

An Empirical Study on the Use Intention of Electronic Cash Collection System in Nigerian Federal Hospitals

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Abstract

It is a well-known fact that the use of electronic systems around the globe has facilitated and enhanced the efficiency in organizations. In light of this, federal hospitals in Nigeria have started using electronic collection system for cash collection purposes. Electronic cash collection system (e-collection) is a computerized system designed to handle cash collections with a view to block revenue leakages that are widespread within the Nigerian public sector organizations. However, the continuous use of the system is being faced with great resistance by those employees that were purposely meant to use it. In view of that, the aim of this paper is to investigate factors that could influence employee's intention to use e-collection system in the performance of their duties. Technology Acceptance Model (TAM) was adapted with an extension of computer self-efficacy variable with a view to providing additional explanation to the model. Partial Least Square (PLS) was used to analyse 116 responses from e-collection users in investigating the relationship between three independent variables (perceived usefulness, perceived ease of use, computer self-efficacy) and the dependent variable (intention). The results of the analysis revealed that positive and significant relationships exist between the independent variables and the dependent variable except between perceived usefulness and intention. Recommendations were made to the hospital authorities to educate and enlighten the concern employees on the usefulness and benefits of the new system.

Keywords:

Intention
E-Government
E-Collection
Technology acceptance model.

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1. Introduction

Information technology has been playing a significant role in improving the services and routine operations of both private and public organizations in the world over. It is also a tool that enhances the process of strategic decision making in most organizations. As such, the continuous adoption of electronic systems by public institutions to facilitate organizational efficiency cannot be overemphasized. It is in line with this progress that governments in most countries subscribe to the use of electronic government (e-government) system to effectively deliver its services to its citizens (Lee, Hwang, & Choi, 2012). In Nigeria, some federal hospitals have adopted electronic cash collection (e-collection) system as an e-governance platform exclusively meant for cash collection purposes. It is a computerized system that allows all charges made for services rendered by the hospital are being paid (by the patients) directly to a designated bank account through the use of electronic payment systems. Therefore, cash receipts for services rendered in the hospital are ceased to be collected by revenue officers in totality. The new system is purposely aimed at enhancing the efficiency in cash collections to avoid revenue leakages and fund shortfalls within the public sector organizations (including hospitals) in Nigeria (Akande, 2015). Furthermore, e-collection system has the advantage of ensuring efficiency in revenue collection and providing the convenience to patients to make online payments. Thus, e-collection system is a tool that improves and controls revenue generation and cash

collections respectively through the use of computerized systems. In view of these advantages, several hospitals authorities in Nigeria started to implement and use the system.

However, despite the seeming benefits of e-collection system use, employees' attitude toward the system is not encouraging for their unwillingness to embrace this new technology in the workplace (Oyegoke, 2013). Notwithstanding, previous studies such as Diatmika, Irianto, and Baridwan (2016) and Ariff, Min, Zakuan, Ishak, and Ismail (2013) to mention among others, have identified several factors that influence individual intention to use a new system. Furthermore, the most widely information system (IS) model that is being used by researchers in technology acceptance studies is the Technology Acceptance Model (TAM) developed by Davis (1989). According to this model, the two important independent variables that could influence individual's behavioral intention to use a system or technology are perceived usefulness and perceived ease of use. Based on this, the current paper is aimed at investigating the employees' behavioral intention to use e-collection system in the performance of their job tasks in Nigerian federal hospitals. In addition, previous studies have established that computer self-efficacy is also a determinant that influences system use among individuals and as such, this paper proposes the conceptualization and incorporation of this variable into Technology Acceptance Model.

In view of the above, this research paper will immensely contribute to knowledge in both theory and practice. Theoretically, this study has specifically looked into the behavioral use intention of technology by individuals in mandatory system use environment as against most of the previous studies that gave much emphasis on voluntary use of technology. In practical term, accounting information system is believed to be useful in improving the performance of organization, especially in terms of information processing, report preparation and decision making (Hussein et al., 2011). Thus, this study will give an insight to the administrators on employees' behavioral intention toward continuous use of the e-collection system which is integral and a subset of the accounting information system of the hospitals under study.

