit), RMSEA (<0.08 indicates acceptable fit), and commonly used $\chi 2$ statistic ($\chi 2$/df ratio of 3 or less) to be considered fit. To improve the model, some items were removed as recommended by Hooper, et al. (2008). After removing those items in the model, re-running the model indicated adequate fit results with $\chi 2$= 2.11, GFI=0.977, AGFI=0.919, CFI=0.985 and RMSEA=0.079.

On the other hand, the observed variables with significant probabilities have positive standardized regression weights greater than 0.40 and standardized path coefficients between measured variables and factors in the models show that all

path coefficients between measured (manifest) variables and latent (un-observed)variables in the model are significant(p <0.05).These results indicate that most of the factor loadings explaining the measurement model are adequate and thus reflects a very good reliability of the research constructs. In this case, the researcher has achieved the above good results; hence a robust measurement model was achieved as illustrated in Figure 3 below. The retained items were used in the final analysis of the structural model.

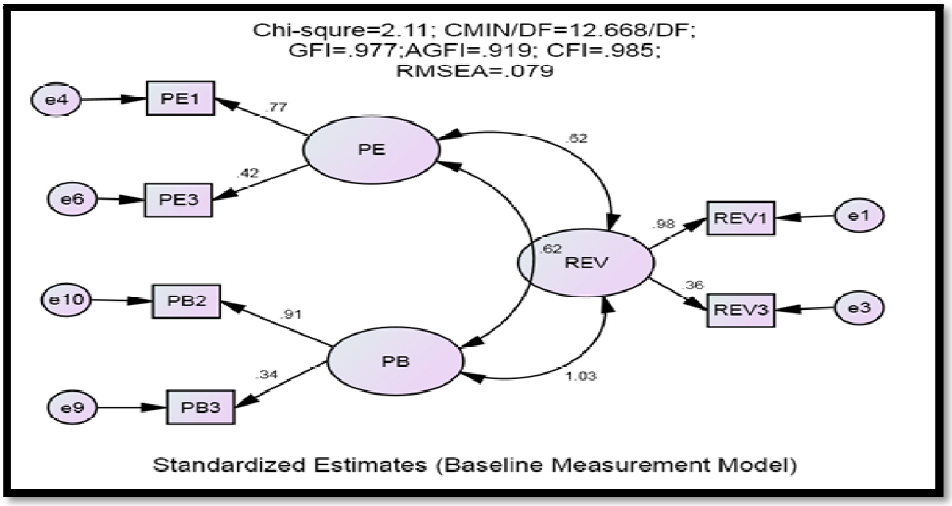

Figure 2: Measurement Model
Key Note: Perceived Benefits, BP2: Speed up Transaction, PB3: Convenience
PE Perceived Ease of Use; PE1, Ease to Learn, PE3, Fitness of Use
REV; Revenue Collection, REV1, Prompt Transaction; REV3; Financial Control

The retained item in the baseline model were used in analysis of structural equation mode

4.2.2. Structural Model

The Structural Model of the study which hypothesized the relationship between the influence of Perceived Benefits and Ease of Use on GePG on Revenue collection was analyzed. The results of the analysis using AMOS version 22 are diagrammed Figure 3 below and the results for the goodness of fit indices based on four indices namely CMIN/DF,CFI,AGFI and RMSEA are presented

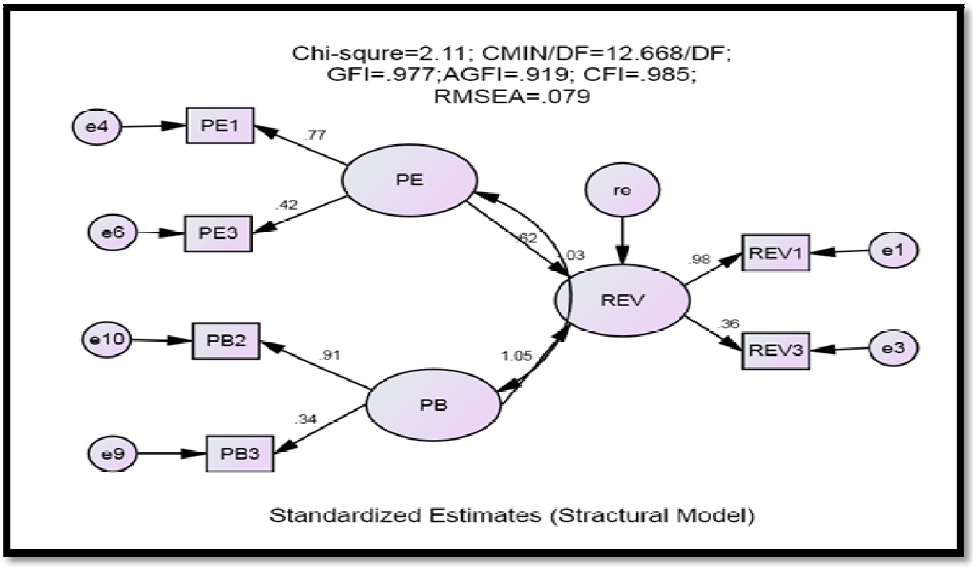

Figure 3: Structural Model
Key Note: PB; Perceived Benefits: BP2: Speed Up Transaction, PB3 Convenience
PE: Perceived Ease of Use Pe1, Ease to Learn Pe3, Fitness of Use Rev; Revenue Collection,
REV1, Prompt Transaction; REV3; Financial Control

The finding in the model from analyzed data shows that, the ratio of chi- Square to the degree of freedom CMIN/DF which is commonly referred as the normal Chi- square value, was 2.11 which falls in the range of is less than 3 as suggest to the

fit model (Schemelleh-Engel et al., 2003). The fit indices yield the following results: GFI = 0.977, AGFI = 0.919, CFI = 0.985 obtained in the model falls in the accepted range of fitness of the model and hence indicate and excellent fitness of the model.

