Point of Sales (POS) Security Information Management (POS-SIM): An Assessment of Trust and Security Perception

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Keywords

Point of Sales;

Trust Perception;

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Demographic variance;

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Abstract

A POS system is an invaluable technological tool that has successfully replaced the traditional cash register banking system and maintains constantly evolving tech-driven solutions. However, the user's security and trust perception on the POS terminal is paramount for the success of the financial services. Although technological advancement allows improved banking, technology, and its deployment have inherent flaws and vulnerabilities, which expose it to a wide range of attacks since many inherent traditional security flaws cannot be simply eroded and addressed by available controls.

In Nigeria today, the POS has revolutionized the banking sectors and cashless implementation where millions of unbanked citizens can comfortably perform cash deposits, withdrawals, pay bills, and other financial services without physically stepping into the banking hall.

The adoption of the Technology Acceptance Model (TAM) has assisted in getting this done seamlessly by looking at behavioral intentions as a factor that leads people to use available technology. TAM relies solely on two main variables: Perceived ease of use (PEOU) and Perceived usefulness (PU).

The mixed method involving qualitative and quantitative data collection was used to gather information for this work. 700 copies of questionnaires were distributed and analyzed using smart pls-sem4, and a semi-structured interview was conducted with purposively selected 21 respondents who administered the questionnaires. These Findings show that customers use the POS for banking and financial services because of demographic factors such

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as gender, income, occupation, and education. Customers also prefer POS terminals to banking halls because it provides them with availability, flexibility, ease of use, error tolerance, self-service, and service efficiency.

1. Introduction

The banking and financial services industries in Nigeria are highly information-intensive sectors that rely on information technologies to provide good services and products to their customers and clients. These high-demand services prompted Nigeria's government, the Central Bank of Nigeria (CBN), banks, telecommunications companies (Telco), and other financial institutions to leverage their resource, to work towards a cashless economic system (Emeka et al., 2019). Acha (2017) simply defined a cashless economy as an environment that does not mean, by and large, the end of cash transactions within the financial setting but one in which the sum of cash-based exchanges is kept to the barest minimum. He further stated that a cashless initiative is a substitute for cash transactions through electronic means using information and communication technologies (ICT). Automated Teller Machines (ATM) were introduced into banking halls and bank precincts to facilitate dispensing of cash (withdrawal) to customers. Undisputedly, the adoption of point of sale (POS) as an option for making a cashless environment viable has reached places where physical banking structures cannot be erected, making banking services available to people whenever needed.

2. Background

Banking is transforming from being based in physical branches to using information technology (IT) and big data, together with highly specialized human capital (OECD, 2020). OECD (2020) agreed that traditional banks have seen parts of their core business ranging from payment services and credit to advisory services, encroached upon by digital competitors. The advantages held by Fintechs are that they can utilize state-of-the-art innovation and technology operate learner commerce and centre on those business sections with higher returns. Nigerian telecommunication companies are expanding into financial services to compensate for declining voice phone and message app competition (Fakoyejo, 2021). They are increasingly relying on the Internet as a distribution channel to reach a larger population. Mobile telecommunications providers control connectivity through alternate delivery channels (ADC), mobile devices, and point-of-sale (POS) to bridge the gap between over-dependence on the internet and financial services. With advancements in POS terminals, it is now possible to operate in rural and urban areas of Nigeria without depending on Internet services to function.

2.1 Point of Sales (POS)

POS as financial service devices are effectively information technologies (IT) artifacts or digital technologies artifacts of transformations. As Information Technology (IT) artifacts or digital technology artifacts, they carry some levels of risk, part of which is epistemic uncertainty (Adesemowo, 2021). This is based on what they are and their capability. It is known that a key fundamental of risk is security; which is important in the use and adoption of technology. More so, beyond the degree of use, hedonic motivation, and pricing, a factor of acceptance or adoption is trust (Alalwan et al., 2017). Consequently, the survival of the deployment of POS for wide acceptance must be based on well-grounded security and trust as explained below.

2.2 Security

It is important to create a safe and reliable environment for customers to comfortably carry out transaction using POS as an alternative channel delivery device. Lord (2021) observed that all POS do have some levels of risk when it comes to security. Attackers exploit vulnerable systems to launch automated attacks on the Point of Sale (POS) environments. The basic POS breach phases include infiltration, propagation, exfiltration, and aggregation. Infiltration involves gaining access and collecting information through exploiting system vulnerabilities or social engineering techniques. The attacker then spreads malware into the target system, accessing its memory and collecting desired data. Thereafter, the data is moved to another location within the target's environment for aggregation and finally offloaded to an external location accessible to the attacker (Whitteker, 2014). It is crucial to put in POS security measure to prevent unauthorized access to the electronic payment system. This in itself will minimize the risks associated with debit, gift, and credit card fraud.

