

An Investigation of the Factors Influencing the Utilization of E-Wallets in Higher Learning Institutions in Zambia Using Technology Acceptance Model

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Abstract—This study looked into the factors that influence the use of e-wallets in Zambian higher learning institutions. Based on the Technology Acceptability Model, this study presented an e-wallet acceptance model. Perceived ease of use, perceived utility, gender, perceived cost and perceived risk were all investigated as potential predictive variables. The Likelihood Ratio Test was utilized in this study, and the results showed that perceived ease of use and gender had a significant impact on students' use of e-wallets, whereas perceived usefulness, perceived cost and perceived risk had no effect. Perceived usefulness, on the other hand, came quite close. As a result, software developers that create e-wallets for students should make them as simple as possible to use. Additionally, e-wallet software developers should take into account preferences that appeal to each gender differently, as gender influences students' desire to use e-wallets.

Keywords—Perceived Ease of Use, Perceived Usefulness, Gender and Likelihood Ratio Test

I. INTRODUCTION

Mobile phones and other mobile communication devices have had a major social and economic influence on the world, and they are likely to continue to do so for many years to come [1]. The use of electronic wallets (e-wallets) to make payments is one area of mobile operations that has lately gained traction. According to [2] an e-wallet is a type of financial technology that allows users to save money, purchase products and services from both individuals and businesses, whereas [3] defines an e-wallet as the consumer device designed to store and manage electronic cash. In addition, e-wallets can be used to send money to other e-wallet users, make online purchases and pay bills. E-wallets are usually interoperable with e-commerce websites, which simplifies transactions [2].

Mobile payments encompass a wide range of financial transactions initiated using a mobile device [1]. This might be anything from a remittance sent to someone far away using only the mobile network operator's infrastructure to a credit card transaction done in a store using a mobile phone [4]. Mobile payments should not be considered a single type

of payment; the phrase encompasses a wide range of diverse classes and subclasses, each with its own set of advantages.

Globally, the mobile money industry has witnessed a significant growth over the last decade. This can be seen from having 30 million estimated active mobile money accounts globally in 2012 [5], to having 1.04 billion globally registered and active mobile money accounts in 2019, with \$1.9 billion worth of transactions being processed daily [6]. Naghavi further states that Sub-Saharan Africa continues to be the epicentre of mobile money, with over 50 million registered accounts in 2019. This was fuelled by substantial growth in Western Africa (21 million new accounts), Central Africa (6 million new accounts) and stable growth in Eastern Africa (22 million new accounts).

Mobile money provides numerous advantages, particularly for low-income and rural users. Remittances (domestic and/or international) at a cheaper cost, bill payment, salary distribution, retail payments, money savings, credit, and insurance are some of the services that mobile money services facilitate [7]. E-wallet services, according to Zeinab, provide mechanisms for converting physical currency into electronic money (e-money) in a customer's mobile account and bank-to-mobile account transfers. In addition, in the wake of the Covid-19 epidemic, mobile money services (e-wallets) are being utilized to reduce physical cash exchange in order to limit Covid-19 spread [8].

Due to the rise in the number of students studying in higher learning institutions, frustrating queues and overcrowding in most financial institutions have characterized the payment of student fees. Furthermore, after depositing the funds, a student is required to submit the stamped deposit slip obtained from the financial institution to the higher institution of learning to confirm that he or she has paid. In the higher learning institution, the delivery of stamped deposit slips is also characterized by long, unbearable queues and overcrowding. Most higher learning institutions have made little to no concerted efforts to address the emerging problem faced by students, particularly when registering and paying student fees. This study investigated the characteristics that influence the use of e-wallets by

students at higher learning institutions in order to propose a blockchain-based e-wallet for easier payment of student fees.

II. LITERATURE REVIEW

For this study, Technology Acceptance Model (TAM) was considered. This model is primarily used to forecast user acceptance of information systems and to comprehend the motivations and potential challenges that users may experience. Through the construction of an extended framework, it is a model that integrates the Reasoned Action Theory (TRA) and the Planned Behaviour Theory (TPB) [9].

