Innovating E-Payment System to Boost Marketing of Entrepreneurial Products: Case of Pan-African Payment and Settlement System (PAPSS)

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| Article Info:	Abstract
	Technological advancements are impacting e-payment innovations. The effort directed towards the innovation of e-payment system in Nigeria to boost marketing of entrepreneurial product is a promising move that has potential to impact Nigeria's business landscape. The purpose of the study is to investigate the determinants of entrepreneurs' intention to use pan-African payment and settlement system (PAPSS) for e-commerce cross-border payments. PAPSS is a novel sub-Saharan African cross-border payment innovation for cross-border trade. Cross-sectional design was adopted in the study. 182 samples were pooled from entrepreneurs using self-administered questionnaire that was adapted from related studies and validated using confirmatory factor analysis. Structural equation modeling was adopted in data analysis. Entrepreneurs consider trust, attitude, and relative advantage to have direct influence in adopting the innovation despite the weak nature of relationship. The result highlights entrepreneurs' interest on improved performance thereby providing developers with insight on areas of improvements to encourage mass adoption. **Keywords:** *E-payment, PAPSS, entrepreneur, SME, user behaviour, E-marketing, IT adoption, Innovation*

1- Introduction

The context of marketing to an entrepreneur is an important aspect to the success of entrepreneurial ventures. Entrepreneurs and micro, small and medium scale enterprises (MSME) can rely on interactive marketing means to relate with customers. In contemporary times, customers have become sophisticated given the arrays of information technologies thereby making it more challenging in handling and reaching them compared with the primordial times (Nwosu & Oloveze, 2019). The developments in information and communication technology (ICT) have enhanced the business applications, and improved the opportunities for growth in profitability, productivity and overall performance for organisations (Liebana-Cabanillas et al., 2014a). The vital roles of ICTs in business have also transformed the payment sector for the entrepreneur and MSMEs. The developments occasioned by ICT in payment systems have heralded improvements in better handling of transactions and payments issues between businesses and customers (Liebana-Cabanillas et al., 2014a). In Nigeria, it is a response to the demands of entrepreneurs for smooth operations in payments for products given the roll out of cashless policy by the apex bank in 2011. Some of these improvements are in fast payments, convenience, safety, simplification of the payments, enablement of businesses and payments to be executed anytime and anywhere.

Few years ago, MSMEs demanded for better e-payment systems that deliver instant value (Thisday, 2023a). The demand for instant payments by users created demand for better e-payment systems and a shift in user adoption (Nairametrics, 2023). A variety of e-payment options that entrepreneurs use in Nigeria are retail payment systems for small transactions (automated teller machine (ATM), automated clearing house (ACH), point of sale (PoS) terminals, internet payments, mobile payments, and wire transfers) and wholesale payment systems (Real time gross settlement system (RTGS) for real time payment settlements, and society for worldwide inter-bank financial telecommunication (SWIFT) for international payments) (CBN, 2021). The adoption rate increased by 40% from 2021 (Ojukwu, 2022) and continued to rise during Nigeria's naira crisis despite the glitches in e-payment transactions (Jaiyeola, 2023a). The growth was enabled by more involvements of start-ups in improving real-time payment (Dada & Oluwadara, 2023) and advancements in internet-based technology. Recently, it has led to simplification of payments and improvements in financial inclusion (Thisday, 2023a). Notably, some of these e-payment solutions

available to MSMEs are for local payment transactions while some others such as Bank transfers, Paypal, and SWIFT permits international payments for cross-border commerce.

The concept of Pan-African Payment and Settlement System (PAPSS) is an emerging discourse in Africa. Payments in Africa are majorly through real time gross settlement systems (RTGS) transfers (Interledger Foundation, 2021). However, PAPSS as a brainchild of African Export-Import Bank (Afreximbank) and African Continental Free Trade Agreement (AfCFTA) is driven towards bridging payment challenges in Africa's cross-border trade (Aro, 2022). It is a centralised payment settlement designed to promote payments in local currencies for all business transactions carried out beyond the borders of an African country. As detailed in figure1, it is in line with emerging real-time or instant payments that is rapidly becoming the new trend (Nairametrics, 2023). The payment system is deemed helpful because of the highly fragmented nature of Africa's payment system (Interledger Foundation, 2021). It supports wholesale and retail real-time payments through a participating bank or payment service provider (PSP) but requires the user to sign-up to the system (KPMG, 2021). The benefit of PAPSS is low cost to businesses, safety and instant flow of funds (Aro, 2022), payments and receipts in local currencies, time savings, and removal of intra-trade bottlenecks (KPMG, 2021). It works by ensuring the participant (participating bank or PSP) signs up to PAPSS, prefunds the settlement accounts in CBN and PAPSS, and process payment through PAPSS for an importer who issues payment instruction through it (KPMG, 2021). The issue of exchange rates is resolved through PAPSS as it is available to PIP or participating bank who communicates instantly to the importer. However, the process of PAPSS implies that payments and receipts occur in local currency between the importer and exporter almost instantly once the PIP acts on importer's payment instruction (KPMG, 2021). The process occur almost instantly (KPMG, 2021) rather than the old processes that takes 3-5 days to be executed (Interledger Foundation, 2021). Presently, Nigeria, Gambia, Liberia, Guinea, and Ghana are the countries where PAPSS have been successfully piloted while further rollouts are planned in Zimbabwe, Zambia, and Djibouti before the end of 2023 (Thisday, 2023b).
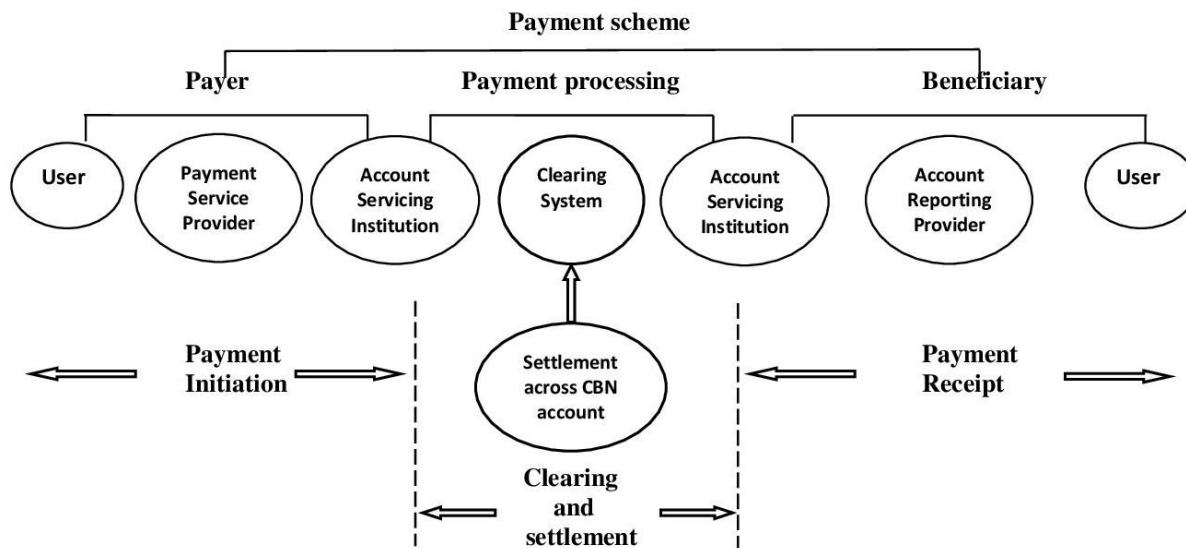
Figure 1: Payment process
Source: Nairametrics (2023) Nigeria payments system, vision 2025