2.3 Trust

Trust plays an imperative part in the survival of the card payment systems in any ADC. The customers and users are entitled to feel secure amid the transaction process and the POS. A POS terminal operator must know the wants and needs of their users at every particular point in time. The operator should find a way to promote the user's satisfaction, when and after the financial transaction has taken place. (Ion & Dragovic, 2015) made it clear that POS was planned and designed in such a way that it should be tamper-proof. However, numerous of the extortions exuded through distorted and clowned POS. The foremost eminent attacks on the POS terminals are on the ease of cloning the magnetic stripe, visual signature confirmation, and the supported complete need for confirmation in extraordinary cases (Ion & Dragovic,

2015). In this manner, the nearness of dangers and/or risks that will emerge ought to be avoided and conceivable so that the clients feel secure when doing their transactions.

2.4 POS Security Information Management (SIM)

The customer's POS (Point of Sale) security information management consists of the practices, procedures, and technologies used to protect the security and privacy of sensitive information processed and stored in a POS system during a transaction. This information typically includes credit card numbers, customer names, addresses, and other personal information. The management of this sensitive information is critical for the success of POS terminals as a delivery alternative channel for banking and financial services in Nigeria.

3. Literature review

Through their different research projects, different researchers have contributed to how people accept and use POS technology. Many issues have been addressed and findings reported regarding POS and electronic banking. Dharma et al., (2019) posit that quality and subjective norms are factors that are very important to be considered within the use of POS that are mediated by perceived ease of use, perceived usefulness, and attitude. It was further stressed that owners should choose experienced POS developers to improve information quality and ease of use. The system should be comprehensive, precise, and aligned with decision-making needs while also being user-friendly and enhancing execution, efficiency, work motivation, and work attraction. The efficiency and availability of the POS across the Nigerian environment, as reported by Adeoti (2013), depend on the quality of services, a good IT communication network, uninterrupted power, and the communication security of the network. Cruijsen & Mirjam (2006) posits that customers may not value the flexibility of the Point of Sale (POS) system when it comes to banking services. When customers interact with the POS system during the payment process, their primary concern is usually the transaction's security, trust, efficiency, and convenience. Due to POS terminals dealing with sensitive data such as debit, gift, and credit card information (Lee et al., 2014), there is still no POS system that guarantees security, resulting in a large number of hacked POS systems in various countries. This makes the trust and security to be very critical when implementing the cashless economy through the POS technology. The positive impact of the POS implementation in driving the cashless economy cannot be overlooked because it’s one of the electronic means of transaction. The determined impact of demographic characteristics, PU, PEOU, subject norms (SNs), and image on POS adoption is very important in taking cognizance of trust and security (Bend, 2020; Dahunsi & Omotayo, 2015; Tamajong, 2020). The satisfaction of customers with electronic banking systems is based on System

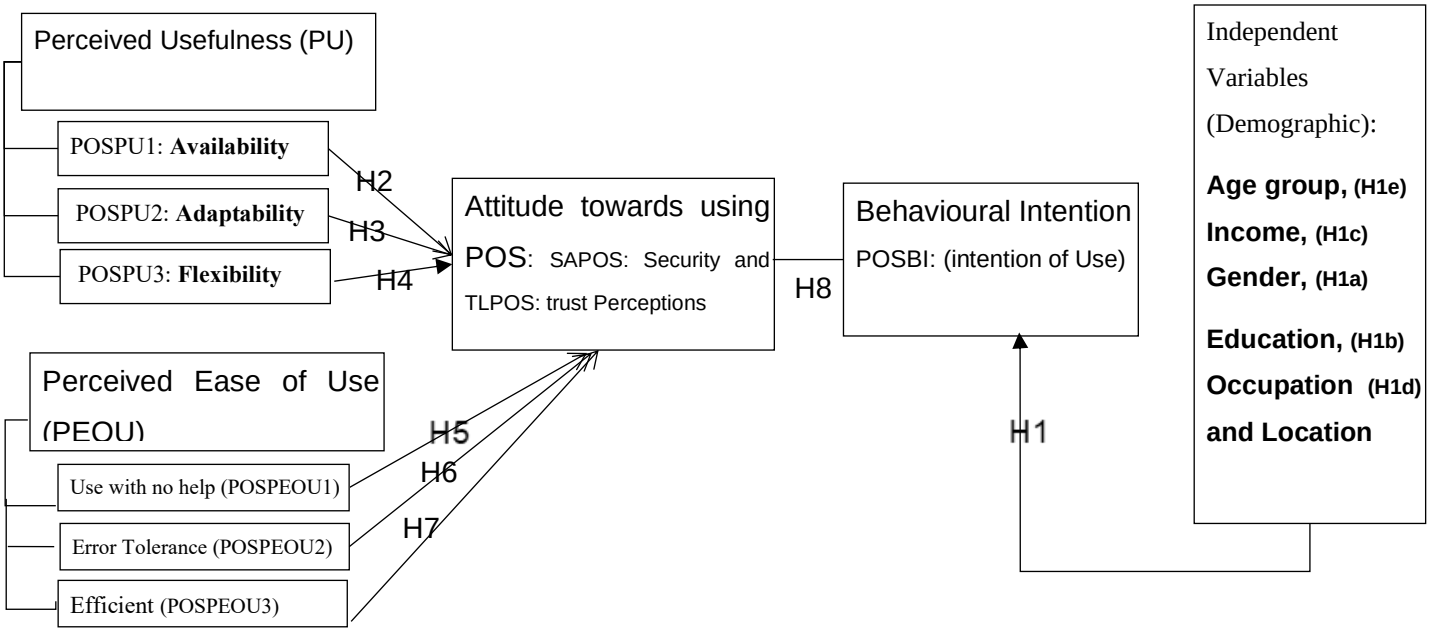
Quality, Continuance Intention, Information Quality, Service Quality, and Customer Satisfaction (Okechi & Kepeghom, 2013).

