Exploring Consumers' Intention to Adopt Mobile Payment Systems in Ghana

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ABSTRACT

In this paper, the authors examined consumers' intention to adopt and use mobile payment methods in Ghana. Data for the study was obtained from a sample of 260 respondents through online and direct survey using structured questionnaire. Structural equation modeling was used to analyse the data through SPSS v.22 and SmartPLS v.3. Findings with regards to the determinants of mobile payment system adoption indicate that perceived security, attitude, and perceived usefulness play active roles in consumer decisions to adopt mobile payment methods in Ghana. Also, perceived usefulness and perceived ease of use have a significant and positive influence on consumer's attitude towards mobile payment adoption. Further, subjective norm was found to influence perceived usefulness and perceived ease of use of mobile payment adoption in Ghana. The study contributes to the literature on mobile payment systems from a developing country context. The study proffered some recommendations.

KEYWORDS

Consumer Behaviour, Ghana, Mobile Payment, Structural Equation Modeling, Technology Acceptance, Theory of Planned Behavior

INTRODUCTION

Today, life has become dependent on electronic gadgets, which mainly consists of mobile devices such as the laptop, smartphone, and other electronic gadgets. In recent times, mobile phones enable us to engage in routine functions such as making payments for our shopping and other transactions (Sharma & Gupta, 2019). The introduction of the Information and Communication Technology (ICT), for instance, has created an opportunity for consumers to pay for products and services online and offline using mobile phones known as mobile payments or M-payment. Customers carry out large transactions through wireless and wired data transmission networks, with the support of mobile devices and mobile databases to give consumers access as well as convenience to large amounts of products and services.

According to Guo and Bouwman. (2016), M-payment is the initiation and confirmation of payment by wireless Some scholars also explained that M-payment could be defined as "any personal

or commercial activity involving an electronic device connected to a telecommunication network to complete an economic transaction" (Liébana-Cabanillas, Ramos de Luna, & Montoro-Ríos, 2017).

The introduction of technologies like CDMA (Code Division Multiple Access) supporting 3G/4G for mobile telecommunications by companies like MTN, VODAFONE, AIRTEL/TIGO, in Ghana has created an enabling platform for consumers and sellers to accept and use their mobile phones to pay or accept payment for goods and services in Ghana. Integrating payment systems developed in different parts of the world is a challenge due to the lack of ICT knowledge and limited bargaining power with intermediaries. Because of the low quality of existing means of payment in some developing countries, that open more significant windows of opportunity for the future use of mobile payment (Asongu & Nwachukwu, 2018).

Unlike the developed countries, Ghana and some other developing countries have still not developed a model that allows for the use of e-cards (debit or credit cards) for business transactions. So, consumers and businesses mostly rely on cash for payment methods and settling of debts. This situation is worrying as it poses and exposes consumers to some risk including health, theft and loss of valuable money as a result of carrying physical cash in a purse or wallet. There is the need, therefore, to consider other safer methods of carrying cash without subjecting consumers to the above dangers. One of such ways is the use of mobile payment method.

Mobile payments have been in existence in the developed economies for some time now and have been linked to improving business transaction. A recent study by Accenture shows that in the coming years, there would be a decrease in the traditional payment method in favour of an increased digital payment (Accenture.Consulting, 2015). The study further predicted a significant increase in the use of retail apps (8%), Apple Pay™/Samsung Pay™ (7%) and PayPal (6%) (Liébana-Cabanillas et al., 2017). Also, a study by eMarket indicates mobile payment transaction in 2016 reached $27.05 billion, with customers spending an average of $721.47 annually (eMarket, 2015). The reason for the sharp rise in mobile payment sales, according to the report, is due to the rapid growth of the use of mobile payment technology.

Notwithstanding the abundance of literature on M-payment in the developed economies, few empirical studies have been carried out on mobile payment usage in developing market (Muriu,2017).). As to whether consumers' aim towards e-payment can be construed to M-payment remains mostly unidentified. For that matter, the understanding of mobile users' intention to adopt M-payment system in developing economies such as Ghana appears to be sparse or non-existent. This study, therefore, seeks to breach the gap in the literature on M-payment studies in developing economies such as Ghana. Hence, the major objective of this study is to find out the determinants of mobile payments system adoption intentions among consumers in Ghana.

Theoretical Framework

M-Payment Adoption

E-payment or electronic payment is a form of payment which is generally defined as "a payer's transfer of a financial claim on a party acceptable to the recipient" (Antwi, Hamza, & Bavoh, 2015). It is a worldwide phenomenon that enables individuals to engage in online transactions globally anywhere and at any time (Kasemsap, 2016)), thereby enhancing both domestic and international trade (Hussain, Mollik, Johns, & Rahman, 2019) Lin and Nguyen (2001) defined e-payment as "payments initiated through the automated clearinghouse, commercial card systems and electronic exchanges".

