Conceptual Model of Factors Determining Students' Behavioural Intention of Using Mobile Payment System in Nigerian Tertiary Institutions

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ABSTRACT

This study examined factors determining students' behavioural intention of using mobile payment systems in Nigerian tertiary institutions. A descriptive survey design was employed and a conceptual model comprising of 9 independent variables (i.e. trust, mobility, compatibility, network externality, mobile payment knowledge, convenience, risk, subjective norm and cost), three belief (ease to use, usefulness, safe to use), and one dependent variable (behavioural intention to use). The items for each construct were adapted from the previous validated constructs in literatures with little modification to suit the objectives of the study. An incidental random sampling technique was used to select four hundred respondents from each institution making a total of two thousand. Seventeen hypotheses were formulated for the study and data collected were analysed using stepwise regression analysis at 0.05 level of significant. The results of the study showed that convenience, subjective norm and mobile payment knowledge have significant impact on ease to use with subjective norm having the strongest impact on the ease to use than others. Similarly, mobility, convenience, compatibility, subjective norm, ease to use and safe to use have significant impact on the usefulness with subjective norm having the strongest impact on the usefulness than others. Also, both the risk and trust have significant impact on the safe to use while risk has strongest significant impact on the safe to use. Finally, the results also indicated that safe to use, ease to use, usefulness, cost and network externality have significant impact on the behavioural intention to use with network externality have strongest impact on the behavioural intention to use. Therefore, mobile payment service providers should consider safety as a crucial determinant toward students' intention of using mobile payment system and prioritize their system by building a system that are trustworthy, easy to use, reliable and protect customer's privacy. Also, mobile payment service providers should take cognizance of people's social connections, network and status when deployed their system in order to potentially increase the use of mobile payment services and they should ensure that their services are aligned with customers' current values, needs and lifestyles.

Keywords: Compatibility, Mobile Payment System, Near Field Communication, Network Externality, Point of Sale,

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1. INTRODUCTION

Advanced Information and Communication Technologies (ICT), such as smart phones and ubiquitous Internet access, increase the mobility of individual's life activities (Xin, Techatassasoontorn and Tan, 2012). The growth in mobile phone subscriptions has led to an increase in mobile applications, social networking and online games, as well as a growing consumer interest in mobile payments (Xin et al., 2012).

Mobile technologies have not only become widespread rapidly, but they currently also have the advantage of reaching the customers for firms (Dastan and Gurler, 2016). Mobile technologies have lots of advantages against other technologies, such as interacting with anybody in anywhere, being in use individualistically, customized information and services, and getting quick answers from users (Dastan and Gurler, 2016).

International Data Corporation had forecast that there are more than 2 billion people use mobile devices to get online in 2016 and those populations will keep growing in 25% rate in next five years (Yeh and Tseng, 2017). That is, more and more consumers are going to use mobile devices instead of personal computer in the future and e-commerce will turn into m-commerce (Yeh and Tseng, 2017). With the rapid development of information technology, mobile payments play crucial role to the m-commerce system (Yeh and Tseng, 2017).

The increasing of customer's needs in mobility when payment for transaction has created requirement for a new payment tool allowing the transactions more feasible and convenient (Ondrus and Pigneur, 2006). The current payment method gives consumers solvency that is beneficial in dealing with medium and large amount of money (Tai and Liu, 2015). It is inconvenient for customers in small denominations of coins or pennies when making micro-payments (Tai and Liu, 2015). Moreover, consumers must pay high costs for micro-payments when using existing payment services (Mallat, 2004). So mobile payments has been proposed as a new service tool provided for micro-payments in e-commerce and mobile phone creates a certain advantage to customers when they have a need for small transactions (Menke and De Lussanet, 2006; Ondrus and Pigneur, 2006).

Mobile payment is defined as a type of payment transaction processing in which a mobile device is utilized to initiate, authorize, confirm and complete a payment (Goeke and Pousttchi 2010). Mobile payments fall broadly into two categories: point of sale (POS) contactless payments and mobile remote payments (Xin et al., 2012). The first requires both buyer's and seller's presence to complete transactions (Xin et al., 2012). Technology applied here is contactless radio technologies including near field communication (NFC), Bluetooth or infrared technologies. The latter represents payment that is made through either SMS (e.g., paying for car parks or paying at petrol stations) or wireless application protocol (WAP) (e.g., using mobile Internet to make a purchase) (Xin et al., 2012).

Bank for International Settlements (2012) defined the mobile payments as payments initiated and transmitted by access devices that are connected to the mobile communication network using voice technology, text messaging (via either SMS or USSD19 technology) or NFC. This means that not only traditional mobile phones but also other devices such as tablet computers can serve as access devices for mobile payments. There are three types of mobile payments including branded mobile wallets from banks or credit card providers such as t-wallet in Taiwan, smartphone or wearable-based payments such as Apple pay, and branded mobile wallets from retailers such as Starbucks (Yeh and Tseng, 2017).

Mobile payment is defined as a transaction method which money is transferred from one person to another through a mobile device without intermediate (Liu and Tai, 2016). The most common way to conduct transactions by mobile phone service is to send messages with predefined structure to the object to be traded (Menke and De Lussanet, 2006). Payments for goods and services are then charge to the customer's mobile phone bill or deducted from prepaid airtime of prepay subscribers (Liu and Tai, 2016). Instead of using a message to the transaction when using the old technology of cell phone, the advent of smart phones provide a payment method by mobile phone through internet connection of smart phone (Liu and Tai, 2016).

Research shows that mobile payment has a promising future and firms should invest in the development and promotion of this payment method (Microsoft and M-com, 2009). However, Pope et al. (2011) in their study suggests that mobile payment is still in its infancy. Similarly, MasterCard (2012a) conducted the study in 34 countries and reported that none of the countries has reached an inflection point in which mobile payments account for a major share of payments mix. To achieve a successful implementation of mobile payment services, it is crucial to understand the extent of consumers' knowledge of mobile payments and their concerns about mobile payments. A review of mobile payment studies suggests that consumers express great concerns about privacy and security in mobile payments (Au and Kauffman, 2008). Therefore, mobile payment systems should be designed to foster consumer confidence, reduce their uncertainties and perceived risks to increase the likelihood of wider consumer acceptance.

Research about factors affecting user's intention to use mobile payment is considered interesting to researchers and practitioners, because financial institutions, trusted third parties, payment service providers, and system software and supporting service providers can benefit greatly from enhanced understanding of the key factors underlying mobile users' intention (Dahlberg, Mallat and Öörni, 2003; Ondrus and Pigneur, 2006). Moreover, different user groups may perceive m-payment advantages differently and adopt new payment technologies accordingly. There is a need to understand the user-group level behaviour, but there is little attempt to fill a gap in the user-group level research. In the light of the current state of the existing research on m-payment, the objective of this study is to empirically access the determinants of the intention to use m-payments. In order to achieve this objective, I propose a research model used by Tai and Liu (2015) with addition of four independent variables (i.e. Accessibility, Network externality, Subjective norm and Cost) making a total of 9 independent variables instead of six used by Liu and Tai (2016) (Trust, Mobility, Compatibility, Network externality, Mobile payment knowledge, Convenience, Risk, Subjective norm and Cost), three belief variables (Ease to use, Usefulness, Safe to use), and one Behavioural intention to use variable.