1.1 Statement of the problem

One of the major problems identified in the study is the poor adoption level of e-payment systems by MSMEs which has been documented by the Global Findex Report (2018). The report asserts the source to emanate from MSMEs resort to cash payments. Additionally, there is rising fraud cases which have threatened the patronage of e-payment channels (Jaiyeloa, 2023b) while e-payment channel and fintech failures that contributed to failed transactions have created e-payment system instability and rising customer complaints. Notwithstanding, studies have focused on the individual consumer dimension (Oyelami et al., 2020) while there is less focus on the supply side and industrial consumer dimension. These are critical issues contending against adoption of innovation. This is significant when innovation like PAPSS is considered.

1.2 Objectives of the study.

1   The main aim of the study is to determine the factors that influence entrepreneur's intention to adopt PAPSS. The specific objectives include:
2   1. To ascertain the effect of perceived relative advantage on ease of use of PAPSS
3   2. To determine how perceived relative advantage is related to intention to use PAPSS
4   3. To identify the influence of perceived compatibility on ease of use of PAPSS

5   4. To discover the influence of perceived compatibility on perceived usefulness of PAPSS

6   5. To ascertain how ease of use influences firm's attitude to the use of PAPSS

7   6. To determine the effect of ease of use on perceived usefulness

8   7. To identify the relationship between perceived usefulness and firm's attitude to the use of
PAPSS

9   8. To evaluate how perceived usefulness is related to intention to use PAPSS

10 9. To discover the effect of firm's attitude to the use on intention to use PAPSS

11 10. To ascertain the effect of perceived trust on intention to use PAPSS

12 11. To determine the influence of perceived trust on firm's attitude to the use of PAPSS

13 12. To discover the effect of perceived risk on intention to use PAPSS

1.3. Research Questions

1. What is the effect of perceived relative advantage on ease of use of PAPSS?

2. How does perceived relative advantage relate to intention to use PAPSS?

3. What is the influence of perceived compatibility on ease of use of PAPSS?

4. To what extent does perceived compatibility influence perceived usefulness of PAPSS?

5. What is the influence of ease of use to firm's attitude to the use of PAPSS?

6. How does ease of use influence perceived usefulness?

7. What is the relationship between perceived usefulness and firm's attitude to the use of PAPSS?

8. What is the effect of perceived usefulness on intention to use PAPSS?

9. What is the effect of firm's attitude to the use on intention to use PAPSS?

10. To what extent does perceived trust influence intention to use PAPSS?

11. What is the effect of perceived trust on firm's attitude to the use of PAPSS?

12. How does perceived risk influence intention to use PAPSS?

2 Literature review and hypotheses

2.1 E-payment systems in Nigeria

The volume and value of Nigeria's e-payment transactions have continued to rise. As at 2022 Nigeria's transaction through e-payment systems hit N38.9 trillion (Nigeria Inter-Bank Settlement Systems, 2022). They are classified majorly by online transfers, automated teller machine (ATM) transactions, MMOs, point of sale (PoS) transactions, unstructured supplementary service data

(USSD) transfers, Mobile app transfers (not mobile money), National electronic fund transfer (NEFT), RTGS transfers, and direct debts with online transfers accounting for largest percentage of e-payments (Statista Research Department, 2022). The different options suggest increased adoption (Igudia, 2018). This is not dissimilar to extensive usage in developed and emerging economies given its benefits of convenience, reduction in cash handling and transitioning to modern market economy. A number of these benefits have influenced increased introduction of e-payment systems though cash has predominant place in the country (Afaha, 2019). The benefits that promote increased adoption are indicating futuristic unbundling effect on nationally confined markets (Igudia, 2018). E-payment systems such as PAPSS are indicative of this benefit given the support for cross-border payments in local currencies and removal of time constraints in payment settlement (Aro, 2022). The central bank of Nigeria enacted e-payment policy to align Nigeria's e-payment system with best practices (Dada & Oluwadara, 2023). The payment system vision (PSV) 2020 created deeper impact by encouraging greater widespread use of e-payment options, accommodating the global trends in e-payment ecosystem, and making the systems internationally and locally recognised (Nairametrics, 2023). The effect of the regulatory policies have enhanced the robustness of e-payment system, deepened confidence and trust, and enhanced transaction timeliness (Thisday, 2023). Studies indicate existence of positive effect of the policies with deepening consumer confidence (Nairametrics, 2023) and consumer spending (Oyelami et al., 2020). However, PwC (2020) argued that payment policies had about 33% severe effect on timeliness of payments, and a poor three years growth record. Similarly, studies related to e-payment show that perceived benefits, competitive pressures, and high bank charges are some of the factors that influence adoption of e-payment systems by MSMEs (Igudia, 2017).