Forrest (2011) defines M-payment as "a financial transaction started by a mobile phone without utilizing the voice function". Garntner (2012) also sees M-payment as "a transaction performed through mobile phone and payment mechanism that incorporate banking and telecommunication based on the telecom's billing system and interactive voice response system" (Garntner, 2012). In this paper, we define mobile payment as payment through communication technology that enables mobile users to make payment using mobile devices through SMS or internet services.

According to Dahlberg, Mallat, Ondrus, and Zmijewska (2008), M-payment is another method of e-payment which enables payment for goods and services through the Internet and communication technology (Dahlberg et al., 2008). Past studies have indicated that the increasing usage of mobile payment and related activities is due to the ubiquitous nature of the technology that transcends time and space (Carlsson, Walden, & Bouwman, 2006). As noted by Tinga, Yacobb, Liew, and Lau (2015), M-payment structure takes the opportunity of wireless and communication technologies which allows payments through platforms such as SMS message, WAP online billing, PIN transmission, Mobile Web, direct-to-subscriber bill and direct to credit cards transaction via mobile phones (Kim, Mirusmonov, & and Lee, 2010). Customers are, therefore making mobile payment the preferred payment method due to its effectiveness (Dewan & Chen, 2005).

Zhao and Kurnia (2014), mentioned that four methods to access M-payment are through "message or browser payment, application-based payment, contactless payment and hybrid payment" (Deloitte, 2012). The first two methods use what is referred to as remote payment, and the other two use what is termed as a proximity payment method (Zhao & Kurnia, 2014). From the objectives of a transaction, M-payment can be grouped under three modes, i.e. peer-to-peer payment, consumer-to-business payment and business-to-business payment (Deloitte, 2012). Also, from the provider's side, M-payment can be categorized into mobile network operator centric, financial institution centric and third-party operator centric (Lu, Yang, Chau, & Cao, 2011). These three operators, mobile network operator, financial operator and third-party operator, form a sort of network which provides the mobile payment transaction system. The mobile network provides the communication infrastructure through mobile and data service. The banking or financial service operators provide the remote or proximity payment by storing a client's bank card information on a mobile phone chip and using the mobile wireless communication technology and radio frequency technology (Zhao & Kurnia, 2014). On the other hand, the third-party platform utilizes an intermediary to provide the mobile payment services which integrate communication network from mobile network operators and payment accounts from the financial institutions (Lu et al., 2011).

Technology Adoption Factors

Factors influencing technology adoption and consumer intentions and Attitude in the context of traditional customers have been researched extensively in the literature. Both empirical and theoretical review shows that the theories of Reasoned Action (TRA) (Ajzen & Fishbein, 2005), Technology Acceptance Model (TAM) (Davis, 1989) and Theory of Planned Behaviour (TPB) (Ajzen, 1991) are among the most popular theories used to explain online shopping behaviour (Limayem, Hirt, & Cheung, 2007). For the purpose of this research work, we adopted the technology acceptance model (TAM) and the theory of reasoned action (TRA) as the main theoretical anchor for this study.

The TRA has been used extensively as a significant determinant of consumer actions or behavior, both online and offline. The TRA, as proposed by Ajzen and Fishbein (2005), emphasizes that an individual's behaviour is as a result of Attitude that is formed by perceptions or norms. It further explains that intentions are the outcome of attitudes and social aspects or subjective norms (Dennis, Merrilees, Jayawardhena, & Wright, 2009). The TRA model argues, for example, that, decision to perform an action, in this case, to use the mobile payment for transactions can be influenced by friends and associates. Shim, Eastlick, Lotz, and Warrington (2001) assert that social influences are very significant for e-shopping, but e-retailers have challenges in satisfying this need. Rohm and Swaminathan (2004) found that social interaction was a significant motivator for e-shopping. Parsons (2002) concurred by concluding that social influence from outside home and peer groups influence consumer behavioral intentions.

The technology acceptance model, on the other hand, by has been widely adopted in many fields to examine technology adoption (Dennis, 2005). The TAM claims that Attitude of customers towards the use of new technology is influenced by the perceived effectiveness, usefulness and ease of use of the technology (Davis, 1989). The TAM is said to have been derived from the TRA (Dennis, Newman,

Brakus, & Wright, 2010). The usefulness of technology relates to consumer's opinion that the use of the said technology will enhance their shopping and information seeking outcome (Chen, Gillenson, & Sherrell, 2002). Usefulness is also seen in the image components of product selection, customer service and delivery or fulfilment in the role of functional attributes of the product (Dennis et al., 2009). Ease of use, on the other hand, relates to the degree to which the said technology is seen to involve exerting minimum energy in carrying out the task of using the technology (Chen et al., 2002).