2. LITERATURE REVIEW

Mobile technologies make life easier progressively and have numerous advantages for the companies to reach customers (IAB, 2010). Features such as individual use, personalized information and services as well as feedbacks from users make mobile technologies superior (Barnes, 2002). Mobile payment refers to products, services, and billing based on mobile devices and has the advantage of being able to use the convenience of wireless infrastructure and other communication technologies (Dahlberg, Mallat, Ondrus and Zmijewska, 2008). Mobile payment system (MPS) can be defined as a payment system in which mobile devices are used to initiate, activate, and/or confirm any payment (Karnouskos, Hondroudaki, Vilmos and Csik, 2004). In short, MPS is a payment that is conducted with a mobile device, such as smartphones and tablets. Combining these two definitions, MPS is like a kind of electronic payment system, but when we compare MPS with electronic payment systems, it has more mobility. In an earlier study of mobile payments, Kreyer, Pousttchi and Turowski (2002) demonstrated that consumers are generally interested in using mobile payment applications. Mobile settlement has been proposed as a solution for the activation of the electronic trading market (Ondrus and Pigneur, 2006). There are also a number of studies showing that mobile payment has successfully settled into the market, including billions of dollars in profitable mobile content, Paypal, and mobile payments in public transit (Menke and De Lussanet, 2006).

A number of studies have applied the Technology Acceptance Model (TAM) or the Diffusion of Innovation (DOI) Theory among existing mobile payment services (Menke and De Lussanet, 2006). Yang (2005) adopted TAM to explore the factors influencing Singaporeans' attitudes toward using mobile commerce. Schierz, Schilke and Wirtz (2010) also applied TAM to understand the factors determining users' acceptance of mobile payment services. In general, there are studies that investigate whether the theoretical model of research affects users' intentions or actual use (Dahlberg, et al., 2003), or whether they are ready to accept mobile payment services (Dewan and Chen, 2005).

Many studies have examined consumer acceptance intentions by adding factors that are considered important in mobile payment services (Ji-Yun and Deaho, 2015). The fifteen key variables of the typical mobile payment service are: price, convenience, compatibility, self-expression, mobility, network externality, observability, testability, personal information security, system security, perceived risk, social impact, quality, technical concern, and trust (Ji-Yun and Deaho, 2015).

First, the analysis of mobile payment services focuses on the perceived price—that is, the transaction cost and the registration cost. Kleijnen, Wetzels and Ruyter (2004) added the perceived cost and social influence as a new factor in the technology acceptance model; both factors had a significant effect on the intention to use. Zmijewska, Lawrence and Steele (2004) also investigated the effect of perceived price on the attitudes of users and their motivation to use services.

Pousttchi (2003) verified that the concept of convenience—a combination of ease of use and transaction time, centered on the value-added theory—influenced the mobile payment process. In addition, Zmijewska et al. (2004) have demonstrated that mobility, a typical feature of mobile devices, is also an important factor in the intention to use mobile payment services. Mallat (2007) adds a new criterion: the network mass externality and the critical mass, which is the minimum mass for diffusion, through qualitative research using focus group interviews.

In addition, personal information security (i.e. worries about the collecting and use of personal information) has also been proved to be an important factor in mobile payment services (Chen, 2006). Dewan and Chen (2005) investigated information security as an important cross-platform factor in the United States. Dahlberg et al. (2003) demonstrated that trust and security factors have a significant influence on the use of mobile payment services, and are important factors for consumers in payment method.

Kim, Mirusmonov and Lee (2010) conducted a research study in Korea on how the following factors (innovativeness, m-payment knowledge, mobility, reachability, compatibility, convenience, perceived usefulness and perceived ease of use) affect the adoption of MPS, and the findings of their study reported that the most important indicators of adoption of MPS are perceived usefulness and perceived ease of use. Yang, Lu, Gupta, Cao and Zhang (2012) found that behavioural beliefs, social influence and personal traits have direct and significant influence on the adoption of MPS.

Ji-Yun and Deaho (2015) uses extended technology acceptance model (TAM) with the network externality as center in order to identify the factors that determine consumer continuance intention to use of the SNS based mobile payment service. The results indicate that user continuance intentions are influenced by constructs of perceived ease of use, perceived usefulness, attitude, accessibility, compatibility and trust. Specifically, the model also confirms that both of the direct network externality and indirect network externality effect on intention significantly.

Khanda, Gilbert and Waliro (2015) applied TAM model to evaluate factors determining mobile payment adoption in Kenyan secondary schools. Data regarding these factors was collected through the use of questionnaires that were sent to respondents including school managers and administrators. The study findings reveal that mobile payment mechanisms, perceived ease of use, perceived usefulness, management support, security and financial policy are significant factors influencing adoption of mobile payment in Kenyan secondary schools. However, referents influence was found to be an insignificant influence of mobile payments adoption.

Nguyen, Cao, Dang and Nguyen (2016) applied C-TAMTPB to discuss consumers' intentions to use mobile payment services in Vietnam. The results of their study shown that mobile payment service providers should focus on building up consumer trust, and make the system understandable and easy to use. Also, Dastan and Gurler (2016) uses TAM model to investigate the factors affecting adoption of mobile payment systems by the consumer in Turkey. 225 individuals were surveyed online through convenience sampling method. A research model was developed and proposed relationships were tested using structural equation modeling. The empirical findings point out that perceived trust, perceived mobility and attitudes positively affect the adoption of Mobile Payment Systems (MPS); perceived usefulness and perceived ease of use have no effect on adoption of MPS. Furthermore, perceived reputation is positively related to perceived trust and finally environmental risk is negatively related to perceived trust.

Despite this high level of growth, however, there is also a belief that mobile payments are not as fast or as prevalent as previously expected (Ondrus and Pigneur, 2006). The majority of studies have been conducted especially on consumers in the US and Europe, which have led the proliferation of mobile payment services; there is a lack of research on new services in Africa especially, Nigeria. Therefore, this study used extended technology acceptance model (TAM) to explain the factors determining students' behavioural intention of using mobile payment system in Nigerian tertiary institutions. The study used 9 independent variables (i.e. Trust, Mobility, Compatibility, Network externality, Mobile payment knowledge, Convenience, Risk, Subjective norm and Cost), three belief variables (Ease to use, Usefulness, Safe to use), and one Behavioural intention to use variable.

1.1 Conceptual Framework Model

The conceptual framework model of this study applied similar model used by Liu and Tai (2016) with the addition of three new constructs added to the independent variables (i.e. Network externality, Subjective norm and Cost). Therefore, the conceptual framework model of the study now consists of 9 independent variables (i.e. Trust, Mobility, Compatibility, Accessibility, Network externality, Mobile payment knowledge, Convenience, Risk, Subjective norm and Cost), three belief variables (Ease to use, Usefulness, Safe to use), and one Behavioural intention to use variable. The conceptual framework model used in this study is shown as Figure 1.