2.2 Adoption of e-payment systems

The adoption of e-payment systems in Nigeria is rapidly increasing. In the past, there was poor adoption among MSMEs despite the consistent improvements in adoption generally (Igudia, 2018). Extant studies on e-payment systems have identified different factors that influence SMEs' adoption. Igudia (2017) examined e-payment systems adoption by SMEs using a qualitative survey approach; and established trust, security, bank charges, benefits and infrastructure as the dominant factors affecting adoption. Moncada et al., (2022) applied mean analysis in their study and

identified relative advantage, compatibility, security, observability, and behavioural intention in adapting e-payment systems with complexity having a stronger effect. Yawised and Apasrawirote (2021) based their study on technology acceptance model (TAM) but analysed their data using multiple regression technique. Their findings confirm ease of use as the strongest determinant of SMEs adoption of e-payment systems while perceived usefulness had no significant effect. In the study of e-payment adoption and consumer spending growth by Oyelami et al., (2020), trust, convenience, social influence, and security and safety were the key determinants among the users. Igudia (2018) proposed a model in conducting a qualitative evaluation of determinant factors influencing SMEs' adoption of e-payment in Nigeria. The model involved technology context, organisation context, manager context, and environmental context of e-payment system. The study of Gholamie et al., (2010), adopted unified theory of acceptance and use of technology in investigating intentions to adopt e-payment systems. The findings reveal that effort expectancy, perceived benefit, trust, social influence and demographic factors were important determinants of e-payment system adoption. Afaha (2019) assessed the relationship between e-payment systems and economic growth using autoregressive distributed lagged regression. Notably, the studies have focused on qualitative studies (Igudia, 2017; 2018), economic growth, and other dimensions of e-payment systems such as its effect on consumption behaviour (Oyelami et al., 2020). In other studies outside Nigeria, studies have mostly been on individual consumer adoption of e-payment channels (e.g Intan et al., 2018). The current study is focused on a new e-payment system (PAPSS) that is designed to demystify cross-border payment challenges in sub-Saharan African trade. In this regard, the analysis of factors influencing PAPSS adoption among MSMEs is essential. The study is significant because of PAPSS significant effect in sub-saharan Africa where the e-payment system is targeted. It is a novel study. The significant factors will provide guide for policy development, programme design and implementation. Thirdly, the entrepreneurs will become aware of the e-commerce development on the payment of foreign goods in local currency, and availability of reliable payment gateway.

2.3 Theoretical background

Studies on e-payments have used models like diffusion of innovation (DOI), TAM, theory of reasoned action (TRA) and unified theory of acceptance and use of technology (UTAUT). The

adopted theories were mostly on existing innovations with the intention of understanding factors that influence adoption. Most of the models integrated in the studies such as TAM and TRA have shown existence of limitations and incompleteness of the models thereby making researchers to adopt integrative models in their studies. Consumers are complex in nature. To understand how consumers behave in adopting e-payment innovations it demands additional constructs. In this context, the study focused on TAM which is mostly used in e-payment innovations because of its robustness, adaptability and consistency of results in studies related to acceptance of e-payment innovations (Ramos-de-Luna et al., 2019). However, it is deemed incomplete (Liébana-Cabanillas et al., 2017) thereby leading to suggestions for extension of its constructs. Therefore, unlike the traditional TAM that has three constructs of perceived ease of use, perceived usefulness and attitude as important factors determining behavioural intention, the study includes additional constructs analyse the behaviour of entrepreneurs in accepting PAPSS as e-payment system for cross-border payments of marketed products.. This approach is consistent with earlier studies. For instance Chong et al., (2012) included trust, variety of services, social influence, costs, and trialability in predicting consumer decisions to adopt m-commerce. Ramos-de-Luna et al., (2019) extended TAM with additional constructs of subjective norms and security in analysing adoption of m-payment systems. This is similar to the study by Munoz-Leiva et al., (2017) that extended the constructs of TAM with social image, perceived trust, and perceived risk in studying m-banking apps.

2.4 Hypotheses development

2.4.1 Perceived relative advantage.

Relative advantage is one of the indicators that Rogers (2003) considered as factor for studying technology characteristics. Wang, Meister, and Wang (2008) argued that it is different from perceived usefulness. It explains the level to which an individual is able to recognise that the new technology has better benefit over an existing one. Such advantage can be use advantage when it promotes smooth payment and minimal presence of risk of theft, and technological advantage when it promotes easier and faster processing and automation of payment transactions (Palesh et al., 2022). In e-payment system, relative advantage is within the context of satisfaction, time utility, cost factor, security and transparency considerations (Moncada et al., 2022). In this context,

a new e-payment system like PAPSS should be more advantageous compared with others such as bank transfers and credit card payments. The premium advantages over existing options should encourage its adoption better than existing option in the nation. Relative advantage has been extensively used in studying intention to adopt e-payments such as m-wallets (Hidayat-ur-Rehman et al., 2022), and e-payments adoption among small and medium scale enterprises (Yawised & Apasrawirote, 2021). Previous studies confirm that it is a predictor of behavioural intention (Ali et al., 2022) though not significant in some others (Moncada et al., 2022). In this study, the authors propose a relationship between relative advantage of PAPSS and intention to use, as well as perceived ease of use given that a better innovation should also transcend usage without stress.

The authors hypothesise:

H1: Perceived relative advantage impacts ease of use of PAPSS

H2: Perceived relative advantage is positively related to intention to use PAPSS.