The TAM is seen as a model that describes the purpose of use better than others [10]. According to Davis [9], preceding research suggests two determinants that are particularly important among many variables that can influence system usage. The first is whether or not users have the intention to use the technology. Perceived usefulness is the name of this variable. This is the extent to which a person believes his or her job performance would be enhanced by using a particular system [9]. This implies that mobile payment systems need a competitive advantage for accepting them. Secondly, while potential users may perceive that a given software is valuable, they may also perceive that it is too difficult to use, and that the performance gains are offset by the work required to utilize it. This attribute is called perceived ease of use. That is, the extent to which a person believes it would be effortless to use a particular system [9]. It indicates that the easier a mobile payment system is to use, the more likely it is to be adopted by users. Many researchers [11], [12] and [13] applied the TAM to different information systems and technologies. Chandra et al conducted a study where they compared bank-based e-wallets to telecommunication-based e-wallets. The authors used TAM as the basis of conclusion for their findings [2]. In addition, Nag and Gilitwala in their study, used the constructs of TAM to look at the elements that influence people's willingness to utilize e-wallets in Bangkok, Thailand [27].

Although the TAM offers numerous advantages, including superior measuring properties, conciseness, and common consumer and methodological soundness [14], the downside of this model, according to [15], is that it offers broad, user-friendly information and has also been criticized for its parsimony by several researchers.

Perceived usefulness (PU) was one of the two dimensions of the TAM originating from [9]. [13] further argued that a technology or software system's effectiveness may be measured by its user acceptance, which is based on three factors: perceived usefulness (PU), perceived ease of use (PEOU), and system attitude. If a technology or software system is not user friendly, then it should not be deemed useful [9] and [16]. This is in line with the original concept of PU and PEOU as the extent to which a person believes that using a specific technology or software system will improve his or her job performance and the extent to which the consumer perceives that using a particular technology will be effort-free, respectively [9]. In turn, a technology with a high perceived usefulness is likely to have a user who believes in the link between positive use and performance [9].

Users are more inclined to embrace a technology or software system that is seen to be easy to use than another.

[9]. Many of the studies found PU and PEOU to be important [17], [18], [19], [14], [20], [21], [22], [13] and [23].

With the constructs drawn from TAM, this study proposed a conceptual framework as illustrated in Figure 1.

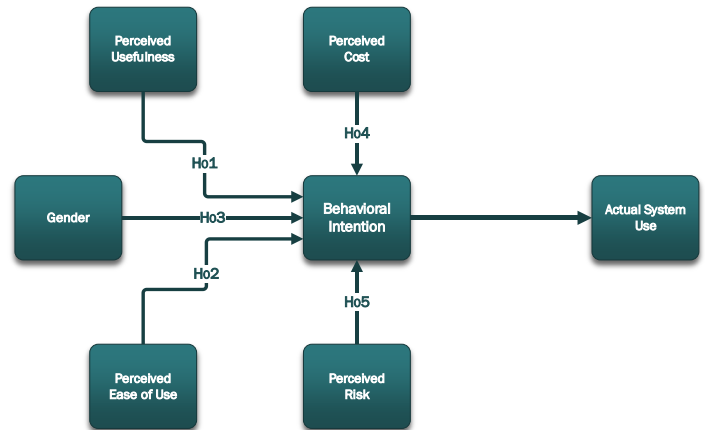


Figure 1. Conceptual Framework

The following are the hypotheses used in this study;

- 1) H₀₁: Perceived usefulness does not influence the usage of e-wallets by students in higher learning institutions.
- 2) H₀₂: Perceived ease of use does not influence the usage of e-wallets by students in higher learning institutions.
- 3) H₀₃: Gender influences the usage of e-wallets by students in higher learning institutions.
- 4) H₀₄: Perceived cost does not influence the usage of e-wallets by students in higher learning institutions.
- 5) H₀₅: Perceived risk does not influence the usage of e-wallets by students in higher learning institutions.

III. METHODOLOGY

A. Study Design

In this study, the cross-sectional design method (quantitative approach) was used. According to [24], a cross-sectional design involves the study of a particular phenomenon (or phenomena) in a population at one specific point in time. Where the phenomenon being investigated in this study was the utilization of e-wallets among students in higher learning institutions. A cross-sectional study allowed the researcher to collect a great deal of information at a particular time. In addition, the researcher was able to collect data inexpensively using questionnaires.

B. Variables

In this study, the use of e-wallets was the dependent variable in this study, with perceived usefulness, perceived ease of use, gender, perceived cost and perceived risk being the independent variables.