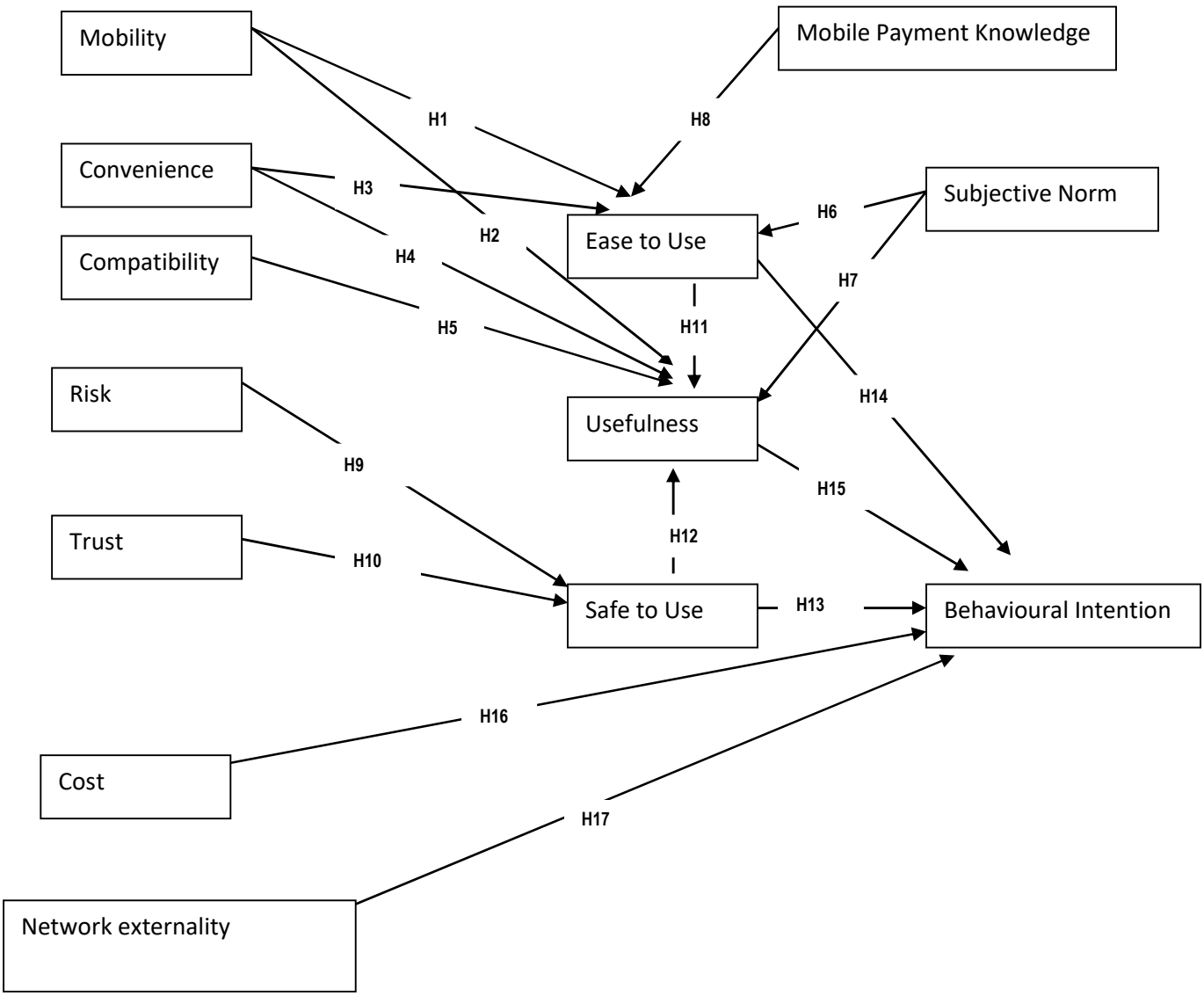

Figure 1: Conceptual Framework Model of the Study
(Adapted from Liu and Tai, 2016; Ji-Yung and Deaho, 2015; Mohammad, 2016)

2.1 Research Hypotheses

Based on the conceptual model of the study, the following hypotheses were formulated and tested:

H1: Mobility positively affects the ease to use of the mobile payment system in Nigerian tertiary institutions.

H2: Mobility positively affects the usefulness of the mobile payment system in Nigerian tertiary institutions.

H3: Convenience positively affects the ease to use of the mobile payment system in Nigerian tertiary institutions.

H4: Convenience positively affects the usefulness of the mobile payment system in Nigerian tertiary institutions.

H5: Compatibility positively affects the usefulness of the mobile payment system in Nigerian tertiary institutions.

H6: Subjective norms positively affect the ease to use of the mobile payment system in Nigerian tertiary institutions.

H7: Subjective norms positively affect the usefulness of the mobile payment system in Nigerian tertiary institutions.

H8: Mobile payment knowledge positively affects the ease to use of the mobile payment system in Nigerian tertiary institutions.

H9: Risk positively affects safe to use of the mobile payment system in Nigerian tertiary institutions.

H10: Trust positively affects safe to use of the mobile payment system in Nigerian tertiary institutions.

H11: Ease to use positively affects usefulness of the mobile payment system in Nigerian tertiary institutions.

H12: Safe to use positively affects usefulness of the mobile payment system in Nigerian tertiary institutions.

H13: Safe to use positively affects behaviour intention to use of the mobile payment system in Nigerian tertiary institutions.

H14: Ease to use positively affects behaviour intention to use of the mobile payment system in Nigerian tertiary institutions.

H15: Usefulness positively affects behaviour intention to use of the mobile payment system in Nigerian tertiary institutions.

H16: Cost positively affects behaviour intention to use of the mobile payment system in Nigerian tertiary institutions.

H17: Network externality positively affects behaviour intention to use of the mobile payment system in Nigerian tertiary institutions.

2.2 Constructs in the Research Model

Mobility

Mobility is determinant used to measure the degree to which an individual perceives received benefits in the context of time, space, and services access. One of the important elements of mobile technology is portability. It is a big advantage of mobile payment services to provide consumers the ability to use the services wherever they want and they can comparing to traditional payment methods (Amberg, Hirschmeier and Wehrmann, 2004). The new mobile payment method is flexible to use regardless of time and space and has a great fit in today mobile and active lifestyle. It allows customers to access into the services through a wireless network and a range of mobile devices including smart phones (Au and Kauffman, 2008). In the conventional electronic commerce, in which transactions are conducted regularly via wireless internet, mobile payment is the service to allow users to access information accurately and effectively at any location, regardless counting time (Anckar and D'Incau, 2002).

Convenience

Convenience is the ease and the comfort of use as well as the attainment of concrete benefits through the use driven from portability and immediate accessibility (Sharma and Gutiérrez, 2010). Perceived convenience can be define as agility, accessibility, and availability of a service, which is flexible in time and location. Convenience has been pointed out to be a benefit of using mobile computing; it is one of determinants of the success of mobile payment services (Xu and Gutierrez, 2006).The convenience of the new tool offers users space, time and access speed; it helps consumers use the service more easily, and it also improves the performance of payments (Clarke, 2001). In addition, mobile payment services offer consumers the ability to integrate the modern technology with the traditional payment methods via mobile device. Consumers can utilize the availability of the method in all situations to reduce the pressure of time (Mallat, Rossi and Tuunainen , 2006). In the context of small transactions, mobile payment services help consumers reduce transaction cost; it also helps them eliminate the inconvenience of coins and currency.

Compatibility

For a new service as mobile payment, consumers' ability to integrate it into their shopping habits and daily lifestyle is an important element; it is one of the determinants of the success of mobile payment services (Teo and Pok, 2003). Compatibility is the combination of the values of innovation, the potential and available values; it is also the integration and effective operation of new technologies to enhance job performance (Lee, McGoldrick, Keeling and Doherty, 2003). Compatibility is a factor relating to innovation adopted for mobile payment services, interoperability of mobile services with user needs and lifestyle, and ability to try out a new service; it raises the awareness of usefulness to customers when using the service (Ding, Ijima and Ho, 2004 ; Mallat, 2004). In addition, customers' expectations about the possibility of completing the work easier make compatibility a considerable factor that affects the perceived ease of use (Tornatzky and Klein, 1982).