3.1 Conceptual Framework

As in varying research literature, a conceptual framework is a written or visual representation of an expected relationship between variables that are of interest in the study (Fetherston, 1994). The conceptual framework in this study relies on the Technology Acceptance Model (TAM) as the basis for understanding the adoption of IT POS terminal deployment in banking services for investigating the end-user's security and trust of the POS terminals as perceived by the users or customers. POS systems initially found to be a cash register system, with a calculator machine and drawer where proof of purchase, receipt, or cash invoice can be issued (Dharma et al., 2019). As pointed out by Dharma et al.(2019), POS is described as form of IT device combining Hardware and Software components that facilitate transactions with customers, record inventory, and find present sales reports and profits over a time duration. In the context of the TAM framework, the decision to accept and adopt the deployment of POS terminals by commercial banks in Nigeria's financial services serves as the dependent variable, while the independent variables comprise how the users perceive the security and trust of the POS terminals.

Within the setting of the TAM system model, there are dependent variables as well as independent factors that contain the most characteristics of POS that make customers use it for banking and financial services. The choice to acknowledge and accept ADC (POS) as an adopted technology for performing banking and financial services now depends on these characteristics and factors, as depicted in Figure 1. Security and trust are complex and abstract. This research work will utilize the TAM model as the system for the utilization of ADC technology (POS) for banking and financial services for purposes that impact the setup of the security, trust configuration, and the results inferred from it. Figure 1 shows the adapted ATM model by the banks and the perceived security and trust in utilizing the POS terminals by the clients and customers. The behavioral intention test will determine how customers are attached and attracted to the POS technology with their perception effects of the adoption on the utilization of the POS terminals.

Figure 1: Technology Acceptance Model (TAM) Framework for POS Adoption



Source: Adapted from (Davis, 1985)

4. Methodology

This paper adopts a survey involving a carefully constructed questionnaire instrument and a partial least square structural equation modelling PLS-SEM) analysis approach. The researcher's judgment is necessary when determining and choosing the people, cases, or events that can provide the best information to meet the study's objectives (Saunders et al., 2019, p. 504). Analysis of the data through the PLS-SEM has become a standard tool in many disciplines of business research (Hair & Alamer, 2022). The research population for this project was drawn from commercial banks and telecommunication companies in Nigeria offering financial services through POS to their customers and users at large. Presently, there are 21 commercial banks in Nigeria, with their head offices in Lagos, Nigeria. Lagos has been the commercial hub of Nigeria. Fakoyejo (2021) confirmed that two telecommunication companies in Nigeria (Airtel (Smart Cash) and MTN (MoMo), with their head offices based in Lagos) have gotten Payment Services Bank (PSB) license approval from the CBN Nigeria.

4.1 Questionnaire design and survey approach

As a viable instrument for achieving the study goals and intentions, the first section of the survey involved information on respondents' demographic data including ages, incomes, genders, levels of education, places of residence, and job types. The second section of the survey used the Likert scale to collect respondents' satisfaction, loyalty to POS terminals, and the main factors that influenced their decision to

adopt this ADC called point-of-sale (POS) terminals as an alternative to the banking hall and other ADC. The research was thoroughly explained to respondents, and they were made aware that participation was voluntary. As earlier stated, the purpose of the research was to evaluate trust and security perceptions about POS Security Information Management. At any point during the process of data collection, 0 respondents had the option to leave if they felt uncomfortable or for any other reason(s). The survey was only open to those who were at least 18 years old.

Two fundamental objectives of the study are:

i. To determine how users/customers perceive doing financial services using POS whereas security and trust in personal information lie with POS Merchants.
ii. To examine what risks or challenges are users aware of concerning POS usage.

The accompanying research hypotheses to be tested in line with the conceptual framework of this study are as follows:

H_{01}: The acceptance of POS usage is independent of demographic characteristics.
H_{01a}: Gender has no influence on the adoption of the POS for banking and financial services.
H_{01b}: Education of the customer has no influence on the POS patronage.
H_{01c}: The customer's income influences the usage of the POS as an alternative to Banking Hall.
H_{01d}: Occupation of customer does not affect the usage of the POS.
H_{01e}: Customer's age has no positive influence on the acceptance of POS banking and financial services.
H_{02}: Customers and clients use POS for financial services due to its 24-hour daily availability.
H_{03}: The POS is good for customers and clients as it is adaptable at any time.
H_{04}: The flexibility of the POS makes the customers and clients use it for financial services.
H_{o5}: The customer considers utilizing the POS as no help is needed while using it.
H_{06}: The fondness for the POS stems from its error tolerance by the customers and clients.
H_{07}: Efficient use of POS devices makes it the choice for the customers and clients
$H_{08:}$ Customers' and clients' security and trust attitudes to use POS influence their behaviour.