Hoe (2008) suggested that a RMSEA value of 0.00 indicates perfect fit, the value ranging from 0.05 to 0.08 indicates acceptable fit, and 0.08 to 0.1 indicates ordinary fit while greater that 0.1 indicates poor fit. In this study, the RMSEA yield 0.079 which also fall on the accepted estimates to indicate a good fit of the model. Having established a model fit which indicates a good fit using four indices, the path coefficient and hypothesis testing were evaluated as explained in the next section using this model.

4.3. Path Coefficient and Hypothesis Testing

The structural model was used to test the hypothesized relationships. The hypothesized relationships are examined against various coefficients and scores obtained from the analysis. A standardized paths coefficient, critical value (C.R) and significant level (p) were used in this study in the testing and evaluation of strength and the level of significance of the hypotheses.

- H_1: Perceived benefits on GePG positively and significantly influence revenue collection

To test this hypothesis, structural equation modeling was used and the results are indicated in Table 3 below:

Path			Estimate	S.E.	C.R.	P	Label	Standardized Regression Weights	Results
REV	<---	PE	0.364	0.073	4.971	***	par_1	0.362	Accepted
PE1	<---	PE	1.000					0.763	Accepted
PE3	<---	PE	0.524	0.15	3.500	***	par_2	0.422	Accepted

Table 3: Structural Model Regression Weights and Standardized Regression Weights on Perceived Ease of Use and Revenue Collection

The path leading from PE to REV in table 3is used to examine the relationship between Perceived ease of Use of GePG and Revenue collection. A positive path coefficient ($\gamma = .362$) using standardized estimate, critical values (C.R = 4.971 which is >1.96) and a significance level of p=0.000in Table 3 above indicates that Perceived ease of use on GePG usage is positively and significantly related to Revenue collection. This concurs with Chin (1998) and Hoe (2008) who argued that standardized path coefficient (γ) should be at least 0.2, critical ration greater than 1.96 and a p-value less than 0.05 to be considered significant.

Path			Estimate	S.E.	C.R.	P	Label	Standardized Regression Weights	Results
REV	<---	PB	1.280	0.355	3.608	***	par_3	0.335	Accepted
PB3	<---	PB	1.000					0.350	Accepted
PB2	<---	PB	2.595	0.534	4.859	***	par_4	0.932	Accepted

Table 4: Structural Model Regression Weights and Standardized Regression Weights on Perceived Benefits and Revenue Collection

The path leading from PB to REV in table 3 is used to examine the relationship between Perceived ease of Use of GePG and Revenue collection. A positive path coefficient ($\gamma = .335$) using standardized estimate, critical values (C.R = 3.608 which is >1.96) and a significance level of p=0.000in Table 4 above indicates that Perceived Benefits on GePG usage is positively and significantly related to Revenue collection. This concurs with Chin (1998) and Hoe (2008) who argued that standardized path coefficient (γ) should be at least 0.2, critical ration greater than 1.96 and a p-value less than 0.05 to be considered significant.

5. Discussion and Conclusion

This paper mainly focuses on the perceived influence of technological usage to support Revenue collection in Tanzania. Considering that Perceived influence on GePG are crucial for the effective and efficiency on Revenue collection (both tax and non-tax) for government to render service to its citizen. In examining the influence of perceived usefulness on GePG usage, the researcher investigated how and whether the perceived ease of use of GePG has significance influence to support Revenue collection. According to Davis (1989), perceived ease of use is the degree to which a person anticipated that the use of a certain technology will be free of effort and will be determined by the attitude to adopt and use new technology.

The attitude toward usage will determine the person's future decision concerning usage of new technology by considering that an application that found easier to use will be most likely to the accepted by users. On other hand, Perceived benefits accruing from GePG usage has played an important in the Revenue collection. The study has found that, GePG usage has improved prompt transaction on revenue collected and enhanced financial control of the resources collected. This means that, all revenue collected from the GePG usage can be accounted for in every transaction executed at a point of time. It has been observed some obstacles from GePG usage which includes awareness of the users and cost implication to execute transaction from the water vendor in settling his water bills.

6. Recommendations and Implication

The study recommended that the government must increase awareness on using GePG to execute transaction. In a new technology innovation, the awareness becomes which need to be technological out and bring the harmony in technological usage. It has been discussed that perceived benefits and perceived ease of use become corner stone influencing GePG usage to support revenue collection in Tanzania. These call for policies to be instituted which will create conducive operating environment, encouraging vendors of DUWASA and embrace on an entrepreneurial culture that leads to greater understanding of opportunities offered by GePG and improve technological usage for Government business undertakings. It is recommended that, for E-Government and other entrusted Government organ to strengthen the ICT environment and support GePG usage for easier and prompt revenue collection. Furthermore due to the growing pervasiveness of mobile money services usage through mobile devices, it is encouraged for other researcher to undertake a similar research using different approach of studding other parameters which influence GePG usage in revenue collection

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