2. The Research Framework

Previous researchers have developed varying models that investigate individual's intention towards the adoption and use of technology. These models include: Theory of Reason Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Diffusion of Innovation Theory (DIT), Technology Readiness Index (TRI) and Unified Theory of Technology Acceptance and Use of Technology (UTAUT) to mention among others. Among all, TAM has been found to be superlative in explaining individual behavior in technology use and adoption (Legris, Ingham, & Collette, 2003). This is apparent because of its popularity among IS researchers, empirical support and dominance in IS studies (Wang & Butler, 2007). The original TAM developed by Davis (1989) as depicted in Figure 1 was construed with a postulation that system use is strongly determined by user's belief on its Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

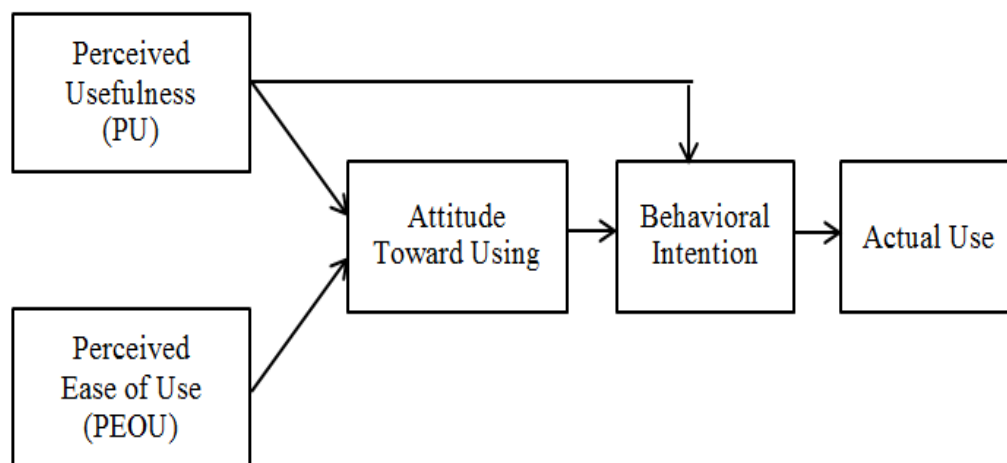


Figure-1. Technology Acceptance Model (TAM).

Source: TAM - Davis (1986).

Perceived usefulness is the degree to which a user of technology or information system believes that the system will enhance his or her performance on the job and perceived ease of use is defined as the degree to which an individual believes that using a particular system is free from effort (Davis, 1986). These two constructs were construed by the original TAM to investigate individual intention toward the use of new system. Nevertheless, TAM has been modified and extended by many researchers (Sharma & Yadav, 2011) in accordance with the purpose and context of a given study. In other words, some IS researchers have added other variables to the model to enable them test relationships that will further explain more so as to enable them arrive at valid conclusions within the context of their studies.

It is in view of the above that this study finds it important to extend the original TAM with a variable named 'Computer Self-efficacy' (CSE). It is worthy to know that computer self-efficacy construct has been used in IS researches to elucidate user perception on his/her ability to use computer in the performance and accomplishment of job tasks (Compeau & Higgins, 1995). In addition, CSE has been found in previous studies as a factor that influence information system's usage in individuals (Ariff et al., 2013; Cassidy & Eachus, 2002; John, 2013). In this regard, this study finds CSE as an appropriate factor to use in examining its influence on employees' intention towards the use of e-collection in Nigerian federal hospitals. The conceptual framework of this study is shown in Figure 2 below.