4.2 Reflection on the survey

The data collection phase was very successful as the rate of return was overwhelming, and people were enthusiastic to participate in the survey. Seven hundred (700) questionnaires were distributed in both places, and five hundred and forty-seven (547) respondents returned their completed questionnaires. This gives approximately ninety-one percent (91.16%) of the respondents. Male participants/respondents the survey were 289, constituting about 52.8%, of the total participants/respondents. On the other hand, the female participants/respondents were 258 accounting for about 47.16% of the total participants/respondents. Table 3 shows the demographic data associated with the survey.

Table 3

Demography, Participant Responses for both Rural and Urban Locations

Variable	Category	Frequency	Percentage
Age (Years)	< 20	54	9.87
	20 – 30	168	30.7
	31 - 40	179	32.72
	40 - 50	100	18.28
	> 50	46	8.40
Total		**547**	**100**
Education	FSLC/ No Education	13	2.37
	WAEC/ GCE/ SSCE	107	19.56
	OND/ Diploma	155	28.33
	HND/ Bachelor degree	227	41.49
	Master /Ph.D. degree	45	8.22
Total		**547**	**100**
Income Per Month in (Naira)	<50,000	155	28.33
	50,001 – 150,000	197	30.01
	150,001 - 250,000	112	20.47
	250,001 – 350,000	56	10.23
	> 350 001	27	4.93
Total		**547**	**100**

Occupation	Student	99	18.09
	Civil Servant	123	22.48
	Corporate / Private Sector	178	32.54
	Business / Self Employed	147	26.87
Total		**547**	**100**
Gender	Male	289	52.8
	Female	258	47.16
Total		547	100
Location	Rural	221	40.40
	Urban	326	59.59
Total		**547**	**100**

5. Results and Discussion

For the purpose of investigating trust and security perception among users of POS, thirteen constructs have been carefully designed and assessed using the 5-Likert scale assessment levels of "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". The thirteen constructs include: CCIPOS: Confidential Information; COPOS: Collisions; CUISPOS: Understand Information Security; RCPOS: Risk Challenges Usage; SIARPOS: Security Information Rely; SAPOS: Security Around; TLPOS: Trust Loyalty; POSCSF: Critical Success Factor; POSFG: Financial Information System; POSBI: Behavioral Intention (Intention of Use); POSPEOU: Perceived Ease of Used; POSPU: Perceived Usefulness;

The result associated with the thirteen constructs revealed that all constructs scored 30% for ‘strongly agree’, and ‘agree’. The scores for ‘Neutrals ‘were between 10% and 20% for all the constructs. Those who strongly disagreed and disagreed were below 10% and 20% across all the constructs as presented in Tables 4 and Figure 2.

Table 4:

Table 4 shows the percentage of cumulative responses from respondents

547	POSFG	POSBI	POIPU	POSPEOU	POSCSF	CAPOS	TLPOS	SAPOS	R/C/POS	CCIPOS	CUISPOS	SIARPOS	COPOS
Strongly agree	36.2%	34.8%	41.2%	39.8%	37.1%	41.4%	42.7%	35.0%	36.1%	38.6%	38.6%	43.0%	34.9%
Agree	31.2%	37.6%	35.9%	33.0%	36.4%	33.6%	36.2%	37.3%	36.5%	34.5%	34.5%	38.2%	31.4%
Neutral	19.7%	17.2%	15.1%	17.2%	17.7%	15.6%	13.7%	16.7%	17.0%	15.6%	15.6%	13.7%	17.4%
Disagree	10.0%	8.0%	5.9%	7.7%	6.5%	7.1%	5.4%	6.7%	7.1%	8.3%	8.3%	3.8%	9.5%
Strongly disagree	3.1%	2.3%	1.9%	2.3%	2.3%	2.3%	1.9%	4.2%	3.3%	3.1%	3.1%	1.1%	6.8%
Total (N=547)	100.0%	100.0%	100.0%	100.0%	100.0%	100,0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: CCIPOS: Confidential Information; COPOS: Collisions; CUISPOS: Understand Information Security; RCPOS: Risk Challenges Usage; SIARPOS: Security Information Rely; SAPOS: Security Around; TLPOS: Trust Loyalty; POSCSF: Critical Success Factor; POSFG: Financial Information System; POSBI: Behavioural Intention (Intention of Use); POSPEOU: Perceived Ease of Used; POSPU: Perceived Usefulness

Figure 2:

The bar chart that shows the percentage of respondents in line with the research constructs