2.4.2 Perceived compatibility

Compatibility is a function of potential user's perceived consistency about an innovation in terms of values, needs and past experiences (Schierz et al., 2010). The emphasis is on coherence which must exist between the innovation and potential adopter's values, experiences and behaviour (Ramos-de-Luna et al., 2017). In cases where the potential user's needs and the innovation have higher values of compatibility, intention to use the innovation is enhanced (Hidayat-ur-Rehman et al., 2022). Thus, where the potential users consider the use of PAPSS to be consistent with their choice of ease of usage, values and usefulness intention is enhanced. Perceived compatibility is linked to perceived usefulness on grounds of fit with lifestyle and consistency with the technology (Liebana-Cabanillas et al., 2018b). Thus, entrepreneur's lifestyle of use of technology in payments should promote adoption. Earlier studies on e-payment confirm its relationship with perceived usefulness (Ramos-de-Luna et al., 2017) and perceived ease of use (Liebana-Cabanillas et al., 2018b). Following these confirmations, the role of past experiences on related innovations, and the importance of behavioural patterns on pre-adoption, the variable is included in the model to ascertain its relationship with perceived ease of use and perceived usefulness. Therefore, the authors hypothesise:

H3: Perceived compatibility positively determines the perceived ease of use of PAPSS

H4: Perceived compatibility is positively related to perceived usefulness of PAPSS

2.4.3 Perceived ease of use

Perceived ease of use is defined by Davis (1989) in the context of how users perceive an innovation to be simple and effortless. It is deemed to have a simultaneous effect on self-efficacy, instrumentality and behavioural intention (Ali et al., 2022). Thus, it influences user attitude and usefulness (Davis, 1989; Oloveze et al., 2022a). To enhance chances of adoption by potential users, e-payment innovations should be easier to use. Extant studies indicate that it is one of the most important variables in assessing acceptance and adoption of e-payment innovations by potential users. PAPSS is a novel e-payment system that potential users should find easier to use prior to adopting it. Studies on e-payment show that it is a predictor of perceived usefulness in location-based services (Hossain et al., 2017), online shopping (Oloveze et al., 2022a), and also on attitude (Ha, 2020) though not significant on intention to use NFC technology (Ramos-de-Luna et al., 2017). The authors hypothesise:

H5: Perceived ease of use positively determines firms' attitude to the use of PAPSS.

H6: Perceived ease of use positively determines perceived usefulness.

2.4.4 Perceived usefulness

Perceived usefulness deals with users' perception of an innovation being able to improve their performance (Davis, 1989). In diffusion of innovation theory, it is the extent to which an innovation is better than existing one (Rogers, 2003). In this guise, PAPSS offers the benefit of reducing excessive reliance on third currency and payment challenges associated with trade in Africa's more than 41 currencies, and remove the reliance on correspondent bank (Aro, 2022). Thus, a new technology like PAPSS should offer better utility than the existing option (Oloveze et al., 2021). The original construct by Davis (1989) showed a dual effect on attitude and intention to use. Similarly, related studies confirm the variable to be related to attitude (Ramos-de-Luna et al., 2019) and intention to use (Oloveze et al., 2022b) but not significant in others (Muñoz-Leiva et al., 2017). In the context of PAPSS, it is designed to improve payment performance for MSMEs. The authors hypothesise:

H7: Perceived usefulness is significantly related to firms' attitude to the use of PAPSS.

H8: Perceived usefulness is significantly related to intention to use PAPSS.

2.4.5 Attitude to the use

Attitude is a reflection of individual's like or dislikes. It has the capacity to affect users' decision making and behavioural response to an object (Fishbein & Ajzen, 2003). It consists of other dimensions that include cognitive, conative and emotional dimension. In addition, it is an important variable that helps in forming behaviour (Plewa et al., 2012; Oloveze et al., 2022a) and defining adoption by reducing obstacles to the adoption of innovation (Ramos-de-Luna et al., 2019). Theories such as technology acceptance model and theory of planned behaviour suggest that it is an essential predictor of intention. Though attitude can be formed overtime through experience (Liebana-Cabanillas et al., 2014b) it is instrumental in forming behaviour. The demand for e-payment channels by MSMEs in the past should provide a ground for positive attitude from entrepreneurs in adopting PAPSS. Extant studies confirm the determinant effect on intention to use e-payment innovations (Higueras-Castillo et al., 2019). SMEs, young entrepreneurs, households and financial institutions are intended to be the beneficiaries of PAPSS. The authors hypothesise:

H9: Attitude to the use positively determine intention to use PAPSS.

2.4.6 Perceived trust

Extant studies in marketing have highlighted the importance of trust. In the context of trust, reliability of the promise by the authority and the ability to remain committed in relational exchange is paramount. It influences acceptance of innovations (Ali et al., 2022). The initial trust is important in affecting consumer decision (Kim et al., 2008) because of its role in pre- and post-adoption behaviour (Talwar et al., 2020). At the first instance, trust is higher because of uncertainties emanating from lack of prior experience and knowledge (Higueras-Castillo et al., 2019). It plays a major role on the individual's ability to assume the opportunity of meeting requirements (Lu et al., 2011) though time and experience can influence the initial trust level (McKnight & Chervany, 2002). It is considered an important variable for securing user acceptance of innovation. In this context, adoption of PAPSS demands strong initial user trust to affect acceptance and subsequent use and recommendation. Studies have estimated its relationship with intention to use (Chen et al., 2022) and attitude (Higueras-Castillo et al., 2019) but scientifically proven not to be significant in others (Liébana-Cabanillas et al., 2018c). Therefore, where the users

perceive PAPSS to be reliable and compliant with the promise, it will elicit positive attitude and intention to use the innovation. The authors hypothesise:

H10: Perceived trust is positively related to intention to use PAPSS.

H11: Perceived trust positively influence attitude to the use of PAPSS.