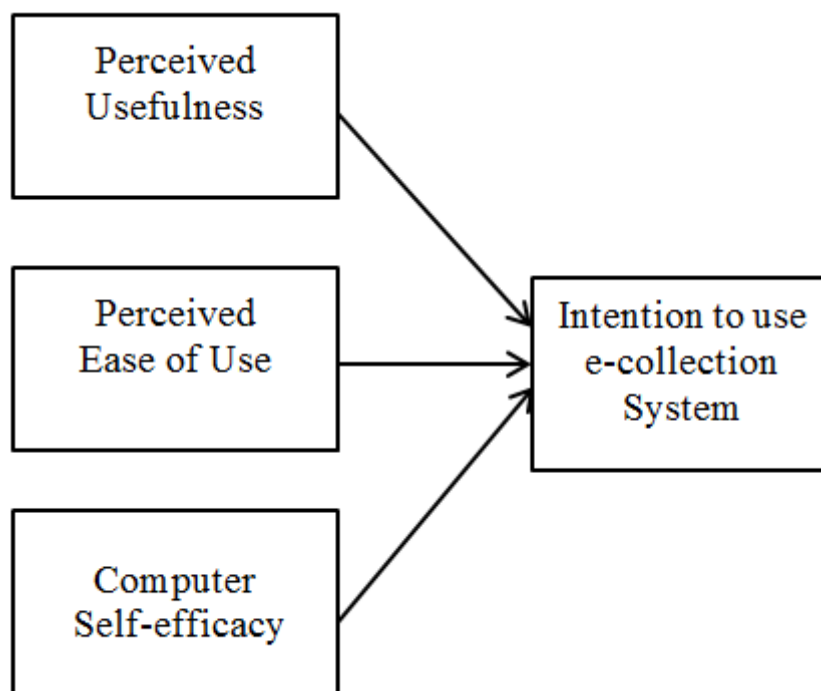


Figure-2. Conceptual framework of the study.

Source: Developed by the researcher.

2.1. Perceived Usefulness

According to Davis (1989) perceived usefulness is the degree to which a user of technology or information system believes that the system will enhance his or her performance on the job. Therefore, if a system user perceived the usefulness of e-collection system, there is a high possibility of patronizing it Sharma and Yadav (2011). In addition, prior studies have found direct effect of PU on behavioral intention in the use of online systems (Park, Nam, & Cha, 2012). Similarly, Tella and Olasina (2014) have found that PU has a significant influence on electronic payment system continuance usage in Nigeria. A similar finding of Oni and Ayo (2010) on its effects on electronic banking use among bank customers had also shown a positive result. Therefore, PU is an appropriate variable that could be examined to see its significant influence on intention to use e-collection system in Nigerian federal hospitals. In view of this, the study postulates the following hypothesis:

H₁: Perceived usefulness significantly influences the intention to use electronic collection system among employees of Nigerian federal hospitals.

2.2. Perceived Ease of Use

Perceived ease of use is the degree to which a user or potential user of a system believes that the use of a system to perform a task is free from effort (Davis, 1989). In other words, the system is very simple to use. Therefore, the perception of user that the system is not difficult to use will probably influence his or her use intention. In relation to this, several studies were conducted with a view to finding the significant influence of PEOU on electronic system use. For example, Terzis and Economides (2011) have found that PEOU significantly influences intention to use Computer Based Assessment (CBA) system among undergraduate students. In a similar study, PEOU was found to have a direct effect on user intention for electronic air-ticketing. The above two findings are in consonance with the work of Suki and Suki (2011) that studied on use intention of 3G mobile in Malaysia. However, other studies (Chow, Herold, Choo, & Chan, 2012; Nasri & Charfeddine, 2012; Yaghoubi, 2010) uphold that PEOU does not have direct significant influence on user intention but only indirectly through PU. It is against this background that this study intends to find out the

significant influence of PEOU on the intention to use e-collection system among system users in Nigeria federal hospitals. Therefore, the following hypothesis is proposed:

H₁: Perceived ease of use significantly influences the intention to use electronic collection system among employees of Nigerian federal hospitals.

2.3. Computer Self-efficacy

According to [Compeau and Higgins \(1995\)](#) computer self-efficacy is the user perception on his or her ability to use computer and other information technology gadgets in carrying out a specific task. They further outlined three dimensions of computer self-efficacy. These dimensions are magnitude, strength and generalization. According to them, magnitude refers to the level of capability an individual has in carrying out a task with computers. Secondly, strength is the degree of confidence of an individual to accomplish a task with computers. Thirdly, generalizability refers to the capability of a person to complete assigned tasks using different platforms and or software. Besides, many studies of information system buttressed that CSE is a significant determinant of individual intention to use electronic systems ([Hayashi, Chen, Ryan, & Wu, 2004](#)). Therefore, computer self-efficacy is an appropriate factor in determining the ability of an individual to use e-collection systems. Evidently, the study of [Ariff et al. \(2013\)](#) has shown that CSE is a factor that influences the behavioral intention to use internet banking among bank customers. Similarly, the finding of [John \(2013\)](#) also indicates a significant influence of CSE on behavioral intention. Thus, CSE could be jointly used with PU and PEOU variables to examine its influence on the system users' intention to use e-collection system in Nigerian federal hospitals. Thus, this study proposes the following hypothesis:

H₂: Computer self-efficacy significantly influences the intention to use electronic collection system among employees of Nigerian federal hospitals.