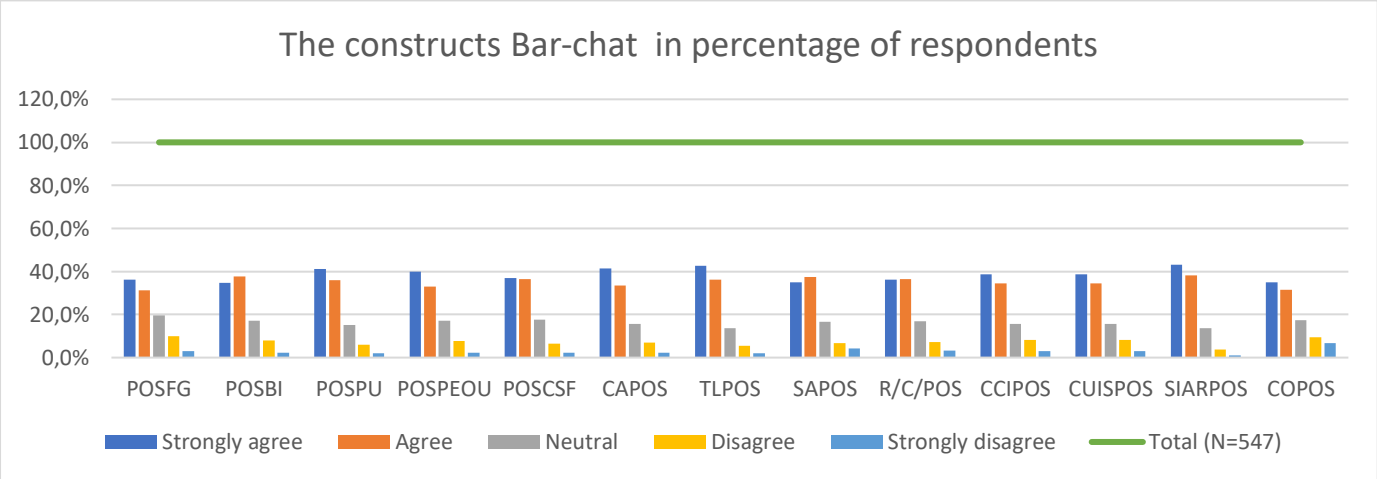


Table 5 provides a summary of the five direct hypotheses formulated based on demographic factors in this study (H_{01a}, H_{01b}, H_{01c}, H_{01d}, and H_{01e}). The hypotheses were tested using the path coefficient P-value, and the results indicate that gender and income were significant as p-value < 0,05 and had a direct effect on the behavior intention of use POS while education, occupation, and age were insignificant as the P value >0,05.

Table 5

Direct Effect or Relationship of Hypothesis Testing

Hypotheses	**Path Coefficient (ß)**	**Standard deviation (STDEV)**	**T statistics**	**P values**	**P<0,05**	**Decision**
H01a: Gender Versus POSBI	-0.191	0.062	3.057	0.002	TRUE	Supported
H01b: Education Versus POSBI	-0.058	0.037	1.561	0.119	FALSE	Not Supported
H01c: Income Versus POSBI	-0.100	0.044	2.248	0.002	TRUE	Supported
H01d Occupation Versus POSBI	0.052	0.035	1.515	0.130	FALSE	Not Supported
H01e: Age Versus POSBI	0.043	0.042	1.044	0.297	FALSE	Not Supported

The statistical tests of significance associated with the research hypotheses related to demographic factors reveal some of interesting results:

1. In assessing the influence of gender on the adoption of POS for banking and financial services, results show that Gender significantly influences behavioural intention of usage for POS. This is established with the results (ß = -0.191, t = 3.057, $p < 0.05$) and that the data provide strong support for the hypothesis. This is in accordance with related studies conducted by (Dahunsi & Omotayo, 2015; Venkatesh et al., 2003). Hence, gender has a significant effect on the intention to use POS
2. In considering whether education of the customer has influence on the POS patronage, result shows that Education does not significantly influences behavioral intention of usage for POS. This is established with the results (ß = -0.058, t = 1.561, $p > 0.05$) and suggest that education does not a significant role in influencing the intention to use POS. This result was in-line with related research study conducted by (Adeoti & Osotimehin, 2012; Omotayo, 2015).
3. In assessing whether customer's income influences the usage of the POS as an alternative to Banking Hall, results shows that Income strongly influences behavioural intention for the usage of POS. This is established with the results (ß =-0.194, t = 3.615, $p < 0.05$), indicating that income has a significant impact on the intention to use POS. The result is consistent with work of other researchers (Abegao Neto & Figueiredo, 2022; Okeke & Nkamnebe, 2018).
4. On the effect of customer's occupation on the acceptance of POS for banking and financial services, results show that Occupation indirectly affects behavioral intention of usage for POS. This is established with the results (ß = 0.052, t = 1,515, $p > 0.05$), indicating that occupation has indirect impact on the intention to use POS. This result is in agreement with the previous work of (Okeke & Nkamnebe, 2018; Tamajong, 2020; Worku et al., 2016)
5. On the account of Age as a demographic factor, the results given by (ß = 0.043, t = 1.044, $p > 0.05$) does not show a significant effect oof Age on behavioral intention for the usage for POS. Hence, the hypothesis is not supported. This implies that age does not play a significant role in influencing the intention to use POS. This is in consistent with the related research study by (Adeoti & Osotimehin, 2012; Meyer, 2008).