MATERIALS AND HYPOTHESES

Subjective Norm

Social influences according to Liébana-Cabanillas et al., (2017) and Venkatesh & Bala, (2008) are in the form of subjective norms and are used as factors both in models of technology acceptance and in their usage (Liébana-Cabanillas et al., 2017; Venkatesh & Bala, 2008). It is defined as the degree to which an individual sees his or her action been influenced by other people close to him or her. Thus, how an individual perceives the opinion of people close to him when considering to perform certain action (Venkatesh & Bala, 2008). There are two main underlying sets of factors involved in this. First, the beliefs the consumer has in the person's he sees as his reference point when considering an action; and second, the desire to act in accordance to how his references behave (Herrero, García, & Rodríguez del Bosque, 2005). From this, some scholars have identified a direct and positive relationship between "*subjective norms* and *ease of use*" (López-Nicolás, Molina-Castillo, & Bouwman, 2008), "*usefulness*" (Zhang, Yue, & Kong, 2011) and, "*intention to use*" (Shin, 2009). Based on the above assertion, we propose the following hypotheses:

Hypothesis 1: Subjective norm would have a positive and direct influence on of ease of use of mobile payment method.
Hypothesis 2: Subjective norm would have a positive and direct influence on the usefulness of the mobile payment method.

Perceived Usefulness

Many research works in recent time have demonstrated that perceived usefulness has a significant direct relationship with mobile payment adoption (Amoroso & Magnier-Watanabe, 2012; Kim et al., 2010; Liébana-Cabanillas et al., 2017; Meharia, 2012; Zhao & Kurnia, 2014). The influence of perceived usefulness on the intention to adopt a particular technology has been researched extensively. Wong and Hiew (2005) in their study revealed that mobile commerce transaction is influenced significantly by the perception of the usefulness of the mobile devices such as "personalization, ubiquity, localization, timeliness and network stability". Also, Teoh, Chong, and Chua (2013) found that the perceived usefulness largely determined consumers' intention to use mobile commerce in Malaysia (Mun, Khalid, & Nadarajaha, 2017). Thus, consumers would adopt M-payment if they consider it to be a more efficient payment method to achieve their desired outcomes. We, therefore, propose the following hypotheses:

Hypothesis 3: Perceived usefulness would influence consumer's Attitude towards the intention to use the mobile payment method.

Ease of Use

The ease of use refers to an individual's perception that "using a particular system will be effortless or, simply, easy to handle" (Davis, 1989). This is considered as one of the most influential

determinants of new technology adoption. User may find, for instance, the use of a particular technology tedious and complex due to the nature of the technology, including its features which might be difficult to navigate through. As such, the mobile payment service platform should be easy to use by consumers. Many research works have been carried out in different context to explore the effect of the perceived ease of use on perceived usefulness of a product (Hernández, 2010; Liébana-Cabanillas, Muñoz-Leiva, Ibáñez-Zapata, & Rey-Pino, 2012; Mun et al., 2017). For Davis, Bagozzi, and Warshaw (1989), the ease of use dimension of adoption has a double impact. First, it's perceived influence on Attitude, and second, it's utility as shown by the TAM. We, therefore, propose the following hypotheses:

Hypothesis 4: The perceived ease of use would influence the perceived usefulness in the adoption of mobile payment method.
Hypothesis 5: The perceived ease of use would influence Attitude towards the intention of mobile payment method.

Attitude

Empirical findings on technology adoption have expanded the use of the TAM to include Attitude (Davis, 1989). Some studies have shown that beliefs and attitudes predict intentions (Tinga et al., 2015; Wang, Sun, Lei, & Toncar, 2009). Behavioural intention is sometimes understood in the context of how Attitude influences actual behaviour (Huang, Lee, & Ho, 2004), and how intention and behaviour would be negatively influenced by negative Attitude (Stevenson, Bruner, & Kumar, 2000). According to Polatoglu and Ekin (2000), explain that decision to adopt a product by consumers is influenced partly by their Attitude towards the product, i.e. their convictions about the importance and perceived usefulness of the product (Liébana-Cabanillas et al., 2017). As a result, it is expected that consumers' Attitude would facilitate transactions and reduce the obstacles to adoption of the terms of trade (Pavlou, 2002a, 2002b), and more specifically, the intention to use mobile payment systems (Schierz, Schilke, & Wirtz, 2010). In this study, Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) is adopted to determine whether or not the Attitude of consumers toward mobile payment influences their intent to adopt mobile payment method. We, therefore, hypothesize thus:

Hypothesis 6: Attitude is an antecedent of intention to use the mobile payment method.