3. Methodology

3.1. Population and Sample Size

The population of the study consists of 310 e-collection users from 26 federal hospitals located across the 19 northern states of Nigeria. Survey design was used in collecting primary data from the respondents through the use of a structured questionnaire. For fair of representation, stratified random sampling technique was employed in selecting the appropriate samples proportionate to the number of e-collection system users in the each category of hospital. There are three categories of federal hospitals in Nigeria and these are: Federal University Teaching Hospitals (FUH), Federal Medical Center (FMC) and Federal Specialty Hospital (FSH). In determining the sample size of the population, Krijcie and Morgan table was used. According to the table, for a population of 310, a minimum sample of 175 is required. However, the sample size was increased to 200 so as to deal with non-response issues and other sampling errors ([Hair, Wolfinbarger, Money, Samouel, & Page, 2010](#)). The details of the population and determination of sample size of the study are shown in [Table 1](#).

Table-1. Population of the Study and Sample Size.

Region	Population				Sample Size			
	FUH	FMC	FSH	TOTAL	FUH	FMC	FSH	TOTAL
North-East	51	40	9	100	33	25	6	64
North-West	51	40	45	136	33	25	29	87
North-Central	34	40	0	74	23	26	0	49
Total	136	120	54	310	89	76	35	200

Source: Generated by the researcher.

3.2. Instrument Development

In this study, questionnaire was developed and used for the data collection purposes. The questionnaire instrument has been designed in acquiescence with the modern research where measurements are adopted or adapted from prior related studies. Therefore, all the measurements on the instrument were adapted from prior related studies. Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Intention to Use (IU) were all adapted from the original TAM with little adjustments to suit the context of the study. Also, Computer Self-efficacy (CSE) construct was adapted with some modifications from the works [Compeau and Higgins \(1995\)](#) and [Cassidy and Eachus \(2002\)](#). In a nutshell, a total of 25 items were used to measure the study variables on a five point Likert scale ranging from (1 strongly disagree to 5 strongly agree) as presented in [Table 2](#).

Table-2. Questionnaire Items.

Variable	Item	Source
Perceived Usefulness	E-collection system will enable me to do my job more quickly.	Davis (1986).
	E-collection system will improve my performance.	
	E-collection system will enhance my effectiveness in my assigned duties.	
	E-collection system can enhance my productivity on the job.	
	E-collection system can make it easier for me to do my work.	
	Overall, e-collection system will be useful in my job.	
Perceived Ease of Use	I can easily use e-collection system without much stress.	Davis (1986).
	Learning of e-collection system will be interactive and easy for me.	
	E-collection system will be flexible to use.	
	Using e-collection system will be clear and understandable	
	Using e-collection system will make me more skillful in my job.	
	Overall, e-collection system will be easy to use in my assigned duties.	
Computer self-efficacy	I found working with computer very easy.	Compeau and Higgins (1995) and Cassidy and Eachus (2002).
	I am very sure of my ability to use computer.	
	I have no difficulty in using computer software.	
	I can learn computer software using the in-built help facility.	
	I can work with computer system even if no one tells me how to do it.	
	I consider myself to be skilled user of computer.	
Intention to Use	I intend to use e-collection at all time	Davis (1986).
	I predict that I will use e-collection system at all time in the future.	
	I believe my interest in e-collection system will increase in the future.	
	I'm willing to use e-collection in my duties.	
	In the future, I intend to use similar system to improve my job skills.	
	I am glad to learn new techniques using e-collection system.	

Source: Developed by the researcher.

4. Data Analysis

4.1. Data Collection Procedures

During the data collection workout, 200 questionnaires were distributed to the respondents (employees that work directly with the e-collection system in accounts and finance, audit, pharmacy and IT departments) of the surveyed hospitals. Out of the 200 questionnaires distributed, 124 were completed and returned representing 62% of response rate. However, eight questionnaires were not useful due to outlier issues and thus, only 116 were used for the analysis.

Equally, four cases were deleted during data screening due to outlier issues. In short, it is worth to know that, the study data has been screened and cleansed to ensuring that all missing values are being replaced with mean substitution (Tabachnick & Fidell, 2007) and outliers are deleted to guarantee reliable and valid result (Hair et al., 2010).