   In relation to the concepts of perceived usefulness and perceived ease of use, statistical test to assess the relationship between independent variables (perceived usefulness and perceived ease of use) and the dependent variable (behavioural intention of use) in the context of POS usage were carried out. Additionally, the moderating effects of security

and trust on the relationship were examined. The results of the tests of hypotheses, considering trust and security as moderators, are presented in table 6. Among the seven hypotheses tested, six were found to be significant, while only one was not supported and hence insignificant. The analysis showing the relationships are summarized in Table 6.

Table 6

The table that shows the Indirect Moderated Effect or Relationship for the hypothesis Testing

Hypothesis	Path Coefficient (ß)	Standard deviation (STDEV)	T statistics	P values	P<0,05	Decision
Availability and POSBI moderated by Trust and Security	0.100	0.027	3.640	0.000	TRUE	Supported
Flexibility and POSBI moderated by Trust and Security	0.103	0.026	3.900	0.000	TRUE	Supported
Adaptability and POSBI moderated by Trust and Security	0.023	0.023	0.991	0.322	FALSE	Not Supported
No Help and POSBI moderated by Trust and Security	0.153	0.023	6.730	0.000	TRUE	Supported
Error Tolerance and POSBI moderated by Trust and Security	0.187	0.031	6.059	0.000	TRUE	Supported
Efficient and POSBI moderated by Trust and Security	0.114	0.024	4.649	0.000	TRUE	Supported
POSBI Versus Trust and Security	0.627	0.031	19.927	0.000	TRUE	Supported

In addressing the hypotheses of whether customers and clients use POS for financial services due to its 24-hour daily availability, it was observed that Trust and Security moderate the relationship between perceived usefulness (**Availability**) and behavioral intention of use with statistics (ß = 0.100, t = 3.640, p < 0.05). It is supported by the research work of (Akerejola et al., 2018; Williams et al., 2018) on the factors of POS widely adoption in Nigeria. The hypothesis is supported, thus indicating that trust and security play a significant moderating role in the relationship between perceived usefulness and behavioral intention of use. In addressing the hypothesis of whether the POS is good for the customers and clients as it adaptable at any time, it was observed that Trust and Security do not moderate the relationship between perceived usefulness (**Flexibility**) and behavioral intention of use with the statistics (ß = 0.103, t = 3.900, p < 0.05). This results is in consistent with research work of (Cruijsen & Mirjam, 2006). The associated hypothesis is not supported, thus indicating that trust and security do not have a significant moderating effect on the relationship between perceived usefulness and behavioral intention of use.

In addressing the hypothesis of whether the adaptability of POS makes the customer and client use it for financial services, results show that Trust and Security do not moderate the relationship between perceived usefulness (**Adaptability**) and behavioral intention of use with the statistics (ß = 0.023, t = 0.991, p > 0.05). This is in consistent with the research of (Eneeji et al., 2019). The results show that the hypothesis is not supported, suggesting that trust and security do not have a significant moderating effect on the relationship between perceived usefulness and behavioral intention of use. On the consideration of the hypothesis of whether customer utilizing the POS as No Help is needed while using it, results show that Trust and

Security moderate the relationship between perceived ease of use (**No Help**) and behavioral intention of use with statistics (ß = 0.153, t = 6.730, p < 0.05). This work is in consistent with (Nworie & Okafor, 2023). The hypothesis is supported, suggesting that trust and security play a significant moderating role in the relationship between perceived ease of use and behavioral intention of use.

On whether the fondness for POS stems its error tolerance by the customers and clients results show that Trust and Security do not moderate the relationship between perceived ease of use (**Error Tolerance**) and Behavioural Intention with statistics (ß = 0.187, t = 6.059, p < 0.05). The research conducted by (Lee et al., 2014; Lidiya, 2020) indicated that result was supported by other researchers works. These results show that hypothesis is not supported, indicating that trust and security does not have a significant moderating effect on the relationship between perceived ease of use and behavioral intention of use. On whether the efficient use of POS devices makes it the choice for the customers and clients, results show that Trust and Security moderate the relationship between perceived ease of use (**Efficient**) and behavioral intention of use with statistics (ß = 0.114, t = 4.649, p < 0.05). This result is in consistent with the research work conducted by (Williams et al., 2018). The result show that the hypothesis is supported, thus suggesting that trust and security play a significant moderating role in the relationship between perceived ease of use and behavioral intention of use.

Finally, in investigating whether customers' and clients' security and trust attitude to using POS influence their behaviour, results show that Trust and Security influence the behavioral intention of use of POS technology. The hypothesis is supported having the statistics (ß = 0.627, t = 19,927, p < 0.05). This work is in consistent with (Devi Juwaheer et al., 2012) related research work.