Mobile payment knowledge

Customer knowledge relates to their understandings, needs, desires and goals when they use mobile payments. Schreier and Prügl (2008) found that users with high level of knowledge in an innovation tend to be ahead of its market trend and expect high benefits from innovation, and those users would adopt new commercial products faster and more intensively than ordinary ones. Marcketti and Shelley (2009) also pointed out that consumers' knowledge of products has a significantly positive effect on their perceived ease to use. Customer knowledge can help them identify what mobile payment can do for them, and why the products/services are important to them. Furthermore, customers will consider what they will gain from the tools comparing with what they are having at the time regarding the services' quality, prices, insurance of privacy, etc. Customers will use mobile payments easily and efficiently if customers have a high level of knowledge about the tool they are conducting for mobile payments.

Trust

Customer trust is a substantially important factor for the success of new services as mobile payment services. Trust is the willingness of individuals to take risks with desire that their needs will be met. It is the possibility that one party will perform their duties in an honest manner consistent with the expectations of the party trust (Kim, Shin and Lee, 2009). The transactions conducted through a mobile network are vulnerable and more uncertain than traditional settings, thus entail greater potential risk. Trust in the payment system will help reduce the need to understand, control, and monitor activities, thereby allowing customers to use services easily and efficiently without much effort in translation of online service (Mu noz, Esparza, Aguilar, Carrascal and Forne, 2010). Customers have a high confidence level for the mobile payment services will feel the honesty and reliability of the service providers; it will make customers increase the intent to use service (Gefen, Karahanna and Straub, 2003). Besides, while making a transaction, the consumer is paying for the services they want. During that process, they expect their personal information must be guaranteed and not shared with any inappropriate parties (Zhou, 2011).

Risk

Risk is defined as the lack of security during paying process due to unexpected errors or transactions made without honesty between the buyer and the seller (Havlena and DeSarbo, 1991). Risk is also regarded as the loss of information leading to financial losses due to the disturbing hacker (Ganesan, 1994); the risk is the unexpected, unintended, and undesired loss (Pavlou, 2003). The evaluation of risk level is calculated by the level at which an individual expects a possible negative results or errors when a transaction is being proceeded (Peter and Tarpey, 1975). In the context of mobile technology, risk is expected and acceptable; it is what customers have to take at a certain level of danger when trying a new service (Sweeney, Soutar and Johnson, 1999). Mobile payment is a form of online transactions. It will include those transactions occurring between individuals unknown to each other which increase the risk of financial loss, and the uncertainty about the identity or the quality of products. Without appropriate measures, the faulty transaction that is possibly occurred may result in unwanted loss for customers and potential larger costs for providers.

Ease to use

For the contemporary service as mobile payment, one thing that customers will certainly question is whether or not it is easy to use; this is a significantly important factor affecting the intention to use mobile payment services of customers (Moore and Benbasat, 1991). The ease to use is defined as the level at which users would believe that using a new service is simple, easy, and effortless (Davis, 1989). Perceived ease to use refers to the clear and understandable interaction that users experience with the new system, and it is also about how comfortable they feel when using the system to do what they want (Ndubisi and Jantan, 2003). Theoretically, the ease of use is perceived when a customer feel the new invention is not difficult to understand, to learn and to use (Rogers, 1962). For this reason, ease of use is considered to be one of the important factors affecting the acceptance and use of the new technologies by users. In addition, perceived ease of use is proposed to be an antecedent of the perceived usefulness (Davis, Bagozzi and Warshaw , 1989). Consumers easily using the service will generate the high-performed results, and they can simply integrate many new applications of new services in their daily life activities.

Usefulness

Beside the ease of use, customers will be concerned about the usefulness of the new services which is also a crucial factor in determining the customers' adaption to the change, thus usefulness is one of the determinants of the intention to use new services as mobile payment services by customers (Venkatesh and Davis, 2000). Usefulness is defined as customer feeling about the potentiality of a new service to provide many benefits for them and to help improve their job performance when using the service (Mathwick, Malhotra and Rigdon, 2001). It will measure the willingness to adapt something new compared to traditional values of the customers (Tan and Teo, 2000). Likewise, the behaviour of the users will be determined by the perception of a higher level of benefits achieved when using the service (Adams, Nelson and Todd, 1992).

Safe to use

Besides ease of use and perceived usefulness, with new services such as mobile payment services, customers will definitely be concerned about the safety issues when they have intention to use the service; it becomes an indispensable element for the success of mobile payment services (Gefen et al., 2003). According to Egger (2001), perceived safe to use is the trust in any payment system that ensures user's information to be confidential and secured with high levels. It is also about the amount of control that users have and the reliable level of providers. Customers have to believe that the transaction will be completed as expected and any data will not be shared with parties not fit (Chellappa and Pavlou, 2002). Safety of customers' information is very important for all businesses to serve clients; customers need to feel safe when making a purchase and wait for the completion of transactions with no worry.

The significance of customer safety in general against e-commerce and e-banking in particular and is the critical factor when the risk level of economic transactions in a virtual environment is higher than in the traditional environment (Grabner-Krauter and Kaluscha, 2003). Safe to use not only has been found to be a prerequisite for e-banking environment (Kassim and Abdullah, 2006), it also affects the intention to use mobile payment services of customers (Suh and Han, 2002). Therefore, the perceived security can increase number of customers to make transactions in an online environment. When users trust the safety of the service, they will comfortably enjoy the benefits that services provide. Thus, safe to use significantly affects customer when using electronic banking services (Alsajjan and Dennis, 2006).

Subjective Norm

Subjective Norm can be viewed as the degree to which an individual is influenced by the opinions of others who may be important to him or her when considering a particular activity (Fishbein and Ajzen, 1975). Subjective Norm is an important factor early in the uptake of m-payment services, particularly when people may not be knowledgeable about the practicalities of the service (Yang et al., 2012). Users may experience feelings of uncertainty regarding the consequences of using m-payment services and may, in turn, opt to consult other users regarding their opinions and experiences through social networks (Liébana-Cabanillas, Sánchez-Fernández and Muñoz-Leiva, 2014). Furthermore, the effect of Subjective Norm on behavioural intentions is anticipated to be stronger for users who have no experience, as they are more likely to rely on others' reactions to inform their intentions. Subjective Norm can be viewed as a measure of the influence of important peers and/or other social groups, including friends, parents, and colleagues, on a person's intention to adopt m-payment services.

Cost

Additional costs may be associated with the use of m-payment services, such as the cost of acquiring a mobile phone, transactional fees to use the service, and ongoing access and maintenance costs. Thus, cost reflects whether and how an individual considers m-payment service use to impose additional financial costs beyond his or her current situation (Luarn and Lin, 2005). Indeed, Zhou (2011) suggested that cost is an important determinant that can negatively influence consumer intentions regarding m-payment services. Given its importance, researchers have suggested that cost should be included in the model when investigating m-payments (Ho Cheong and Park, 2005).

Network externality

Network externalities influence exists when the benefit of using a product increases as the number of people using it increases (Haruvy and Prasad, 1998). Payment systems are subject to the network externality effect (Van Hove, 2001). In mobile payment context, customers seem to be sensitive towards the number of technology users, and they consider the large customer base a prerequisite for the adoption decision (Dahlberg and Mallat 2002; Mallat 2007). Moreover, the more merchants offer mobile payment services the more willing the customers are to accept them (Au and Kauffman 2008).