4.2. Non-Response Bias

Non-response bias was observed by subjecting all responses (received before and after the deadline of one week) to an independent samples t-test with a view to compare and identifies any possible significant difference that might occur between the two groups. The t-tests result shows insignificant difference between the early respondents and the late respondents.

4.3. Reliability of the Instrument

Statistically, the reliability and validity of instrument is to be ascertained to guarantee its consistency and cogency respectively. In this study, the reliability test was carried out using both Cronbach's alpha coefficient to test the internal consistency of the items on the instrument. Table 3 presents the results of the reliability test and interestingly, all the coefficient values are greater than 0.7 which implies that the instrument is reliable (Hair et al., 2010).

Table-3. Reliability Test.

Variable Name	No of items	Cronbach's alpha
Perceived Usefulness	6	.8546
Perceived Ease of Use	6	.7573
Computer Self-efficacy	7	.7872
Intention to Use	6	.8359

Source: Generated by the researcher using PLS 2.0.

4.4. The Measurement Model

Under measurement model, two validity tests are necessary. These are: convergent validity and the discriminant validity tests. Convergent validity is the degree to which multiple items agree in joining to measure the same concept. To assess the convergent validity of a model, factor loadings, composite reliability and average variance extracted are being employed. In view of this, the factor loadings were checked and found that only 1 item (PEU2) has factor loadings lower than the required minimum cut off value of 0.5 as suggested by Chin (1998) and thus, deleted from the analysis. Nonetheless, the remaining items are found to be reliable as each of the factor loading is greater than 0.5. The details of the loadings and others statistics are presented in Table 4.

Table-4. Factor Loadings.

Item	Factor Loading	Composite Reliability	AVE
PU1	0.625		
PU2	0.813		
PU3	0.847	0.8935	0.5883
PU4	0.874		
PU5	0.811		
PU6	0.583		
PEU1	0.683		
PEU3	0.731		
PEU4	0.812	0.8585	0.5117
PEU5	0.731		
PEU6	0.604		
CSE1	0.830		
CSE2	0.755		
CSE3	0.650		
CSE4	0.629	0.8462	0.5533
CSE5	0.597		
CSE6	0.630		
CSE7	0.648		
IU1	0.593		
IU2	0.613		
IU3	0.701	0.8799	0.5540
IU4	0.841		
IU5	0.802		
IU6	0.806		

Source: Generated by the researcher using PLS 2.0.

Secondly, Hair et al. (2010) maintained that for a construct to be reliable, its composite reliability must be greater than 0.7. Hence, in this case, the three constructs in this study have delivered this cut-off value and thus, reliable. Looking back at Table 3, the composite reliability of the four constructs viz: PU=0.8935, PEU=0.8585 CSE=0.8462 and IU=0.8799 are all greater than 0.7. Thirdly, Average Variance Extracted (AVE) is being used to determine the convergent validity and the value of AVE is expected to be higher than 0.5 (Hair et al., 2010). It is Interesting to see from Table 3 that the respective AVE values for PU, PEU, CSE and IU are 0.5883, 0.5117, 0.5533 and 0.5540 and therefore, the entire constructs in this study are reliable.

The next step is to assess the adequacy of discriminant validity. Discriminant validity is the degree to which items differentiate among construct or measure distinct concepts by examining the correlation between the measures of potentially overlapping constructs (Fornell & Lacker, 1981). Also, items are expected to load more on their own and the average variance shared between each construct and its measure should be greater than the variance shared between the construct and other construct (Compeau & Higgins, 1995). In Table 4, the calculated square root for each construct has exceeded the inter-correlations with the other constructs in the diagonal.

Table-5. Discriminant Validity.

Constructs	CSE	IU	PEOU	PU
CSE	0.6658			
IU	0.6064	0.7443		
PEU	0.5769	0.6506	0.7153	
PU	0.4106	0.3838	0.4502	0.7670

Source: Generated by the researcher using PLS 2.0.

4.5. Structural Model

The main aim of structural model is to test the research hypotheses. In this study, PLS algorithm and bootstrapping in Smart PLS 2.0 were used to test the three (3) hypotheses of this study and the result of the test is presented on [Table 5](#). Looking at the result on the table, it shows the relationship between PU and IU is not supported; however the results for the other two relationships are supported.

Table-6. Hypotheses Testing Results.