2.4.7 Perceived risk

The concept of risk to consumer behaviour is critical in consumer's decision making. User behaviour has an element of risk. In e-payment, risk is concerned with transaction uncertainties and consequences of adopting behaviour (Kalinic et al., 2019). Such uncertainties include loss of money (Kalinic et al., 2019), and security and privacy concerns (Ali et al., 2022). In this respect, it is a critical downside for users in adopting innovation. Concerns such as exposure to fraud, nonexistent transaction payment history, and other irregularities associated with e-payment deter users (Ozturk et al., 2017). With innovative e-payment systems like PAPSS, user perception of risk can constrain adoption (Oloveze et al., 2022b). PAPSS belongs to e-payment category. As a new e-payment system and the prevailing challenges of internet fraud, users' association of risk with PAPSS might be critical in accepting the innovation. Innovations might fail at acceptance level because of risk concerns especially where there is insufficient control over privacy, fraud and security. Extant studies show that it is negatively related to intention to use (Kalinic et al., 2019). The authors hypothesise:

H12: Perceived risk is negatively determining intention to use PAPSS.

2.4.8 Entrepreneurial intention

This is a commitment by an entrepreneur to begin something new which can be a business or something new that aids the business processes. It encompasses when an individual sets off to embark on a new venture and stay committed to it (Ghofarany & Satrya, 2021). It includes the willingness (Nguyen 2017), commitment (Ghofarany & Satrya, 2021), closer match between masculinity and entrepreneurial attributes (Diaz-Garcia & Jimenez-Moreno, 2010) and traits capable of contributing to the success of motive, business establishment or ancillaries to the business. Generally, it is associated more with men than women (Diaz-Garcia & Jimenez-Moreno, 2010).

Figure 2: Proposed Structural Model of PAPSS payment system acceptance
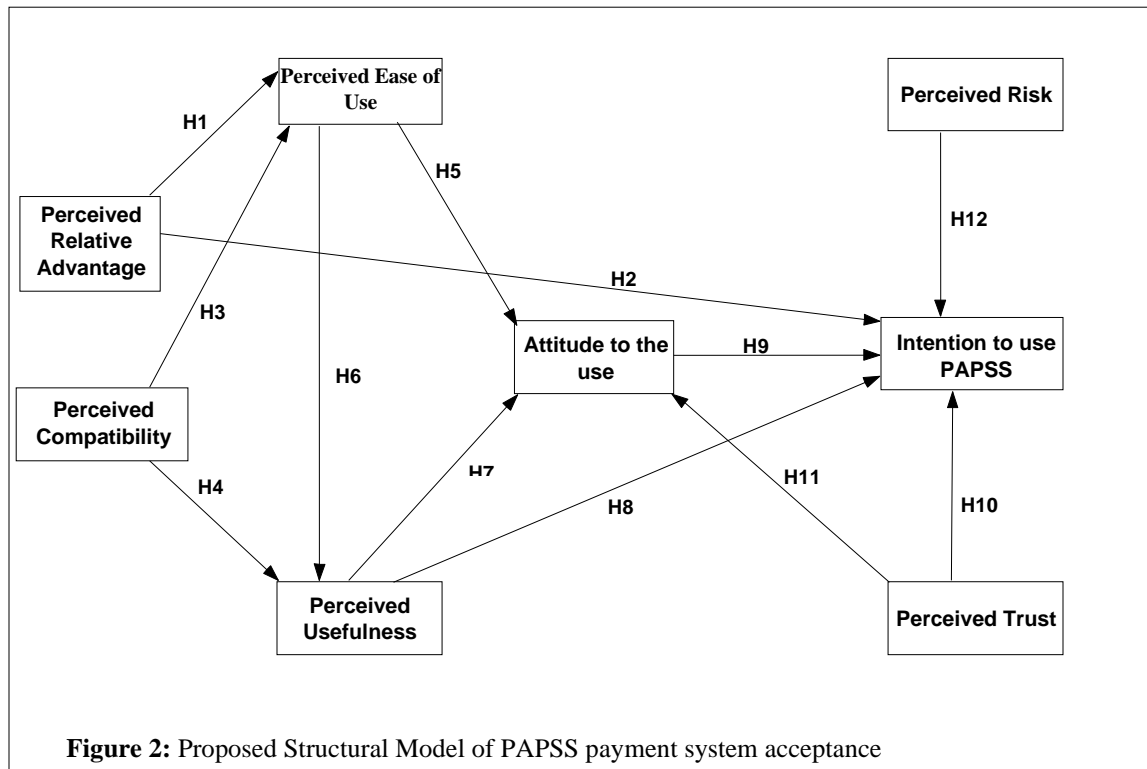
3. Methodology

3.1 Measurement development

The measurement items were adapted from related studies on technological innovation (See table 1). The questionnaire comprised of closed questions that are designed on 7-point Likert scales. It was self-administered and through online means using Google form. Preliminary tests were conducted prior to administration to ensure reliability. The suitability of the measurement scales was further conducted for reliability and validity of the instrument through confirmatory factor analysis. STATA 13 and SPSS 23 were adopted. Cronbach Alpha, composite reliability, and average variance extracted was used for reliability by adopting a reference point of 0.6, 0.7 and 0.5 respectively (Liebana-Cabanillas et al., 2014a). All the variables satisfied the reference point (see Table 2). Perceived relative advantage (PRA) was close to the threshold for composite reliability and average variance extracted (AVE). Similarly, perceived trust (PT) was close to the threshold for AVE. Validity was performed using convergent validity through factor loadings of the indicators and they were higher than 0.6 (Bagozzi & Yi, 1988). However, PRA3, PRA4, PT4,

perceived risk4, and perceived compatibility4 were removed from the analysis because the factor loads were less than 0.6. Thus, the latent variables explain observed variables in the study.