3. RESEARCH METHODOLOGY

3.1 Research Design, Population and Sampling:

The descriptive research design of the survey type was employed in the study. The population of the study consists of all students in the following tertiary institutions in Oyo State (i.e. Emmanuel Alayande College of Education, Oyo, Federal College of Education (Special), Oyo, Federal School of Surveying, Oyo, The Polytechnic, Ibadan, College of Agriculture, Igboora. An incidental random sampling technique was utilized to select 400 students from each institution making a total sample of 2000.

3.2 Instrument

Structured questionnaire which was made of two sections was used as an instrument for data collection. The first section sought information on demographic information of the respondent, the second section consists of 43 items measuring thirteen potential determinants and the third section consists of 3 measure items for behavioural intention to use mobile payment services. All these measurement items were adapted from the previous questionnaires used in related studies (Chen, 2008; Moore and Benbasat, 1991; Schierz et al., 2010; Nguyen, Cao, Dang and Nguyen, 2016; Dastan and Gurler, 2016; Yu and Tao, 2007; Katz and Shapiro, 1992; Kim et al., 2010; Luarn and Lin, 2005; Wei, Marthandan, Chong, Ooi and Arumugamu, 2009; Venkatesh,Thong and Xu, 2012; Peng, Xu and Liu, 2011) and analyzed by five-point Likert-type scales anchored at 1 for “strongly disagree” and 5 for “strongly agree”.

3.3 Validity and Reliability of the Instrument

Since the items were adapted from previous questionnaires used in related studies, it is believed that such might have undergone validation process. This in part justifies the validity of the questionnaire. However, after development, the questionnaire was given to two experts who are knowledgeable in research for scrutiny. To test the reliability and validity of the data collection instrument, the instrument was administered on 50 respondents who did not eventually participated in the study. A test-retest reliability method of two weeks interval was embarked upon. Data collected was subjected to Cronbach Alpha and the reliability coefficient returned an = 0.8345. Table 1 depicted the Cronbach Alpha reliability coefficient of the instrument.

3.4 Method of Data Collection and Analysis

The researcher administered the questionnaires personally with the assistance of some lecturers in each institution at their respective departments. The questionnaire administration covered ten days (two day for each institution). A total of 2000 copies of questionnaire were administered and all were returned completely. Collected data was analysed using descriptive statistics including mean, percentages and frequency count. ANOVA and multiple regressions were also performed to determine which of the factors best determine students’ attitudes toward the use of mobile payment services in Nigerian tertiary institutions.

4. RESULTS

4.1 Reliability Measures

The descriptive statistics and cronbach's alpha coefficient of this survey are shown in table 1 below. The cronbach's alpha was calculated to test the reliability of the questionnaire. The reliability of this survey was tested for thirteen factors based on the framework structure of this study.

Hair, Anderson, Tatham and Black (1998) presented the Cronbach's alpha should be higher than 0.7; this means that it has high reliability (Cronbach, 1971; Nunnally, 1978). The reliability of all variables in this study is higher than 0.7, which is so high thus, it can be concluded that the questionnaire has a high internal consistency.

Table 1 : The Cronbach's Alpha Coefficient

Variable	Cronbach's Alpha	Number of items
Compatibility	0.841	3
Ease of Use	0.764	4
Usefulness	0.830	3
Trust	0.781	3
Network Externalities	0.724	3
Convenience	0.800	4
Mobile Payment Knowledge	0.771	3
Mobility	0.828	3
Subjective Norm	0.711	3
Cost	0.997	4
Risk	0.749	4
Safe to Use	0.867	3
Behavioural Intention	0.982	3
All Variables	0.897	43

Source: Survey, 2017

4.2 The Result of Factor Analysis

Exploratory Factor Analysis (EFA) is a technique to evaluate interdependence (Liu and Tai, 2016). It studies all interrelationships without defining variables to be dependent or independent. In this study, EFA is applied to test the model with Kaiser-Meyer-Olkin (KMO) and Bartlett's test by using the Principal Axis Factoring with Promax rotation. KMO is an index used to examine the appropriateness of factor analysis. High values of KMO (between 0.5 and 1.0) and Bartlett's test with statistical significance level less than 0.05 indicate the factor analysis is appropriate. In other words, values below 0.5 imply that factor analysis may not be appropriate (Gerbing and Anderson, 1988; Rietveld and Van Hout, 1993; Field, 2000). Gerbing and Anderson (1988) insisted that principal-axis factoring is relatively equal in their capacities to extract the correct model and is more commonly reported in social and behavioral science research reports than principal components with varimax rotation. To ensure the practical significance of EFA, factor loading should be equal or higher than 0.5 (Hair et al., 1998). In this study, the factor analysis process with KMO is about .779 (> 0.5), Bartlett's test with statistical significance level of .000, which are showed in Table 2.

Table 2 : KMO and Bartlett's Test

Variable		Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.841
Bartlett's Test of	Approx. Chi-Square	121446.639
	Df	903
	Sig.	0.000

Source: Survey, 2017

4.3 Convergent Validity of the Research and Goodness-of-fit of this Structure Model

Factor loading, Composite Reliability (CR) and Average Variance Extracted (AVE) are uses to evaluate the convergent validity of the research constructs. Factor loading>0.7 (Xu, 2014), CR>0.7 (Bagozzi, 1981) and AVE>0.5 (Fornell and Larcker, 1981) are the thresholds of reaching convergent validity. All the CR and AVE of the research construct above the recommended values and were shown in Table 3 below.

Table 3 : Convergent Validity of the Research Model

Construct	CR	AVE
Compatibility	0.845	0.674
Ease of Use	0.826	0.605
Usefulness	0.881	0.752
Trust	0.849	0.695
Network Externalities	0.892	0.784
Convenience	0.876	0.748
Mobile Payment Knowledge	0.873	0.736
Mobility	0.852	0.699
Subjective Norm	0.837	0.622
Cost	0.886	0.761
Risk	0.872	0.733
Safe to Use	0.895	0.792
Behavioural Intention	0.904	0.798

Source: Survey, 2017

The goodness-of-fit of this structure model was evaluated by indexes such as Chi-Square Statistics (CMIN), Root Mean Square Residual (RMR), Goodness of fit index (GFI) and Adjust goodness of fit index (AGFI). According to the suggestions of Chou and Bentler (1995), Bryne (1998), Joreskog and Sorbom (1993), the structure model can be considered as good fit with CMIN/DF≤2, RMI≤0.8, GFI and AGFI≥0.9. In addition, RMSEA, NFI, CFI and IFG should be all larger than 0.9. The goodness-of-fit statistics and the threshold of all the goodness-of-fit indexes were shown in Table 4 below.

Table 4 : The Goodness-of-fit Statistics

Goodness-of-fit Index	Actual Value	Recommend Value
CMIN/DF	1.875	≤2
GFI	0.902	≥0.9
RMR	0.780	≤0.8
RMSEA	0.794	≤0.8
AGFI	0.916	≥0.9
NFI	0.923	≥0.9
CFI	0.967	≥0.9
IFI	0.970	≥0.9

Source: Survey, 2017

The coefficient of determination R^2 and adjusted R^2 are 0.576 and 0.575 respectively. In this model, four factors (mobility, convenience, subjective norm and mobile payment knowledge) considered in the model 1 accounts for 57.5% on ease to use of mobile payment system shown in table 5 below.