Hypotheses	Relationship	Beta	Standard Error	t-value	Decision
H1	PU -> IU	0.051	0.722	0.7026	Not Supported
H2	PEOU -> IU	0.435	0.953	4.7026	Supported
H3	CSE -> IU	0.335	0.993	3.3708	Supported

Source: Generated by the researcher using PLS 2.0.

5. Discussion of Results

5.1. Discussion

The main purpose of this study is to examine the influencing factors that lead to use intention of e-collection system among hospital employees in Nigeria. As such, three hypotheses were postulated to examine the relationship between perceived usefulness, perceived ease of use and computer self-efficacy on the intention to use e-collection system by users. After testing the relationships, it was found that the relationship between perceived usefulness and intention is not significant. However, there is strong relationship between perceived ease of use and intention. Equally, the relationship between computer self-efficacy and intention is significant. In other words, the relationship between perceived usefulness and intention to use e-collection system among employees is not significant ($\beta=0.051$, $t=0.7026$) and results to the rejection of hypothesis 1 as it was not supported. This implies that the perceived usefulness of e-collection system is not a significant factor that influences intention to use. Succinctly put, employees that are directly working with the system are using the system as a compulsory requirement for working condition in the hospitals without the knowledge of its usefulness. This finding is not consistent with most of the previous findings that relates to technology use. However, this finding is in agreement with system use in mandatory environment ([Laumer, Maier, Eckhardt, & Weitzel, 2016](#)). This implies that pre-requisite knowledge on the perceived usefulness through workshops and other capacity building is necessary for the users to increase their understanding on the usefulness of the system in the course of their job duties.

Perceived ease of use was also found as an important factor that influences intention to use the e-collection system. It explains the extent or degree of simplicity of the system, interactivity and its user-friendliness can induce employees to accept or continue to use (for those that have already started). Coinciding with the previous findings, perceived ease of use was found to have significant influence on the intention to use technology ([Suki & Suki, 2011](#); [Terzis & Economides, 2011](#)). Similarly, in this current study, perceived ease of use is found to be the most significant ($\beta=0.953$, $t=4.7026$) factor that influences users' intention to use the e-collection system in Nigerian federal hospitals. Therefore, this implies that users' technical knowledge of the system and their perception on its learning simplicity is the most valuable thing and the motivating factor towards usage intention. In fact, the functionalities features of the e-collection system like good user interface, user-friendliness and its simplicity are part of the important characteristics that induce employee users to accept and have the intention to use. In other words, the system would be resisted would by the employees if the system is not simple, flexible and understandable.

Furthermore, the analytical results from the analysis show that computer self-efficacy is also a significant ($\beta=0.335$, $t=3.3708$) factor that influences e-collection use. This means that users' ability to use computer system is a significant factor that can influence e-collection system use intention. In essence, this result indicates that the higher the computer self-efficacy of a user, the higher the intention to use the system. This finding is in consonance with the studies of [Chow et al. \(2012\)](#) and [Ariff et al. \(2013\)](#) which both have found that computer CSE is an important aspect that contributes to technology use intention at the individual level. Therefore, CSE is an external variable of TAM that could further explain individual feelings and behavior. As such, CSE is powerful in facilitating technology acceptance and its use among public sector employee. Consequently, this clearly shows that previous computer skills can enhance users' intention to use the e-collection system. Therefore, for employees to fully embrace the new system, government and hospital administrators need to devise proper means to educate and encourage staff to seek and apply computer skills in their daily work life.

In summary, the practical application of this study is to help the Nigerian government and hospital administrators to understand the technology related factors that influence public sector employees' intention to accept and use the e-collection system and other technologies as a whole. For example, perceived usefulness of e-collection system could be imparted in the minds of employee system users when proper orientation on its usefulness is provided. Equally, perceived ease of use could be achieved by enhancing the design and interface of the system which requires little effort to learn and use. Additionally, training in the form of seminars and workshops of existing e-collection system users should be organized and sponsored by the government.

5.2. Limitation of the Study

The sample size of the study covers only hospitals in northern Nigeria. Therefore, there is need for future studies to cover such part of the country to further validate the results of this study. In essence future studies are recommended to include all federal hospitals in the country. Furthermore, it is advised that further studies could test other technology acceptance models in the field of Information System with a view to further understand individual behavior with regards to intention of users to use e-collection system so that solutions could be provided on how best hospital authorities can motivate employees that works with the system appreciate its usage.

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