Summarily, these results reveal that the majority of the hypothesis tested moderating through trust and security has a significant effect while only adaptability shows insignificant moderating effects on the relationship between perceived usefulness, perceived ease of use, and behavioral intention of POS usage. On the contrary, adaptability shows insignificant moderating effects on the relationship between usefulness, perceived ease of use, and behavioural intention of POS usage. Furthermore, it was discovered that the majority of survey participants agreed that customer Security Information Management (SIM) is critical for the cashless economy, with the POS playing a key role in facilitating its implementation in Nigeria. Physical attacks, malware and/or viruses, phishing, skimming, and other nefarious activities

plague the POS terminal. As they do to any other electronic payment system. As a result, it has become a target for criminals.

6. Conclusion

Customer Security Information Management is critical to the successful implementation of a cashless economy in Nigeria. It aids the prevention of fraud, increases customer trust, ensures regulatory compliance, prevents identity theft, reduces financial losses, and promotes economic growth. Nigeria can foster a safe and thriving cashless ecosystem by prioritizing customers. The area of Point-of-Sales Security Information Management (POS-SIM) is an important area of research in the field of Information Security, because POS systems are used widely in the banking and financial industries and cyberattacks on these systems are becoming more sophisticated.

From the analysis of the survey data, it is evident that customer perceives using Point-of-Sales (POS) systems for banking and financial services as a means to enhance the flexibility and accessibility of their daily transactions. A significant is in respect to the security of their data and information with POS operators. The inherent risks endowed with POS terminals make it a serious challenge to the customers because the transactions are a street-based business which expose the customers that patronized them to various challenges that impact security and trust. On the totality, customers use the POS for banking and financial services because of demographic factors such as gender, income, occupation, and education. Furthermore, customers prefer POS terminals to banking halls because it provides them with availability, flexibility, ease of use, error tolerance, no help, and service efficiency.

Some potential areas for further research in POS security information management (SIM) could include:

i. Comparing different types of POS systems (e.g. traditional terminals, mobile-based solutions, cloud-based systems) to assess Security and Trust variations. This would provide insights into various POS technologies' security strengths and weaknesses.
ii. Determining the economic impact of security breaches on businesses and the economy as a whole.
iii. Evaluating the costs of POS system vulnerabilities, such as financial losses, reputational damage, legal liabilities, and customers' influence. This would provide a thorough understanding of the benefits of investing in POS system security.

Reference

Abegao Neto, F. L., & Figueiredo, J. C. B. de. (2022). Effects of age and income moderation on adoption of mobile payments in Brazil. *Innovation & Management Review*. https://doi.org/10.1108/INMR-06-2021-0109

Acha, I., Kanu, C., & Agu, G. (2017). Cashless Policy in Nigeria : The Mechanics , Benefits and Problems Innovative Journal of Economics and Financial Studies Cashless Policy in Nigeria : The Mechanics , Benefits and Problems. *Innovative Journal of Economics and Financial Studies*, *1*(January), 28–38.

Adeoti, O., & Osotimehin, K. (2012). Adoption of Point of Sale Terminals in Nigeria. *Research Journal of Finance and Accounting*, *3*(1), 1–6. https://www.academia.edu/1291578/Adoption_of_Point_of_Sale_Terminals_in_Nigeria?email_work_card=title

Adesemowo, A. K. (2021). Towards a conceptual definition for IT assets through interrogating their nature and epistemic uncertainty. *Computers & Security*, *105*, 102131. https://doi.org/10.1016/J.COSE.2020.102131

Akerejola, W., Olalekan U, A., Timothy, S., Ayo, C. K., Ukpere, W. I., Dourish, P., Okpara, E. U., Ohikhena, P., & Emenike, P. O. (2018). Combating EFraud on Electronic Payment System. *International Journal of Academic Research in Business and Social Sciences*, *4*(3), 2801–2806. https://doi.org/10.6007/ijarbss/v9-i1/5370

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, *37*(3), 99–110. https://doi.org/10.1016/j.ijinfomgt.2017.01.002

Cruijsen, C. van der, & Mirjam, P. (2006). DNB Working Paper. *DNB Working Paper*, *276*(50), 289–295. http://www.rug.nl/staff/l.spierdijk/panzar_rosse.pdf

Dahunsi, O., & Omotayo, F. (2015). Factors Affecting Adoption of Point of Sale Terminals by Business Organisations in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, *Oct 2015*,(April 2020). https://doi.org/10.6007/IJARBSS/v5-i10/1856

Devi Juwaheer, T., Pudaruth, S., & Ramdin, P. (2012). Factors influencing the adoption of internet banking: a case study of commercial banks in Mauritius. *World Journal of Science, Technology and Sustainable Development*, *9*(3), 204–234. https://doi.org/10.1108/20425941211250552

Dharma, S., Yuhelmi, Y., & Trianita, M. (2019). The Extension of TAM Model in the Use of Point of Sale (Pos) in Minimarkets in Padang, Indonesia. *The First Economics, Law, Education and Humanities International Conference*, *3*(14), 83–96. https://doi.org/10.18502/kss.v3i14.4300