Perceived Security

Mobile devices, despite their importance in recent times, have come under severe threat in recent times. As noted by Jain and Gupta (2019), mobile devices are prone to new attacks like smishing which is a security attack performed by sending fake messages to steal personal credentials of mobile users. Ashrafi & Ng, (2008) are of the view that security and the perception of risk are the major factors that inhibit perceived intention to adopt electronic payment systems. When consumers perceive any concern about the security of a platform or technology, it makes it hard for them to want to use it. Consumers can only consider mobile payment service as secure when they are satisfied with the level of transactions done in a secured manner. Wan and Che (2004) assert that perceived security exerts a significant influence on consumers acceptance of technology (Mun et al., 2017). Thus, it is essential to enhance the security features of electronic payment systems, especially new systems, to generate consumer confidence in trying these new services and systems. We hypothesize thus:

Hypothesis 7: Perceived security would influence consumers' intention to adopt mobile payment method.

Figure 1. Conceptual model and hypotheses of the study
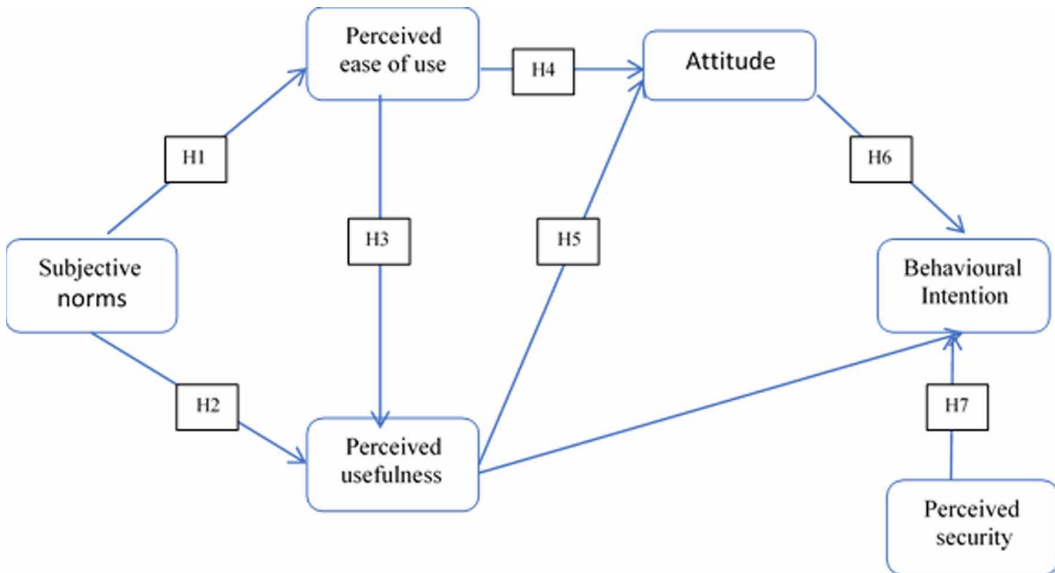
Methodology

This study was undertaken to establish the determinants of consumers' intention to adopt and use mobile payment method as a payment option for goods and services in Ghana. A convenient sampling method was used to select respondents from Kumasi, Ghana's largest city in terms of population and business presence. Three hundred (300) respondents were sampled for this study; however, 260 responses were found to be useable after the initial screening and data cleaning. The adoption of the convenience sampling technique for the data collection was as a result of the difficulty in estimating the sample size as well as identifying the population of the study. A self-administered, structured questionnaire was developed, pre-tested and finally administered to the respondents through personal contact by researchers. The researchers used informed consent form to seek for the permission of respondents and assured them of anonymity and confidentiality of their responses.

A Likert scale which ranged from 1 = "strongly disagree to 5 = strongly agree" was used. The questions were adapted from similar studies. The questionnaire was designed in three (3) different parts. The first part (section A) measured the demographic characteristics of the respondents; Part I (section B) and Part III (section C) measured the main variables, i.e. the independent variables (subjective norm, perceived ease of use, perceived usefulness, Attitude and perceived security) and dependent variable (behavioural intention).

The questionnaire consisted of closed-ended questions for the constructs, five-point Likert scales, and socio-demographic data. Scales for the study were adapted from Venkatesh and Davis (2000), Mun et al. (2017) and Liébana-Cabanillas et al. (2017) to measure subjective norms about mobile payment systems. The Attitude to use scale was adapted from research conducted by Schierz et al. (2010) and Liébana-Cabanillas et al. (2017). The usefulness scale was adapted from the work of Bhattacherjee (2001), Mun et al. (2017) and Liébana-Cabanillas et al. (2017). The perceived ease of use scale was adapted from Davis et al. (1989), Venkatesh and Davis (2000) and Liébana-Cabanillas et al. (2017). The perceived security scale was adapted Liébana-Cabanillas et al. (2017) and Zhao and Kurnia (2014). Finally, the intention to use scale was adapted from Davis (1989), Venkatesh and Davis (2000), Liébana-Cabanillas et al. (2017) and Mun et al. (2017).