C. Study Site and Population

This study's participants were sampled from four higher learning institutions offering accommodation facilities for

students. These institutions are the University of Zambia’s great east campus, National Institute of Public Administration (NIPA), Evelyn Hone College and Mulungushi University. The four institutions were considered for this study because the target population constituted of students who could easily be sampled from the campuses’ hostels and who used e-wallets.

The inclusion criteria were students studying at the sampled higher learning institutions and were accommodated in the institutions’ accommodation facilities while the exclusion criteria were students studying at the sampled higher learning institution but were not accommodated in the institutions’ accommodation facilities.

D. Sampling

Stratified random sampling was used for selecting the hostels at the higher learning institutions whose occupants were then selected for participation in this study. Stratified random sampling is where the population is broken down into strata (or subgroups) and from each subgroup a random sample is taken [25]. A subgroup is a natural set of items. The rationale for using stratified random sampling in this study was because subgroups in the form of hostels had been established which fulfilled the condition for using stratified random sampling technique.

E. Sample Size

The following formula derived from [25] was used for calculating the number of participants.

$$n = \frac{Z^2 p(100 - p)}{E^2} \tag{1}$$

Where

- **n** is number of participants
- **Z** is the value corresponding to level of confidence required at 95%= 1.96 confidence level
- **P** is the percentage occurrence of a state or condition which is 0.5
- **E** is the percentage maximum error required which is 0.05

As a result, the minimum sample size was 210, and 23 of these were rejected due to incomplete questionnaire responses, leaving a survey population of 187 respondents.

F. Data Collection

The study documented quantitative data on the utilization of e-wallets by students in the sampled higher learning institutions. A total of 187 semi-structured questionnaires were used to collect quantitative data. The questionnaires were personally distributed by the researcher.

G. Data Management and Analysis

The quantitative data were entered into a computer and analyzed statistically using SPSS v25 software so as to generate tables of frequencies and associations. The Multinomial Logistic Regression’s Likelihood Ratio Test was used for determining the significance of the associations between the dependent and independent categorical variables, at a 5% level of significance.

IV. RESULTS

It can be seen from Table I that the study involved 187 students from the sampled higher learning institutions, and, out of these, 162 (86.6%) were active users of e-wallets, 8 (4.3%) were not frequent users of the same, 9 (4.8%) had never used e-wallets before and remaining respondents (n=8,4.3 %) did not provide responses with regards to their utilization of e-wallets.

It can further be stated that among the 162 respondents who actively used e-wallets for their day-to-day transactions, 143 (88.3%) who were the majority agreed to using e-wallets because they found them useful. Also, of the 162 e-wallet users, 138 (85.2%), who too were the majority, used e-wallets because they perceived them as being easy to use. However, when asked whether they perceived the e-wallets as being costly or not, 95 (58.2%) out of 162 users were of the view that e-wallets were costly, in spite of them using them. In addition, when asked whether there were any associated risks when using e-wallets, 89 (54.9%) out of 162 agreed to finding the use of e-wallets risky.

The results in the Table II show that at a 5% level of significance, perceived ease of use (p-value = 0.038 < 0.05) and the gender of the user (p-value = 0.009 < 0.05) significantly influenced the utilization of e-wallets by the students. However, the variables perceived usefulness (p-value = 0.089 > 0.05), perceived cost (p-value = 0.284 > 0.05) and perceived risk (p-value = 0.503 > 0.05) did not have a substantial impact on the use of electronic wallets.

stability of the parameters of the Multinomial Regression Model above was examined using the Deviance and Pearson chi-square Goodness of Fit tests, which are useful for determining whether a model exhibits fit to the data or not. Non-significant test results are indicators that the model fits the data.

The results of both the Pearson and Deviance chi-square stability tests in Table III indicate that the model fits the data well. This is because the p-values for both Pearson Chi-Square test (1.00) and the Deviance Chi- Square test (1.00) were greater than 0.05, thus indicating non-significant results, at a 5% level of significance.