Table 1: Measurement items

Study Constructs	Items	References
Perceived ease of use	E-payment system like PAPSS will be easy to use	Liébana-Cabanillas et al., (2017)
	PAPSS is understandable and clear	Schierz et al., (2010)
	Using it requires minimum effort	Moore & Benbasat (1991)
	Overall, I believe it will be easy to use	
Perceived usefulness	My business will find use of PAPSS useful	Ramos-de-Luna et al., (2019)
	PAPSS will be very effective to small businesses	Schierz et al., (2010)
	PAPSS will make handling payments easier	Davis (1989)
	It will be helpful in my business' financial transactions	
Attitude	Using PAPSS is a good idea for small businesses	Ramos-de-Luna et al., (2017)
	The use of PAPSS is beneficial	Higueras-Castillo et al., (2019)
	It will be convenient to use PAPSS	
	I think using PAPSS is a good decision	
Perceived trust	I think PAPSS will keep the commitment it makes	Liébana-Cabanillas et al., (2014b)
	I think PAPSS will be responsible	Munoz-Leiva et al., (2017)
	I think PAPSS will be honest	Liébana-Cabanillas et al., (2018)
	I think PAPSS will be trustworthy	
Perceived relative advantage	Using PAPSS will help fulfil financial tasks faster	More and Benbasat (1991)
	It will improve the quality of work my business does	Wang et al., (2008)
	It is more useful than existing options	
	It will effectiveness than existing options	
Perceived compatibility	PAPSS is compatible with all aspects of my business' work	Schierz et al., (2010)
		Ramos-de-Luna et al., (2016)
	It is compatible with my business' current situation	Moore & Benbasat (1991)
	PAPSS is consistent with the way I like to get paid	
	Using PAPSS for instant payments fits into my work style	
Perceived risk	Other people can know information about my business transactions if I use PAPSS	Kalinic et al., (2019)
		Liébana-Cabanillas et al., (2014b)
	There is a high potential for lost money if I get paid using PAPSS	
	There is significant risk in taking payments for purchases using PAPSS	
	I think that receiving payments with PAPSS is risky	
Intention to use	Given the opportunity, my business will use PAPSS	Munoz-Leiva et al., (2017)
	My business is likely to use PAPSS in the near future	Kalinic et al., (2019)
	My business is open to using PAPSS frequently in the future	Davis (1989)
	My business intends to use PAPSS when the need arises	

Table 2: Measurement model evaluation

Variable	Item	Factor Loads	Cronbach Alpha	Composite reliability	Average variance extracted	Mean	Standard deviation	R^2
Perceived relative advantage	PRA1	0.631	0.86	0.58	0.41	5.61	1.29	-
	PRA2	0.648						
Perceived compatibility	PC1	0.762	0.90	0.79	0.55	5.51	1.26	-
	PC2	0.757						
	PC3	0.708						
Perceived ease of use	PEoU1	0.816	0.91	0.87	0.63	5.88	1.18	0.61
	PEoU2	0.834						
	PEoU3	0.736						
	PEoU4	0.773						
Perceived usefulness	PU1	0.751	0.94	0.86	0.61	5.96	1.22	0.77
	PU2	0.800						
	PU3	0.775						
	PU4	0.787						
Attitude to the use	Att1	0.794	0.94	0.83	0.55	5.86	1.23	0.91
	Att2	0.739						
	Att3	0.780						
	Att4	0.634						
Perceived trust	PT1	0.628	0.94	0.66	0.39	5.39	1.39	-
	PT2	0.625						
	PT3	0.618						
Perceived risk	PR1	0.811	0.84	0.90	0.74	4.09	1.62	-
	PR2	0.880						
	PR3	0.890						
Intention to use PAPSS	INT1	0.756	0.94	0.88	0.65	5.84	1.17	0.66
	INT2	0.838						
	INT3	0.794						
	INT4	0.837						

3.2 Collection of data

Convenience sampling and snowball sampling was used to draw 182 samples from population of entrepreneurs and owners of MSMEs in Nigeria who accepts e-payment channel for transactions.

4. Results

4.1 Structural model

In evaluating the structural model, the goodness of fit indicators was used by adopting the global measures for goodness of fit. The recommendation in literature (Bollen, 1989) supports the model to be a good fit given the overall indicators. They either exceeded the recommended thresholds or were close to the thresholds (X^2/df=1.481; NFI=0.853; RFI=0.832; IFI=0.947; TLI=0.938; CFI=0.946; RMSEA=0.073; SRMR=0.052). The maximum likelihood estimation was adopted because of the small sample while the statistical significance of the standardised structural loads was used in assessing the structural model (See Table 3 and Figure 3).