The collected data was analyzed using the Statistical Package for Social Sciences (SPSS v,22) and SmartPLS 3. The data was first coded and screened for outliers or any other variation in the data set. Descriptive analysis was used for the demographic variables and the hypotheses tested using structural equation modelling (SEM). Data validation was done through content and construct validations. Confirmatory factor analysis was also used to purify the measures, assess the unidimensionality of the scale items and assess discriminant validity among the constructs (see Table 2).

RESULTS AND DISCUSSIONS

Demographic Characteristics of Respondents

Some demographic variables were collected in this study: gender, age, level of education, type of accounts and average income per year, and these results are summarized in Table 1. In terms of gender, 60.8% of the respondents were males, and 39.2% were females. With regards to age, 26.2% of the respondents were between 18 and 24 years; 32.3% were between 25 and 29 years; 19.2% were between the ages of 30 and 34; 13.5% were between 35 and 39 years, and 8.5% were 40 years and above. In terms of education, about 53.9% of them had undergraduate degrees; 25% had a Masters' degree; 4.6% PhD degree; 10.8% had basic level education, and 5.8% had other qualification. With regards to the employment status of the respondents, 46.2% are employed; 13.8% are self-employed; 5.4% are unemployed, and 34.6% are students. About 25% of the respondents earned a monthly income below GHC 500; 34.6% of the respondents earned monthly income between GHC 400 to 1000; 30% earn monthly income between GHC 1000 and 5000, and 10.9% earn monthly income above GHC 5000. Regarding the payment option frequently used by respondents, about 50% indicated they use cash; 10.4% use cards (debit/credit cards); 10.8% indicated they use cheque; about 23% indicated mobile money, and 5.8% indicated they use electronic payments. On the preferred payment method, 32.2% indicated cash; 10.4% indicated cards; 5% indicated cheque, and 36.2% indicated mobile money and 16.2% indicated electronic payments (see table 1).

Measurement Model Reliability and Validity

The confirmatory factor analysis is used to test the model's fitness with the data. The measurement model consisted of the latent constructs Subjective Norm, Perceived Ease of Use, Perceived Usefulness, Perceived Security, Attitude and Intention to use.

Construct reliability measures the extent of the internal consistency of the measures used, and it was assessed through the item factor loadings with the acceptable value of 0.70 and through Cronbach's alpha with the acceptable level of 0.7 (Hair, Ringle, & Sarstedt, 2011; Ringle, Wende, & Becker, 2015). From Table 2, all of the constructs have item loadings higher than the recommended 0.70.

All the variables returned Cronbach alphas above 0.70, indicating that these multiple measures are highly reliable for the measurement of each construct (see Table 2). Construct validity "assesses the degree to which a measurement represents and logically connects the observed phenomenon to the construct through the fundamental theory" (Fornell & Larcker, 1981a). It is also assessed through convergent validity and discriminant validity (Ringle et al., 2015). Convergent validity was considered adequate since the average variance extracted (AVEs) and composite reliability (CR) satisfied the minimum of 0.50 and 0.70 respectively (Fornell & Larcker, 1981b; Ringle et al., 2015).

Discriminant analysis requires a factor to correlate higher than with any other construct on its scale (Messick, 1988). From table 3, it is clear that all the factors loaded higher than any other factor on their scales. Innovativeness on its scale had a value of about 0.9, which is higher than any other construct on that scale. ATTD has a value of (0.8), BI (0.8), PEOU (0.8), PSEC (0.8), PU (0.8) and SN (0.8).

Table 1. Demographics of respondents (N=260)

Variables	Category	Frequency (%)
Gender	Male	158 (60.8)
	Female	102 (39.2)
Age (years)	18 - 24	68 (26.2)
	25 – 29	85 (32.3)
	30 – 34	50 (19.2)
	35 - 39	35 (13.5)
	40 +	22 (8.5)
Level of education	Basic level	28 (10.8)
	Undergrad	140 (53.9)
	Master's level	65 (25)
	PhD degree	12 (4.6)
	Other	15 (5.8)
Employment status	Employed	120 (46.2)
	Self-employed	36 (13.8)
	Unemployed	14 (5.4)
	Student	90 (34.6)
Average spending (monthly)	GHC 0 - 400	65 (25)
	GHC 400 – 1000	90 (34.6)
	GHC 1000 – 5000	78 (30)
	GHC 5000 and above	27 (10.9)
Payment option used (frequently)	Cash	130 (50)
	Cards (Debit/Credit cards)	27 (10.4)
	Cheque	28 (10.8)
	Mobile money	60 (23)
	Electronic payment	15 (5.8)
Preferred payment option	Cash	84 (32.2)
	Cards (Debit/Credit cards)	27 (10.4)
	Cheque	13 (5)
	Mobile money	94 (36.2)
	Electronic payment	42 (16.2)

Note: 1 GHC = $0.0.17 USD (Currency exchanger, 21/10/2020)

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Results of the Structural Model

The structural model was assessed through the regression weights, t-values and the p-values for the significance of t-statistics (Chin, 2010; Ringle et al., 2015). The results of the structural model for testing the research hypotheses are presented in Table 4.