TABLE I. MODEL STABILITY TEST

Goodness-of-Fit			
	Chi-Square	Df	Sig.
Pearson	139.793	284	1.000
Deviance	95.587	284	1.000

TABLE II. CHARACTERISTICS OF STUDY POPULATION

Factors influencing e-wallet utilization	Active user of e-wallets n=162 (86.6%)	Not a frequent user of e-wallets n=8 (4.3%)	Never used e-wallets before n=9 (4.8%)	Missing Responses n=8 (4.3%)
Gender 1. Male 2. Female 3. Missing Responses	79 (48.8%) 83 (51.2%)	6 (75%) 2 (25%)	5 (55.7%) 4(44.4%)	3 (37.5%) 5 (62.5%)
Perceived to be Useful 1. Agree 2. Neutral 3. Disagree 4. Missing Responses	143 (88.3%) 16 (9.9%) 1 (0.6%) 2 (1.2%)	8 (100%)	6 (66.7%) 3 (33.3%)	2 (25%) 6 (75%)
Perceived to be Easy to Use 1. Agree 2. Neutral 3. Disagree 4. Missing Responses	138 (85.2%) 18 (11.1%) 5 (3.1%) 1 (0.6%)	6 (75.0%) 1 (12.5%) 1 (12.5%)	5 (55.6%) 4 (44.4%)	3 (37.5%) 5 (62.5%)
Perceived to be Costly 1. Agree 2. Neutral 3. Disagree 4. Missing Responses	95 (58.6%) 50 (30.8%) 16 (9.9%) 1 (0.6%)	7 (87.5%) 1 (12.5%)	5 (55.6%) 2 (22.2%) 2 (22.2%)	3 (37.5%) 5 (62.5%)
Perceived to be Risky 1. Agree 2. Neutral 3. Disagree 4. Missing Responses	89 (54.9%) 36 (22.2%) 33 (20.4%) 4 (2.5%)	6 (75%) 1 (12.5%) 1 (12.5%)	3 (33.3%) 6 (66.7%)	1 (12.5%) 7 (87.5%)

TABLE III. MULTINOMIAL LOGISTIC REGRESSION’S LIKELIHOOD RATIO TEST RESULTS

Dependent Variable: Utilization of mobile e-wallets by respondents				
Method: Multinomial Logistic Regression’s Likelihood Ratio Tests				
Sample Size: 187 Respondents				
Independent Variables:				
Mobile wallets are useful (perceived usefulness)				
Easy to carry out transactions using mobile wallets (perceived ease of use)				
Gender of respondent				
Transaction costs on mobile wallets are fair (perceived cost)				
Risk of abuse or theft of user’s information when using e-wallets (perceived risk)				
Effect	Model Fitting Criteria – 2 Log Likelihood of Reduced Model	Likelihood Ratio Tests		
		<i>Chi-Square</i>	<i>df</i>	<i>Sig.</i>
Intercept	124.262	.000	0	.
Perceived usefulness (Mobile wallets are useful)	132.325	8.062	4	0.089
Perceived Ease of Use (Easy to carry out transactions using mobile wallets)	134.417	10.155	4	0.038
Gender of Respondent	137.770	13.508	4	0.009
Perceived Cost (Transaction costs incurred from mobile wallet usage are fair)	129.295	5.032	4	0.284
Perceived Risk (Risk of abuse or theft of user’s information when using mobile wallets)	127.597	3.335	4	0.503

V. DISCUSSION

A. Effect of Gender on Users’ Utilization of E-Wallets

It was observed from the study findings that the gender distribution of the sampled respondents was almost even, with a slight difference of 2%, where the females, who made up the majority, represented a total of 51.9% (92 out of 187), while the males made up a total of 48.1% (90 out of 187). The distribution of gender in this study reduced gender bias,

thus making the inferences more reliable due to the fact that no sex had an unfair representation over the other.

The findings of the statistical inference further established that, at a 5% level of significance, gender significantly influenced the utilization of e-wallets. This finding suggests that it was imperative for software developers of mobile e-wallets to take into consideration the various concerns arising from the differences in gender, as this strongly influences the users’ decision to either use a certain e-wallet or not. This finding is not surprising, as even

in corporate institutions such as banks, certain products they offer are specifically designed to satisfy the interests of a particular gender over the other. This also highlights the need for e-wallet software developers to incorporate features in e-wallets that are intended to meet the specific needs of consumers with respect to their gender. The finding indicating that gender has a significant influence on the users' utilization differs from [26] finding, who used an extended UTAUT model, but established that gender did not significantly influence the users' choice of adopting the usage of technology.