The results of the significant test of regression model F value of 676.825 and sig. f is 0.000 indicates that the model has a significant statistic and it indicates the "goodness" of fit of the model. According to (Field, 2013), for the model to have significant statistic meaning, the F change value should be greater than 10.

In addition, convenience (β =0.200, t (1995) = 3.030, p< 0.05), subjective norm (β =0.521, t (1995) = 3.943, p< 0.05) and mobile payment knowledge (β =0.379, t (1995) = 3.399, p< 0.05) contributed significantly to the regression model. That is, ease of use of mobile payment systems by the students were facilitated by the convenience of the system, social interactions of the students and mobile payment knowledge of the students. However, mobility (β =0.048, t (1995) = 1.949, p> 0.05) did not influence ease of use of mobile payment system. Also, by examining the standardized regression coefficients, subjective norm (β = 0.521) appeared to be the strongest predictor that contributed to the variance in ease to use of mobile payment system, followed by mobile payment knowledge (β = 0.379) and convenience (β = 0.200) respectively.

Table 5: Regression Model for Mobility, Convenience, Subjective Norm and Mobile Payment Knowledge against Ease of Use (N=2000)

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	0.759	0.576	0.575	1.461

Analysis of Variance

Model 1	Sum of Squares	DF	Mean Square	F	Sig.
Regression	5778.049	4	1444.512	676.825	0.000
Residual	4257.823	1995	2.134		

Coefficient of the Prediction (N=2000) ** Significant at 0.05

Model 1	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig.
Ease of Use (Constant)	1.327	0.233		5.705	0.000**
Mobility	0.034	0.018	0.048	1.949	0.510
Convenience	0.138	0.011	0.200	3.030	0.000**
Subjective Norm	0.585	0.017	0.521	3.943	0.000**
Mobile Payment Knowledge	0.351	0.023	0.379	3.399	0.000**

Source: Survey, 2017

The coefficient of determination R^2 and adjusted R^2 are 0.840 and 0.839 respectively. In this model, six factors (mobility, convenience, compatibility, subjective norm, ease to use and safe to use) considered in the model 2 accounts for 83.9% on usefulness of mobile payment system shown in table 6 below.

The results of the significant test of regression model F value of 1740.882 and sig. f is 0.000 indicates that the model has a significant statistic and it indicates the "goodness" of fit of the model. According to (Field, 2013), for the model to have significant statistic meaning, the F change value should be greater than 10.

In addition, mobility (β =0.099, t (1993) =9.926, p< 0.05),convenience (β =0.204, t (1993) = 5.869, p< 0.05), compatibility (β =0.187, t (1993) = 9.192, p< 0.05), subjective norm (β =0.734, t (1993) = 8.816, p< 0.05), ease to use (β =0.161, t (1993) = 12.369, p< 0.05) and safe to use (β =0.095, t (1993) = 2.731, p< 0.05) contributed significantly to the regression model. That is, usefulness of mobile payment systems to the students were facilitated by the mobility of the system, convenience of the system, compatibility of the system, social interactions of the students, ease of use of the system and safe to use of the system. Also, by examining the standardized regression coefficients, subjective norm (β = 0.734) appeared to be the strongest predictor that contributed to the variance in the usefulness of mobile payment system, followed by convenience (β = 0.204), compatibility (β = 0.187) and ease to use (β = 0.161) respectively.

Table 6: Regression Model for Mobility, Convenience, Compatibility, Subjective Norm, Ease of Use and Safe to Use against Usefulness (N=2000)

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
2	0.916	0.840	0.839	0.893

Analysis of Variance

Model 2	Sum of Squares	DF	Mean Square	F	Sig.
Regression	8328.156	6	1388.026	1740.882	0.000
Residual	1589.043	1993	0.797		

Coefficient of the Prediction (N=2000) ** Significant at 0.05

Model 2	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig.
Usefulness (Constant)	1.229	0.133		9.255	0.000**
Mobility	0.071	0.007	0.099	9.926	0.000**
Convenience	0.140	0.024	0.204	5.869	0.000**
Compatibility	0.143	0.016	0.187	9.192	0.000**
Subjective Norm	0.819	0.013	0.734	8.816	0.000**
Ease of Use	0.160	0.013	0.161	12.369	0.000**
Safe to Use	0.066	0.024	0.095	2.731	0.006**

Source: Survey, 2017

The coefficient of determination R^2 and adjusted R^2 are 0.098 and 0.097 respectively. In this model, two factors (risk and trust) considered in the model 3 accounts for 9.7% on safe to use of mobile payment system shown in table 7 below. The results of the significant test of regression model F value of 107.884 and sig. f is 0.000 indicates that the model has a significant statistic and it indicates the "goodness" of fit of the model. According to (Field, 2013), for the model to have significant statistic meaning, the F change value should be greater than 10.

In addition, risk (β =0.313, t (1997) =4.689, p< 0.05) and trust (β =0.111, t (1997) = 1.523, p< 0.05) contributed significantly to the regression model. That is, safe to use of mobile payment systems were facilitated by the risk of the system and trust that students have in the system. Also, by examining the standardized regression coefficients, risk (β = 0.313) appeared to be the strongest predictor that contributed to the variance in the safe to use of the mobile payment system, followed by trust (β = 0.111) respectively.

Table 7: Regression Model for Risk and Trust against Safe to Use (N=2000)

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
3	0.312	0.098	0.097	3.076

Analysis of Variance

Model 3	Sum of Squares	DF	Mean Square	F	Sig.
Regression	2042.081	2	1021.041	107.884	0.000
Residual	18900.141	1997	9.464		

Coefficient of the Prediction (N=2000) ** Significant at 0.05

Model 3	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig.
Safe to Use (Constant)	3.955	0.734		5.388	0.000**
Risk	0.460	0.031	0.313	4.689	0.000**
Trust	0.073	0.139	0.111	1.523	0.001**

Source: Survey, 2017

The coefficient of determination R^2 and adjusted R^2 are 0.638 and 0.637 respectively. In this model, five factors (safe to use, ease to use, usefulness, cost and network externalities) considered in the model 4 accounts for 63.7% on behavioural intention to use mobile payment system shown in table 8 below.

The results of the significant test of regression model F value of 702.411 and sig. f is 0.000 indicates that the model has a significant statistic and it indicates the "goodness" of fit of the model. According to (Field, 2013), for the model to have significant statistic meaning, the F change value should be greater than 10.

In addition, safe to use (β =0.210, t (1994) =3.901, p< 0.05), ease to use (β =0.072, t (1994) = 3.596, p< 0.05), usefulness (β =0.105, t (1994) = 5.318, p< 0.05), cost (β =0.035, t (1994) = 2.571, p< 0.05) and network externalities (β =0.718, t (1994) = 12.942, p< 0.05) contributed significantly to the regression model. That is, behavioural intention to use mobile payment systems by the students were facilitated by the safe to use, ease to use, usefulness, cost and network externalities. Also, by examining the standardized regression coefficients, network externalities (β = 0.718) appeared to be the strongest predictor that contributed to the variance in the behavioural intention to use mobile payment system, followed by safe to use (β = 0.210), usefulness (β = 0.105) and ease to use (β = 0.072) respectively.