A test of the hypothesis was carried out using the bootstrapping method with 5000 samples to assess consumers' behavioural intention to adopt mobile payment in Ghana. In the first model, we tested the effect of subjective norm on perceived ease of use and perceived usefulness of mobile payment adoption. Subjective norm had a significant and positive effect on both variables; PEOU ($\beta = 0.173$; t= 2.16; p < 0.032) and PU ($\beta = 0.298$; t= 3.78; p < 0.000) and this led to the acceptance of H1 and H2 respectively. This means that SN has a greater effect on perceived usefulness than on perceived ease of use of mobile payment adoption by consumers. Also, when subjective norm increases by 1%, perceived usefulness and perceived ease of use mobile payment by consumers increase by 29.8% and 17.3% respectively. Thus, a consumer's intention to adopt mobile payment system is influenced

Table 2. Item loading and construct reliability

	FL	VIF	CA	CR	AVE
ATT1	0.814	0.778	0.781	0.871	0.693
ATT2	0.846				
ATT3	0.836				
PEOU1	0.808	0.813	0.815	0.877	0.640
PEOU2	0.789				
PEOU3	0.780				
PEOU4	0.824				
PS1	0.890	0.798	0.886	0.870	0.692
PS2	0.766				
PS3	0.834				
PU1	0.829	0.872	0.873	0.913	0.723
PU2	0.864				
PU3	0.850				
PU4	0.858				
SN1	0.868	0.817	0.825	0.891	0.731
SN2	0.852				
SN3	0.845				
BI1	0.835	0.762	0.772	0.862	0.676
BI2	0.806				
Bi3	0.825				

Notes: FL – Item Loadings, ATT – Attitude, SN – Subjective Norm, PEOU – Perceived Ease of Use, PU – Perceived Usefulness, PS – Perceived Security, BI – Behavioral Intention; AVE-Average variance extracted, CR- Composite reliability, CA – Cronbach's alpha

Table 3. Discriminant Validity

	ATTD	BI	PEOU	PSEC	PU	SN
ATTD	0.830					
BI	0.019	0.817				
PEOU	0.463	-0.039	0.779			
PSEC	0.332	-0.108	0.291	0.814		
PU	0.551	-0.059	0.538	0.414	0.831	
SN	-0.018	0.687	-0.092	-0.130	-0.088	0.830

indirectly by the perception of other people about the mobile payment system. The influence of social norms on m-payment adoption in the Ghanaian context might be due to the extended family system that exists in Ghana. This finding is instructive in the sense that, consumers form their decision to either adopt or not to adopt a particular technology; in this case mobile payment method based on the judgment of what their social circle thinks about the product. This supports the assertion by some researchers that consumers' intention to adopt a particular technology is dependent on two factors, i.e. the belief and trust the consumer has for his or her reference, and second, the desire to imitate what his references do in terms of action taken towards a product (Herrero et al., 2005). This finding however, contradicts that of Shankar and Datta (2018) where subjective norms (SN) and personal innovativeness (PI) were found to have no significant impact on m-payment adoption intention in India.

Again, in the second model, the study assessed the effect of perceived usefulness on attitude and consumer behavioural intention of mobile banking adoption. Perceived usefulness had a significant and positive effect on Attitude and BI ($p < 0.001$). Perceived usefulness had a positive and significant