B. *Perceived Usefulness and Utilization of E-Wallets*

When questioned on whether respondents found the utilization of mobile wallets useful or not, most of the respondents represented by 51.9% (97 out of 187) strongly agreed to finding the utilization of mobile wallets useful to them, with the other 33.2% (62 out of 187) agreeing to the same. Hence, on average, about 85% (159 out of 187) respondents found e-wallets useful for their day-to-day activities. The researcher thus concluded that one of the reasons the respondents used some of the available e-wallets on the market was due to their perceived usefulness.

When a statistical inference was made between the variable utilization of e-wallets and perceived usefulness, at a 5% level of significance, the findings showed an insignificant relationship between the two variables. However, in spite of rejecting that a significant relationship existed between the two stated variables, statistics still shows that the relationship between the two variables was quite strong, such that if it was to be tested at a 10% level of significance, the relationship could have been significant.

Thus, the researcher submits that it is imperative for anyone considering to develop a mobile e-wallet to ensure the wallet incorporates features that make it useful to users, if the e-wallet is to penetrate the market and be utilized. This submission stems from the fact that some studies conducted by other scholars, such as those by [17], [22] and [19] at a 5% level of significance, all demonstrated a substantial relationship between perceived usefulness and technology or software system usage.

C. *Perceived Ease of Use and Utilization of E-Wallets*

Several elements were evaluated when it came to the ease of use: ease of facilitating transactions when using e-wallets, ease of registration for an e-wallet, steps required when carrying out transactions, ease of error reversal when using mobile wallets, and respondents' take on how clear and understandable the instructions were involving the mobile wallets' operations.

When the respondents were questioned on which of the factors stated above would be best associated with the ease of use of e-wallets, most of the respondents represented by 78.1% (146 out of 187) were of the view that few steps required when carrying out transactions using e-wallets best described the ease of use that respondents experienced when utilizing e-wallets. This was seconded by the ease of facilitating transactions using e-wallets and also the ease of registration for a mobile wallet account, both represented by 42.2% (79 out of 187). Therefore, from these findings, it can be observed that most of the respondents found an e-wallet easy to use when it required few steps to carry out a transaction.

When a statistical inference was made between the variable utilization of e-wallets and easy-to-carry-out transactions using mobile e-wallets, at a 5% level of significance, the findings showed a significant relationship between the two variables. This finding proposes that when an e-wallet is easy to use or user-friendly, the likelihood of it being accepted by users is high. This is because complex e-wallets tend to consume more time and effort for users as they try to figure out how to go about carrying out transactions. This decreases the user's willingness to use a certain e-wallet again in the future, when easy-to-use solutions are readily available that can serve a similar function and facilitate payments in a less complicated manner. These findings are comparable to those of [27], [14], and [21], who found a substantial link between the simplicity of use of technology and its use by its users.

VI. CONCLUSION

The purpose of this study was to look at the factors that influence students' use of e-wallets in higher learning institutions. The study made use of a proposed conceptual model that derived its constructs from TAM in order to establish the possible determinant factors of e-wallet utilization. Three factors were considered as potential determinants of e-wallet utilization among students in higher learning institutions.

Using the Multinomial Logistic Regression's Likelihood Ratio Tests, the findings of the study have shown that at a 5% level of significance, two variables significantly influenced the students' utilization of e-wallets. These variables are the user's perceived ease of use and gender. It was also observed that perceived usefulness came very close in being a significant determinant of e-wallet utilization; this is because, at a 10% level of significance, it would have produced a statistically significant result.

As a result of the outcomes of this investigation, developers of e-wallets for use by students should always strive to make them as simple to use as possible, because complex programs are not appreciated by consumers in this market. Additionally, when developing mobile e-wallets, it is critical for developers to consider the numerous preferences that appeal differently to each gender of the product's customers, as gender plays a big part in influencing the users' decision to use or not use an e-wallet.

VII. LIMITATION AND RECOMMENDATION

This study had a relatively smaller sample size of 187, as such generalization of the findings may to some extent not present the actual picture of the factors influencing utilization of e-wallets in all higher learning institutions in Zambia. This study, however, remains valuable because it provides relevant information on factors influencing the use of e-wallets in higher learning institutions in developing countries and therefore suggests that other scholars consider undertaking a similar study, but must consider having a comparatively larger sample size. Furthermore, concerning the perceived cost and perceived risk, the study's findings revealed that the existence of neutral responses was very high, therefore, this finding opens the way for further analysis of cost and risk as factors that need greater scrutiny.

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