Table 8: Regression Model for Safe to Use, Ease to Use, Usefulness, Cost and Network Externalities against Behavioural Intention (N=2000)

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
4	0.799	0.638	0.637	1.193

Analysis of Variance

Model 4	Sum of Squares	DF	Mean Square	F	Sig.
Regression	4998.040	5	999.608	702.411	0.000
Residual	2837.440	1994	1.423		

Coefficient of the Prediction (N=2000) ** Significant at 0.05

Model 4	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	t	Sig.
Behavioural Intention (Constant)	8.127	0.301		26.996	0.000**
Safe to Use	0.128	0.009	0.210	3.901	0.000**
Ease to Use	0.063	0.018	0.072	3.596	0.000**
Usefulness	0.093	0.017	0.105	5.318	0.000**
Cost	0.048	0.019	0.035	2.571	0.010**
Network Externalities	2.871	0.054	0.718	12.942	0.000**

Source: Survey, 2017

Table 9 shows that the empirical data are fully support the relationships between convenience, subjective norm, mobile payment knowledge and ease of use. The convenience (H3), subjective norm (H6) and mobile payment knowledge (H8) have positive impact on ease to use significantly. Mobility (H1) does not have impact on ease to use. Also, the empirical data are fully support the relationships between mobility, convenience, compatibility, subjective norm, ease to use, safe to use and usefulness. The mobility (H2), convenience (H4), compatibility (H5), subjective norm (H7), ease to use (H11) and safe to use (H12) have positive impact on usefulness significantly. Likewise, the empirical data are fully support the relationships between risk, trust and safe to use. The risk (H9) and trust (H10) have positive impact on safe to use significantly. Finally, the empirical data are fully support the relationships between safe to use, ease to use, usefulness, cost , network externalities and behavioural intention. The safe to use (H13), ease to use (H14), usefulness (H15), cost (H16), network externalities (H17) have positive impact on behavioural intention.

Table 9: The Result of Hypotheses Test

Paths	Coefficient	t-value	Sig.	Supported
H1: Mobility ⟶Ease of use	0.048	1.949	0.510	NO
H2: Mobility ⟶Usefulness	0.099	9.926	0.000	YES
H3: Convenience ⟶ Ease of use	0.200	3.030	0.000	YES
H4: Convenience ⟶ Usefulness	0.204	5.869	0.000	YES
H5: Compatibility ⟶Usefulness	0.187	9.192	0.000	YES
H6: Subjective norm ⟶ Ease of use	0.521	3.943	0.000	YES
H7: Subjective norm ⟶ Usefulness	0.734	8.816	0.000	YES
H8: Mobile payment knowledge ⟶Ease of use	0.379	3.399	0.000	YES
H9: Risk ⟶ Safe to use	0.313	4.689	0.000	YES
H10: Trust ⟶Safe to use	0.111	1.523	0.001	YES
H11: Ease to use⟶ Usefulness	0.161	12.369	0.000	YES
H12: Safe to use ⟶ Usefulness	0.095	2.731	0.000	YES
H13: Safe to use ⟶ Behavioural Intention	0.210	3.901	0.000	YES
H14: Ease to use⟶ Behavioural Intention	0.072	3.596	0.000	YES
H15: Usefulness ⟶ Behavioural Intention	0.105	5.318	0.000	YES
H16: Cost ⟶ Behavioural Intention	0.035	2.571	0.010	YES
H17: Network externalities ⟶Behavioural Intention	0.718	12.942	0.000	YES

Source: Survey, 2017

5. DISCUSSION OF THE FINDINGS

The influence of **H3, H6** and **H8** is confirmed revealing that convenience, subjective norm and mobile payment knowledge influence the ease of use of mobile payment system. This results are consistent with previous studies which indicated that convenience, subjective norm and mobile payment knowledge influence the ease of use of mobile payment system (Liu and Tai, 2016; Mohammad, 2016). For mobility (**H1**), this finding contradict the result of Liu and Tai (2016) which revealed that mobility had a positive influence on the ease to use of mobile payment system. The influence of **H2**, **H4**, **H5**, **H7**, **H11** and **H12** was also confirmed with the hypotheses having a significant influence on the usefulness of the mobile payment system. This result is similar to previous studies findings which revealed that mobility, convenience, compatibility, subjective norm, ease to use and safe to use influence the usefulness of mobile payment system (Liu and Tai, 2016; Mohammad, 2016; Qasim and Abu-Shanab, 2015). Risk (**H9**) and trust (**H10**) was found to influence the safe to use of mobile payment system. This finding supports the findings of the Liu and Tai (2016).

Ease of use (**H14**) has a significant influence on behavioural intentions. This means that despite the fact that students in Nigerian tertiary institutions place some importance on mobile payment ease of use, the high penetration and daily usage of mobile phones make ease of use for this relatively new mobile based technology more important. This finding is similar to previous findings which revealed that ease of use influence the behavioural intention to use mobile payment system (Alshare, Gradon and Miller. 2004; Thakur 2013; Wu, Univ, Kaohsiung, Tao and Yang, 2007; Liu and Tai, 2016; Khanda, Gilbert and Waliaro, 2015). But this finding contradicts the findings of the previous studies that revealed that ease of use not influence the behavioural intention to use mobile payment system (Hu, Chau, Sheng and Tan, 1999; Mohammad, 2016; Qasim and Abu-Shanab, 2015; Phonthanukitithaworn, Sellito and Fong, 2016).

As indicated in the previous section, usefulness is a significant predictor of students' behavioural intention to use mobile payment system of mobile payment (**H15**). These results suggest that the students' in Nigerian tertiary institutions put a high value on the relative advantage of the technology. They believe that mobile payment carry a possible improvement for their performance and transactions. It is expected that students compare the expected advantage of using current payment methods to using mobile payment when deciding to adopt such technology. These results come in line with previous research (Alshare et al. 2004; Peng et al. 2011; Thakur 2013; Liu and Tai, 2016; Qasim and Abu-Shanab, 2015; Hu, Chau, Sheng and Tan, 1999; Mohammad, 2016).

The model proposed in this study extended the TAM with three important variables: cost, network externalities and safe to use. Cost was a significant predictor of behavioural intention to use mobile payment system (**H16** was also supported). Cost has been identified as a major barrier to the subsequent uptake of mobile payment system. Specific mobile payment costs, such as transaction fees, new headset costs, subscription fees, and communication access, all contribute to incremental cost increases associated with the use of these services (Ho Cheong and Park, 2005; Keramati, Taeb, Larijani and Mojir, 2012; Lu, Yang, Chau, and Cao, 2011; Luarn and Lin, 2005; Tsu Wei, Marthandan, Chong, Ooi, and Arumugam, 2009; Wu and Wang, 2005). This study found a significant effect of cost on student' behavioural intentions to use mobile payment system. This result was likely observed because most of the students are acutely aware of all the incremental expenses experienced through their use of mobile payment system.

Safe to use was a significant predictor of behavioural intention to use mobile payment system (**H13** was also supported). It is important for students to be able to trust the technology as well as the service provider prior to using mobile payment for conducting any financial transaction. Also, students are likely to have certain expectations about the risks associated with mobile payment system, providers of these types of services would benefit from clearly articulating their ability to protect critical information during the transaction process. This assurance might be provided through satisfaction guarantee policies that protect users from the harmful consequences of service failure or through offers of potential user training and trial use activities. Mobile service providers should particularly focus on building trust and making their payment services easy to use. In order to enhance trust, service providers should increase services' security and reliability, reduce transaction errors, and protect consumers' privacy.