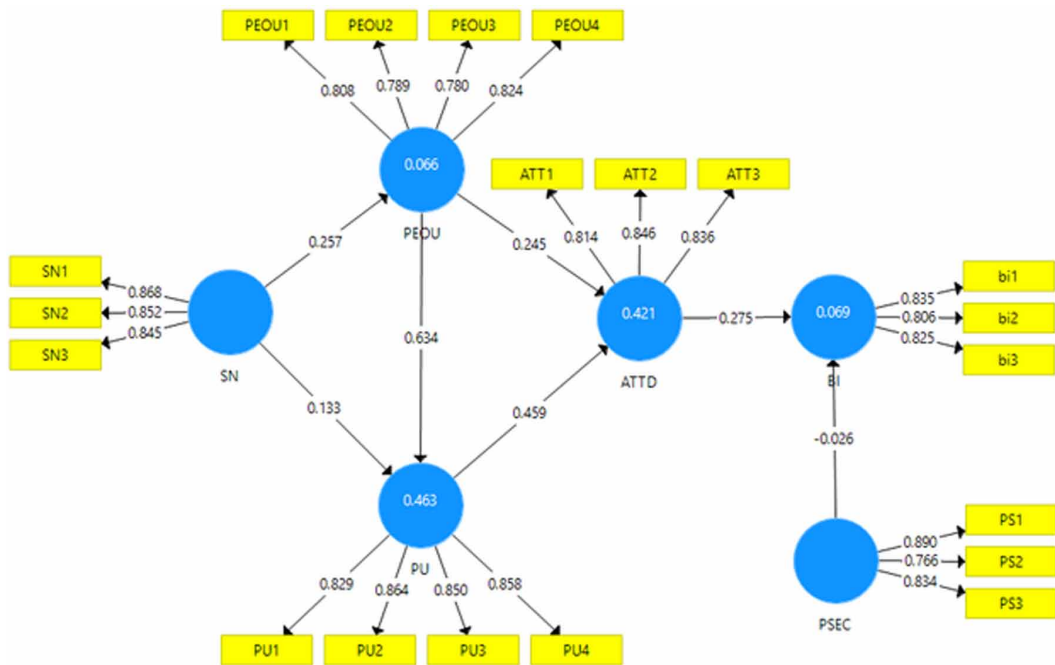**Figure 2. Results of structural modelling on M-Payment adoption**

Table 4. Results of hypotheses test

Paths	Beta	SD	t-value	p-value
ATTD -> BI	0.275	0.066	4.132	0.000
PEOU -> ATTD	0.245	0.056	4.407	0.000
PEOU -> PU	0.634	0.038	16.623	0.000
PSEC -> BI	-0.026	0.073	0.352	0.725
PU -> ATTD	0.459	0.062	7.437	0.000
SN -> PEOU	0.257	0.064	4.016	0.000
SN -> PU	0.133	0.039	3.422	0.001

effect on Attitude ($\beta = 0.438$; t= 6.08; $p < 0.000$) and this led to the acceptance of H3. Also, perceived usefulness had a positive and significant effect on BI ($\beta = 0.122$; t= 2.03; $p < 0.044$), and this led to the acceptance of H4. The Beta scores mean that, when PU increases by 1%, Attitude towards mobile payment adoption increases by 43.8%. Also, when PU increases by 1%, consumer behavioural intention towards mobile payment adoption increases by 12.2%. This finding also shows the importance of perceived usefulness in product decision making. It means that consumers' intention to adopt mobile payment method as a payment option is influenced by how useful the service is to the consumers in achieving a desired result or outcome. That is, the consumer would derive some benefits in using the new technology as compared to using the traditional method of payment. This supports what Wong and Hiew (2005) found that the perception of the usefulness of the mobile devices such as personalization, ubiquity, localization, timeliness and network stability greatly influence the adoption of mobile commerce.

Figure 3. Bootstrapping the hypotheses for M-Payment adoption
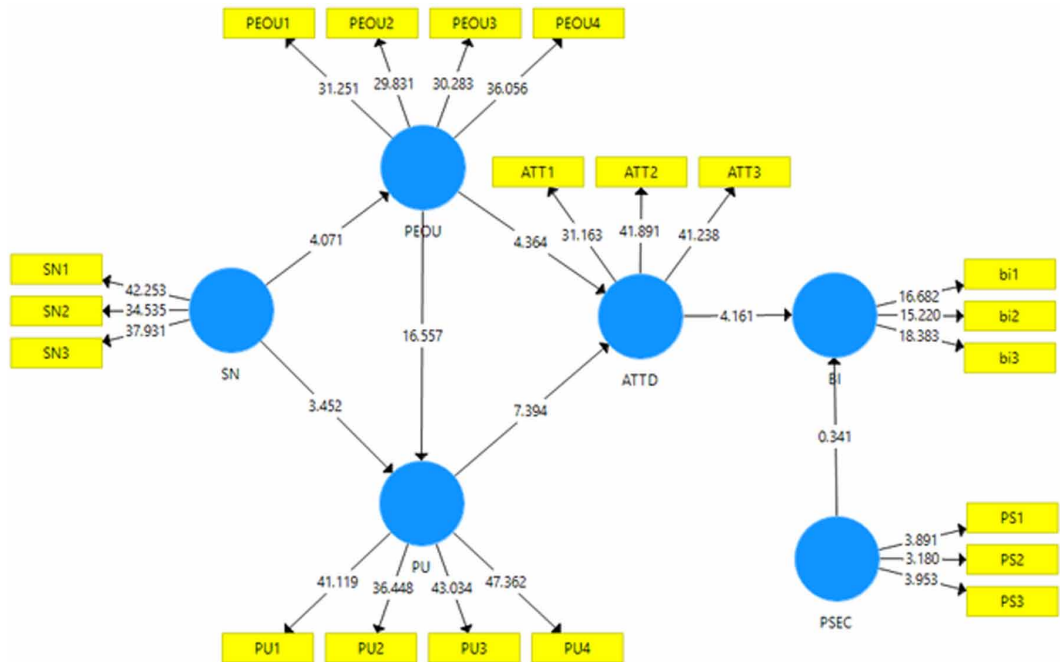
In the third model, the effect of PEOU on Attitude and perceived usefulness was also assessed. PEOU had a significant and positive effect on Attitude and PU ($p < 0.001$). Perceived ease of use had a positive and significant effect on Attitude ($\beta = 0.167$; t= 2.29; $p < 0.024$), and this led to the acceptance of H5. Also, PEOU had a positive and significant effect on PU ($\beta = 0.584$; t= 8.42; $p < 0.000$), and this led to the acceptance of H6. The Beta scores mean that, when PEOU increases by 1%, perceived usefulness of mobile banking adoption increases by 58%. Consumers thus would adopt mobile payment method if they perceive the system as very easy to navigate. Perceived ease of use is thus regarded as one of the most important determinants of new technology adoption. The platform should, therefore, be designed in a way that consumers would find it easy and comfortable to use. Once consumers find the new technology easy to use and also realize the benefits as mentioned above, consumers would have no problem in switching from the traditional mode of payments method to mobile payment option.