Table 3: Hypothesised relationships

Hypotheses	Std. β	S.E	z	P-value	Empirical support
H1: Perceived relative advantage→ Perceived ease of use	0.600	0.12	5.05	0.000	Yes
H2: Perceived relative advantage→ Intention to use PAPSS	0.381	0.11	3.46	0.001	Yes
H3:Perceived compatibility→ Perceived ease of use	0.204	0.13	1.63	0.104	No
H4: Perceived compatibility → Perceived usefulness	0.228	0.07	3.21	0.001	Yes
H5: Perceived ease of use→ Attitude to the use	0.142	0.06	2.07	0.038	Yes
H6: Perceived ease of use→ Perceived usefulness	0.701	0.06	11.04	0.000	Yes
H7: Perceived usefulness→ Attitude to the use	0.560	0.06	8.20	0.000	Yes
H8: Perceived usefulness→ Intention to use PAPSS	0.412	0.15	2.59	0.010	Yes
H9: Attitude to the use→ Intention to use PAPSS	0.203	0.19	1.02	0.049	Yes
H10: Perceived trust→ Intention to use PAPSS	0.325	0.12	2.71	0.007	Yes
H11: Perceived trust→ Attitude to the use	0.359	0.05	7.11	0.000	Yes
H12: Perceived risk→ Intention to use PAPSS	-0.027	0.06	-0.42	0.674	No
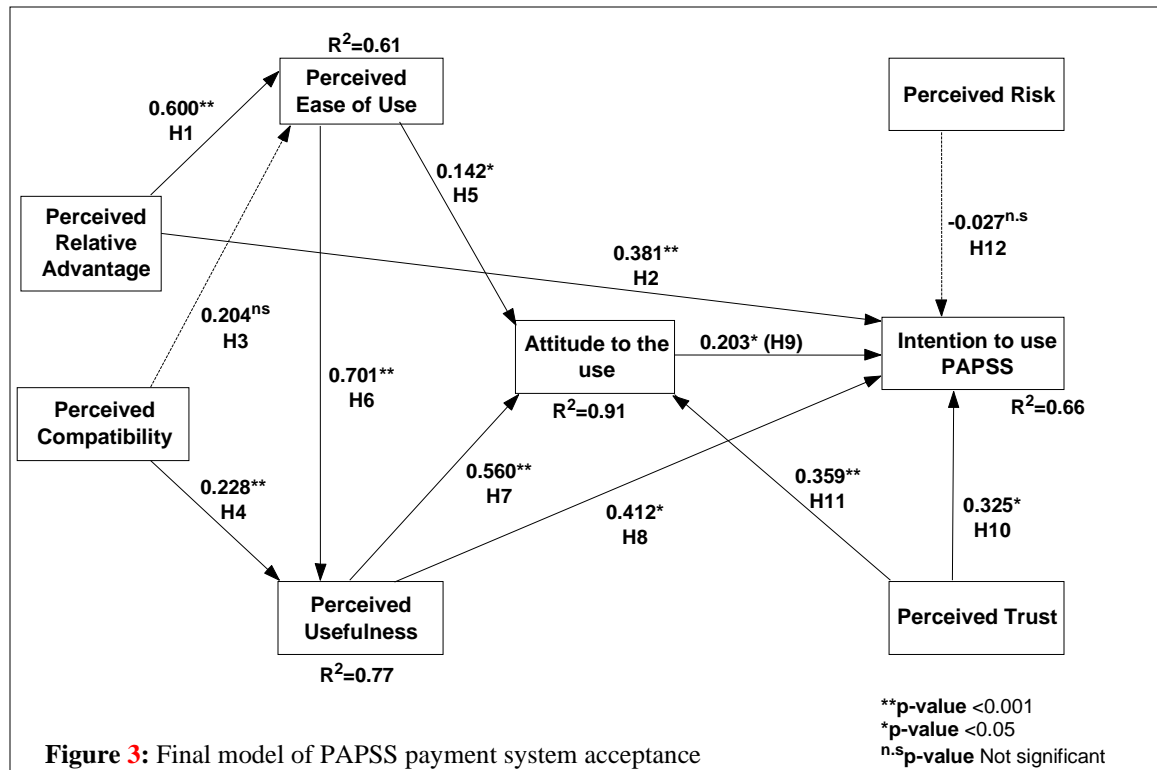
Figure 3: Final model of PAPSS payment system acceptance

p-value <0.001
*p-value <0.05
n.sp-value Not significant

5 Discussion, conclusion, implications, limitations and directions for further studies

5.1 Discussion of results

The proposed hypotheses, their standardised coefficients, and statistical significance are shown in Table 3 and Figure 3. The test was conducted using structural equation modeling. 10 of the 12 tested effects were statistically significant. H1 and H2 are supported ($p \leq 0.001$), demonstrating the value placed by potential users on adoption of PAPSS over existing options on cross-border payments. This confirms results of previous studies on intention to adopt e-payment (Hidayat-ur-Rehman et al., 2022). H3 is not validated thereby was rejected. However, perceived compatibility present a significant effect on perceived usefulness, thereby supporting H4 ($\beta=0.228$, $p \leq 0.001$), so that as entrepreneurs perceive greater compatibility with their past e-payment and their needs, perception of PAPSS's usefulness increases. This is consistent with related studies (Ramos-de-Luna et al., 2017). H5 ($\beta=0.142$, $p \leq 0.05$) and H6 ($\beta=0.228$, $p \leq 0.001$) present a significant effect thereby supporting the relationship between perceived ease of use and attitude to the use, and perceived ease of use and perceived usefulness respectively. This is confirms findings of related studies (Oloveze et al., 2022a). H7 and H8 are from perceived usefulness. The variable presents a

significant relationship with attitude to the use as well as intention to use PAPSS, thereby validating H7 (β=0.560, $p \leq 0.001$) and H8 (β=0.412, $p \leq 0.05$) respectively. This is consistent with earlier studies on related e-payment technologies (Liébana-Cabanillas et al., 2014b). The attitude to use is confirmed to be related to intention to adopt PAPSS following the statistical significance of the estimate thereby confirming H9 (β=0.203, $p \leq 0.05$), so that, as entrepreneurs favour and like the use of PAPPS, intention to use it for cross-border payments increases. This is consistent with earlier results on related e-payment innovations (Munoz-Leiva et al., 2017). H10 and H11 are from perceived trust. The relationships are significant in influencing intention to use PAPSS and attitude to the use respectively, thereby validating H10 (β=0.325, $p \leq 0.05$) as suggested in scientific literature (Hidayat-ur-Rehman et al., 2022), and H11 (β=0.359, $p \leq 0.001$) as confirmed in scientific literature (Liébana-Cabanillas et al., 2018c). H12 is not validated thereby was rejected.

5.2 Conclusion and implications

Considering the direct antecedents to intention to adopt PAPSS – perceived relative advantage, perceived usefulness, Attitude to the use, Perceived trust, and Perceived risk –the result indicate perceived usefulness to be the strongest predictor of intention to use PAPSS in the order to importance. It presents perceived usefulness as the most important significant, direct and positive determinant of entrepreneurs' intention to use PAPSS as e-payment channel in cross-border payments. This projects the value, benefits, improved performance, and utility the potential users expect from the innovation. The essence of usefulness is further highlighted by the influence on attitude which is a necessary factor in disfavouring or favouring the use of PAPSS. This is consistent with the principles of TAM. Attitude is formed from overtime and through past experiences. The link between perceived usefulness and attitude deepens the knowledge on attitude formation based on utility from PAPSS; following favourable experience from related e-payment channels. Secondly, perceived relative advantage proves to be an important variable in the model. It is indicative of entrepreneurs' perception of PAPSS having more usefulness and effectiveness than existing option, and as well being able to assist them to improve their quality of financial transaction task in cross-border payment. The positive and significant result indicates that potential users of PAPSS value it more and retains greater consideration to it, so that, increase in perception of its benefit in instant payment among others will increase their intention to use PAPSS. The positive and significant result of perceived trust confirms the important role of trust in adoption of

innovation. In this context, the ability of the entire environment of PAPSS to be able to remain committed to instant payments, safety of transactions and remain responsible to its promises is paramount in influencing intention to use it. The result indicates entrepreneurs' disposition to uncertainties to the novel e-payment technology as Liebana-Cabanillas et al., (2018c) consider it to be key to the successful adoption of innovations of this type. Attitude to the use is also positive and significant in determining use of PAPSS. Entrepreneurs' feelings of PAPSS being beneficial, convenient and a good idea for cross-border payments is a firm indicator of their positive attitude toward potential adoption of PAPSS.