Network externalities were found the most significant predictor of behavioural intention to use mobile payment system (**H17** was also supported). This factor uniquely predicted 71.8 % of students' behavioural intentions to use mobile payment system. Clearly students are more likely to use mobile payment if enough merchants accept this payment method, they also strongly believe that the more merchants provide this payment option and the more people using it the less it will cost them. The creation of critical mass is crucial in driving students' acceptance of mobile payment system. This finding supports previous research that indicates the existence of the network externalities effect in technology acceptance in general (Dahlberg and Mallat 2002; Mallat 2007), and in mobile payment in particular (Au and Kauffman 2008; Qasim and Abu-Shanab, 2015).

6. IMPLICATION OF THE STUDY

The theoretical contribution of this study is that the study has successfully extended the TAM by including compatibility, subjective norm, risk, trust, cost and network externalities. The integrated model provides a clearer explanation of behavioural intentions than the TAM alone. It advances the understanding of key mobile payment intention to use attributes in the context of mobile-based financial service consumption. Finally, the model and its constructs can be replicated or extended to different economies to determine whether the findings are similar or otherwise. Findings of this study provides empirical evidence on the influence of number of determinants (e.g. safe to use, ease to use, usefulness, cost and network externalities) on the behavioural intention of the students' in Nigerian tertiary institutions. The findings of this research give support to the validity of the extended TAM model. The special intention that the students gave to the effect of network externalities, implies that it is important for service providers to build a critical mass. Students seem to be willing to use mobile payment services if there are enough merchants that provide this payment method, and large size of users of such technology. Trust is also an issue to bear in mind, the willingness of students to accept this payment service is very much tied to their ability to trust the technology as much as it's about trusting its service provides.

Managing the organization image and creating a trustworthy brand name may have to precede offering mobile payment service. Also, the strong impact of subjective norm on the perceived usefulness of mobile payment system demonstrates that intention to use mobile payment system can serve as a means to reinforce individuals' social connections and social status through group affiliation (Qasim and Abu-Shanab, 2015). The practical implication of this finding is that service providers must consider people's social connections, networks, and status to potentially increase the use of m-payment services. Accordingly, promoting m-payment services through a social or community network may be a useful approach for m-payment service providers (Phonthanukitithaworn et al., 2016).

Risk and trust are embedded in safe to use construct and it was found that safe to use strongly influence the behavioural intention of the students to use mobile payment system. This finding implies that service providers should ensure a strong security system when offering m-payment services to customers. For instance, the application of a mobile digital signature and highly secure passwords when conducting transactions can ensure the confidentiality and authenticity of an m-payment system (Tan and Lau, 2016). In addition, building trust among users of mobile payment system should also be made a strategic priority, as they may discontinue their use of mobile payment services if they sense a lack of trust in m-payment entities. According to Zhou (2014), consumer trust can be built by providing a positive user experience. Therefore, to provide users with a positive experience, the entities involved in mobile payments should ensure that the mobile payment system is reliable, free of technical errors, and highly responsive to their inquires or to any problems that might arise.

Significant effect of perceived usefulness and perceived ease of use on the students' behavioural intention to use mobile payment system in Nigerian tertiary institutions is confirmed. The finding implications is that for student to continued using of mobile payment services in Nigeria, will be determined by their perception of the services easy to use and usefulness to the user. Therefore mobile operators should continue rolling out the flexible, portable and user friendly services in such a way to meet the needs of the students. Finally, this study indicates that a cost increase has a negative effect on students' intentions to use mobile payment services as they are aware of all the incremental expenses that they experience in their use of mobile payment services. Thus, service providers must highlight the value of mobile payment services vis-à-vis traditional payment services and emphasize the functional advantage of using mobile payment services to demonstrate that the benefits gained justify the cost. In addition, creative promotional and pricing strategies, including cost reductions, should be implemented to attract price-conscious customers (Qasim and Abu-Shanab, 2015).

7. CONCLUSION

The study examined the factors that influence the students' behavioural intention to use mobile payment system in Nigerian tertiary institutions. A conceptual model was developed which comprises nine external variables (mobility, convenience, compatibility, subjective norm, mobile payment knowledge, risk, trust, cost and network externality), three belief variables (ease of use, usefulness and safe to use), and one dependent variable (behavioural intention to use Mobile payment system).

The findings of this research have important means for the improvement and growth of mobile payment services in Nigeria. Students' behavioural Intention to use is essential for the growth of mobile payment services. According to the findings of this study, ease to use, usefulness, safe to use, cost and network externality have the direct impact on students' behavioural intention to use mobile payment system. Moreover, factors which directly affect ease to use are convenience, subjective norm and mobile payment knowledge, and factors which directly affect usefulness are mobility, convenience, compatibility, subjective norm and safe to use. Services providers should take practical action to meet those elements for the user.

The results show that among the external variables of the system, subjective norm has the most significant impact on both ease of use and usefulness. The influence of work colleagues, friends, and family as a critical determinant in an individual's decision-making process regarding the use of m-payment services (Keramati et al., 2012; Nguyen et al., 2016; Phonthanukitithaworn et al., 2016; Schierz et al., 2010;Shin, 2010; Yan et al., 2009; Yang et al., 2012). Moreover, the effect of subjective norm on ease to use and usefulness is likely to be stronger for students who have no experience because they rely heavily on other people's suggestions to help them make decisions (Phonthanukitithaworn et al., 2016).

In addition, mobile payment users with high-level knowledge did not find it difficult to use M-payment services, but instead they use it more effectively than those with low-level of knowledge. The results also indicated that both of perceived ease of use and perceived usefulness have significant impact on the behavioural intention to use M-payment. Between two variables, perceived usefulness was the greater predictor on behavioural intention to use mobile payment. Compared to traditional payment methods, new payment approaches trying to become popular must have higher usefulness, which is an indispensable requirement that payment service providers must meet for customers (Liu and Tai, 2016). However, more important concern is that it must be easy to use, because when customers use services easily, they can feel the usefulness of the service more easily; the outcome of ease to use positively affecting usefulness obviously proves this viewpoint (Nguyen et al., 2016).

TAM model previously proposed two belief variables including the perceived ease of use and the perceived usefulness to influence consumers' intention to apply new tools. This study proposes to add one more variable, which is safe to use, in the model. For a new service such as mobile payment service, besides these two previous important factors, the research results show that safe to use is also very important to the intention to use service by students' in Nigerian tertiary institutions. Although mobile payment service is easy to use and has high usefulness, but if it is not safe, the students will not accept it as an alternative service to the traditional payment methods.

Conclusively, mobile payment services have many advantages such as convenience, cost savings, and quick response, many limitations and risks may affects the intention to use of consumers. For this reason, the related service providers in Nigeria can conduct an appropriate allover strategy for the development of mobile payment services which is beneficial to the customers and themselves.

7. RECOMMENDATION

Based on the findings of this study, the following suggestions were recommended:

(i) Mobile payment service providers should consider safety as a crucial determinant toward students' intention of using mobile payment system.

(ii) Mobile payment service providers should prioritize their system by building a system that are trustworthy, easy to use, reliable and protect customer's privacy.

(iii) Mobile payment service providers should take cognizance of people's social connections, network and status when deployed their system in order to potentially increase the use of mobile payment services.

(iv) Mobile payment service providers should ensure that their services are aligned with customers" current values, needs and lifestyles.

(v) Government should provide enables environment for the smooth running of the mobile payment system.

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