Finally, in the fourth model, an assessment of the effect of perceived security and Attitude on consumers' behavioural intention towards mobile payment adoption was also carried out. The two variables, perceived security and Attitude, had a significant and positive effect on behavioural intention ($p < 0.001$). Attitude had a positive and significant effect on BI ($\beta = 0.227$; t= 3.28; $p < 0.001$); this also led to the acceptance of H7. Also, perceived security had a positive and significant effect on BI ($\beta = 0.158$; t= 5.04; $p < 0.000$), and this led to the acceptance of H8. The Beta scores mean that, when Attitude increases by 1%, consumer intention towards mobile payment adoption increases by 22.7%. Again, when perceived security increases by 1%, consumer intention towards mobile payment adoption increases by 15.8%. This finding shows that perceived security had more influence on consumer intention to adopt mobile payment method than perceived usefulness and Attitude. This is because the issue of perceived security is one of the important factors that influence new technology adoption. Failure to convince consumers about how safe and secured their transaction would have a negative effect on the drive to get consumers to adopt mobile payment system. As Ashrafi & Ng (2008) noted, the issue of perceived security and the perception of risk are the major factors that deter

people from wanting to engage in or adopt electronic payment systems. Thus, consumers consider the security of the new technology foremost before any other reason to arrive at a decision to adopt or not to adopt new technologies.

CONCLUSION AND IMPLICATIONS

This study focused on the determinants of consumers' adoption of mobile payment adoption from Ghana. Findings with regards to the determinants of mobile payment system adoption indicate that Attitude, perceived security and perceived usefulness play active roles in consumers decision to adopt new technology. Business owners and marketers, therefore, can grow their business further by promoting the use of M-payment to complement cash payment and payments options already in existence. They can also enhance the service quality by ensuring that the transaction is carried out successfully, ensuring that the process is easy and also expanding the accessibility and availability of the service.

This finding also revealed that perceived usefulness influences consumers' attitude towards mobile payment adoption more than perceived ease of use. This could be important to businesses that want to adopt mobile payment systems to focus their communication more on the benefits of adoption of the new payment method to consumers which includes ease of payment, convenience and security.

Recommendations

This study proffers some recommendations to businesses and marketers interested in adopting mobile payment systems, especially in developing countries. First and foremost, business owners must find a way of encouraging consumers to accept mobile payment as a payment option by adjusting their habit of a mode of payment from cash or cards to paying through mobile phones.

Secondly, one of the findings in this study indicates that consumers place much emphasis on the issue of security. Perceived security is an essential factor in the acceptance of new technologies by consumers. Due to this perception, businesses and all other agents involved in the implementation of mobile payment systems must see to the implementation of adequate security measures to win consumer trust in the system and increase the chances of adoption and use of mobile payment system as a payment method.

Additionally, government, businesses, and organizations should encourage the acceptance and use of the m-payment system to complement existing payment methods and augment consumers' payment behaviour. Moreover, managers and marketers must recognize the implication of cultural values on intention towards M-payment system adoption.

Contribution

This research offers a modest contribution to industry and research related to M-payment adoption. First, it allows researchers and practitioners to explore the enthusiastic response of consumers about mobile payment services, especially from developing country context where this payment option is still in its infancy stage. With regards to the industry players, the results of the study can help potentially them to better understand consumers' expectations and factors that affect their decision to use M-payment. As a result, mobile service providers can offer better and improve strategies for implementing and promoting M-payment systems.

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