It is noteworthy that perceived relative advantage, perceived trust, and attitude to the use has close margin of effect on intention to use PAPSS while perceived usefulness has the strongest effect.

Considering the paths in the model that determine attitude to use PAPSS, perceived usefulness, perceived ease of use, and perceived trust presents positive and significant influence. Perceived usefulness has the strongest effect on attitude thereby confirming the role of values, efficiency and effectiveness to be paramount in entrepreneurs' positive feeling about the use of PAPSS. The role of perceived usefulness on attitude confirms importance of values and improved performance in showing feelings of likeness and favourableness to PAPSS adoption. Perceived ease of use confirms the importance of PAPSS being clear in usage and understandable. The feelings of potential users center on the promise of less effort required in using PAPPS which is similar in other e-payment studies. Again, the significance of perceived trust on attitude reinforces the place of trust in adoption of PAPSS. Trust issues tend to arise when there are uncertainties around innovation such as the prevailing glitch in e-payment in Nigeria within the period of the study.

However, considering the role of perceived ease of use and perceived compatibility on entrepreneurs' perception of usefulness of PAPSS, the variables confirm their importance on value of usefulness of PAPSS. Perceived ease of use reinforces the strength of its importance on usefulness just as the original TAM indicates but it is stronger compared to some studies (Munoz-Leiva et al., 2017). Again, compatibility with existing practice on e-payment process confirms the importance of consistency between entrepreneurs' technology lifestyle, valuating e-payment use in business and adoption of PAPSS. Though the strength of the relationship is weak, this can be traced to the period of the study where there was cash scarcity and the rapidly rising usage of e-payment was hindered by e-payment glitches.

On the other hand, the importance of perceived ease of use is further highlighted by the consideration of PAPSS relative advantage over existing option. This confirms that as entrepreneurs perceive ease of use of PAPSS to be better, more clearly and understanding than existing option adoption will be impacted positively. Thus, the context of ease of use of PAPSS must be relatively better than existing option to entrepreneurs.

These results present interesting implications for PAPSS adoption by entrepreneurs. It presents a shift from the payment norm in sub-Saharan payment norm. The practical dimension is the confirmation of entrepreneurs' demand for better e-payment options. The implications of perceived usefulness call for efforts to highlight the utility of PAPSS and the improved value offering. In this context, there is need to design marketing communication strategies to educate potential users and create more awareness of the better performance offering of PAPSS. It is vital to highlight that despite the strong influence of perceived usefulness, there are other factors that have effect on adoption of PAPSS though they are weaker – perceived trust, attitude to the use, and perceived relative advantage. These are vital pointers for designers of PAPSS on direction of improvements to create more added values thereby making it more attractive to entrepreneurs and other potential users.

The context of the effects on entrepreneurs' attitude to the use towards adopting PAPSS highlights the importance of trust, ease of use, and usefulness in formation of positive feeling and like towards the use of PAPSS. This implies policy and programme formulation to attract and deepen user trust on use of PAPSS, facilitate education on the benefits and simplicity of the innovation to further encourage positive feelings on the use of PAPSS. Again, designing value proposition in marketing campaigns, and fostering commitment to authorisation technology to deepen trustworthiness is imperative to encourage positive attitude to the use of PAPSS.

The effect of perceived relative advantage on perceived ease of use towards adopting PAPSS indicates the direction of focus for developers to consider on improving PAPSS. The strength of the relationship emphasise the direction to adopt in motivating entrepreneurs who are technology enthusiasts because they have the potency to promote mass adoption.

The context of the effects influencing usefulness toward adopting PAPSS presents some practical implications. Firstly, in motivating entrepreneurs to adopt PAPSS, the contextual environment of compatibility with existing e-payment lifestyle, and users' affinity to clear understanding of

technology is paramount. As entrepreneurs value the improved benefit, compatibility with their choice of payments is vital. Neglecting it and the preference for technology that uses less effort will be catastrophic.

5.3 Contribution and further studies

The predictive power of the model on entrepreneurs' intention to use PAPSS is 66% which is higher than average and others on related e-payment channels (Munoz-Leiva et al., 2017). It is noteworthy that this is a novel research that empirically evaluated the determinant factors that predict entrepreneurs' intention to adopt the cross-border payment (PAPSS) in sub-Saharan Africa. Again, one of the key contributions of the study is the presentation of empirical determinants with perceived usefulness as the strongest direct determinant of entrepreneurs' intention to use PAPSS.

Future lines of studies should consider replicating the model in areas where PAPSS were rolled out. Due to the small sample, increasing the number of participants to the study is suggested while focusing the study on experiential moderating influence of related innovations can provide deeper insight on adoption of PAPSS. The significance of the determinants in the model does not exclude inclusion of other variables such as risk and security, government support and firm readiness. Finally, the authors suggest comparison of the role of participating units or PSPs in ensuring the successful diffusion of PAPSS.

5.4 Limitations

Though the contributions of the study are profound, a key limitation is the sample size and use of cross-sectional design. The use of longitudinal design might present a dynamic result to reinforce the findings of the present study. In addition, the determinants are not limited to the inclusions in the model. Therefore, extensions and modifications are encouraged by including other variables such as experience and entrepreneurs' innovativeness.

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