Emeka, O., Agha, N., & Zephaniah, C. (2019). Conceptualizing a Cashless System for the Retail Banking Sector of an Emerging Economy: Policy Implications for the Nigerian Apex Bank. *African Research Review*, *13*(4), 162. https://doi.org/10.4314/afrrev.v13i4.15

Eneeji, S., Udie, M., Eyong, W., & Chimdike, K. (2019). A Study of Electronic Banking Fraud, Fraud Detection and Control. *International Journal of Innovative Science and Research Technology*, *4*(3), 1–5. www.ijisrt.com708

Fakoyejo, O. (2021, November 5). Airtel, MTN get licenses to operate as Payment Service Banks - Ripples Nigeria. *Ripples Nigeria, Business*. https://www.ripplesnigeria.com/just-in-airtel-mtn-get-licenses-to-operate-as-payment-service-banks/

Fetherston, A. B. (1994). Developing a Conceptual Framework for Peacekeeping. In *Towards a Theory of United Nations Peacekeeping* (pp. 141–161). Palgrave Macmillan UK. https://doi.org/10.1007/978-1-349-23642-8_6

Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, *1*(3), 100027. https://doi.org/10.1016/j.rmal.2022.100027

Lee, H.-J., Lee, Y., & Won, D. (2014). Protection Profile for PoS (Point of Sale) System. In N. Woungang (Ed.), *Mobile, Ubiquitous, and Intelligent Computing* (pp. 495–500). Springer. https://doi.org/10.1007/978-3-642-40675-1_74

Lidiya, B. (2020). *THE EFFECT OF POINT OF SALE (POS) SERVICE QUALITY ON CUSTOMER SATISFACTION: THE CASE OF COMMERCIAL BANK OF ETHIOPIATitle* [Addis Ababa University]. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://etd.aau.edu.et/bitstream/handle/123456789/24553/Lidiya Bezabih.pdf?sequence=1&isAllowed=y

Meyer, J. (2008). The Adoption of New Technologies and the Age Structure of the Workforce. *SSRN Electronic Journal*, *08*. https://doi.org/10.2139/ssrn.1210162

Nworie, G. O., & Okafor, T. G. (2023). A Literature Review on the Challenges of the Use of Point of Sale (POS) Terminals in the Nigerian Banking System. *International Journal of Academic Information Systems Research (IJAISR)*, *7*(February), 2. https://www.bing.com/ck/a?!&&p=b4c6e0d271b4864bJmltdHM9MTY4MjU1MzYwMCZpZ3VpZD0yMmI2MDg4NS0wZWZjLTY4YjEtMjIzNC0xYjg1MGY4ZTY5MjAmaW5zaWQ9NTIyNQ&ptn=3&hsh=3&fclid=22b60885-0efc-68b1-2234-1b850f8e6920&psq=A+Literature+Review+on+the+Challenges+of+the+Use+of+Po

OECD. (2020). *Digital Disruption in Banking and its Impact on Competition*. https://www.oecd.org/daf/competition/digital-disruption-in-financial-markets.htm

Okeke, T. C., & Nkamnebe, A. D. (2018). *The Mediating Role of Perceived Trust on Consumer Adoption of Point of Sale (POS) e-Payment System in Awka , Anambra State*. *Vol 13*, _(Number 1), 1–12. https://www.researchgate.net/publication/331023590_The_Mediating_Role_of_Perceived_Trust_on_Consumer_Adoption_of_Point_of_Sale_POS_e-Payment_System_in_Awka_Anambra_State

Omotayo, F. (2015). Factors Affecting Adoption of Point of Sale Terminals by Business Organisations in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, *5*(10), 1–6. https://doi.org/10.6007/IJARBSS/v5-i10/1856

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education Limited. https://www.pearson.com/en-gb/subject-catalog/p/Saunders-Research-Methods-for-Business-Students-8th-Edition/P200000005358/9781292208800

Tamajong, C. F. (2020). *E-banking Acceptance: An empirical study of Cameroonian Customers* [Cardiff Metropolitan University]. https://doi.org/10.25401/cardiffmet.13127882.v1

Venkatesh, V., Morris, M., Davis, G. B. ., & Davis, F. (2003). *User Acceptance of Information Technology : Toward a Unified View Author (s): Published by : Management Information Systems Research Center , University of Minnesota*. *27*(3), 425–478.

Whitteker, W. (2014). Point of Sale (POS) Systems and Security. In *SANS Institute*. https://sansorg.egnyte.com/dl/KPil6TbQZq

Williams, A., Olalekan U, A., & Timothy, S. (2018). Consumer trust and adoption of Point Of Sales of selected business organisations in Lagos State Nigeria. *International Journal of Applied Science - Research and Review*, *05*(02), 1–14. https://doi.org/10.21767/2394-9988.100069

Worku, G., Tilahun, A., & Tafe, M. (2016). The Impact of Electronic Banking on Customers ' Satisfaction in Ethiopian Banking Industry (The Case of Customers of Dashen and Wogagen Banks in Gondar City). *Journal of Business & Financial Affairs*, *5*(2). https://doi.org/10.4172/2167-0234.1000174