

Security and Privacy Dimension as Predictor of Internet Banking E-Service Quality on Customer Trust

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Abstract:- Information Technology is driven by the use of the Internet, which plays a major role in improving the security and privacy of the e-service quality. Further improvements in process related to the banking industry are seen, however customers have expressed their displeasure on security, privacy and trust. These led to customers unwillingness to transact using Internet banking. In this research, effect of security and privacy dimension as a predictor of Internet banking e-service quality on customer trust was examined using E-S-QUAL model and Interpersonal trust model. Using a quantitative research approach, a structured questionnaire was used in data collection in this survey. SPSS and PLS-SEM were used in data analyses. The result shows that two variables of e-service quality have significant positive effect on the customer trust with privacy having the highest level of effect/significance. The result also shows that it has a substantial coefficient of determination and good predictive relevance of the model of the study. This study found that Internet banking service is critical to customers' trust. It has concluded that customers' concern deals with the technical specifications of a website's security, trust and payment methods, it also incorporates the degree to which the customer believes the site is safe from intrusion and personal information is protected. It was recommended that efficiency, privacy and security issues of Internet banking e-service quality should be addressed by banks in order to ensure efficient service are being delivered to the customers.

Keywords:- Internet Banking, Internet Banking Security (IBS), Internet Banking Privacy (IBP), Service Quality, Customer Trust.

I. INTRODUCTION

In recent years, the introduction of powerful Internet technologies has altered the global commercial landscape. The global market has grown borderless, and businesses may now expand their operations to any part of the globe without having to have a physical presence there. Advances in Internet technology also enable businesses to operate 24 hours a day, 7 days a week, virtually 365 days a year (Abdallah *et al.*, 2017).

Internet banking has grown in popularity in recent years because it provides a convenient, quick, and low-cost way for customers to conduct their financial transactions via a web interface. However, use of the Internet as a banking tool has

been limited by a number of issues. One of the most significant issues confronting the sector, like with most other e-commerce companies, is a lack of client trust Al-khalifa, (2016) find that trust is an important ingredient to accelerate the growth of online applications.

Understanding the nature of consumer trust and the elements that influence it, according to Solomon and Flores (2016), gives crucial hints for its adoption. There are numerous qualities associated with the website that are utilized to establish confidence, such as efficiency, availability, fulfilment, security, privacy, and so on. One of the most essential elements that impact client trust is the security procedures utilized by websites. According to Abubakar and Bao (2018), confidence in a physical banking environment is strongly dependent on the consumer's security and privacy. As a result, in virtual banking, security and privacy play a critical role in establishing confidence.

According to Ahmad and Azubi (2015), the lack of direct engagement in the virtual world alters the foundation on which trust is built. The virtual world is more complicated, and there are more opportunities for exploitation. Because the level of uncertainty in virtual banking is higher, trust is a vital component of this environment. Although the percentage of Internet banking usage in Nigeria has expanded dramatically in recent years, people are still hesitant to utilize it for their financial operations. Trust is one of the most important aspects of Internet banking.

Quality service begins with a comparison of what customers expected the provider to supply against what the provider actually provided. In this regard, quality service might be defined as the proportion of service effectiveness to customer expectations. As a result, promoting great service entails effectively meeting a user's wants and expectations (Yusuf & Bala, 2015). Following the advent of information technology, the Nigerian banking sector is working in a generally stable environment. Customers, on the other hand, have indicated their dissatisfaction with efficiency and privacy concerns, and a lack of confidence is linked to a refusal to use Internet banking (Alabar, 2011). In most cases, the Internet banking site is not safe enough for financial and personal information to be divulged, therefore clients are hesitant to do banking transactions. As a result, in Nigeria, the use of information technology in banking operations has become a source of worry for all banks doing business in the nation, as well as a requirement for global competition and service quality (Chaouali *et al.*, 2016). These concerns

(uncertainty, security and efficiency concerns, lack of confidence, and privacy concerns) generated questions about the impact of the quality of Internet banking services on client trust.

II. REVIEW OF RELATED LITERATURE

According to Mukherjee and Nath (2013), Internet banking is a sort of banking in which customers may use telecommunication networks to accomplish various financial activities such as monitoring account status and making various forms of payments.

Customers can use Internet banking to conduct their regular transactions regardless of their location. Bill payment and checking the balance are two of the most popular internet banking activities (Fox, 2016). Internet banking, according to Bernstel (2010), is the usage of various banking services through the Internet. Users must connect on to the bank's web page using a computer browser and through the incorporation of a dedicated server in the bank in order to utilize such services. On the other hand, users in the personal computer banking system need fill out their personal information offline before submitting it to the bank's server, whereas Internet banking does not require access to the bank's private networks.

A. Concept of security of e-service quality in Internet banking

The security dimension, according to Ojasalo (2010), is the absence of danger, risk, or uncertainty. Physical security (Will I be robbed at the ATM?), financial security (Does the corporation know where my stock certificate is?), and secrecy (Are my business transactions with the company private?). It covers the technical aspects of a website's security, trustworthiness, and payment processes. This dimension also takes into account the company's reputation, trust, and overall secrecy among customers and employees involved in the communication process (Al-Tarawneh, 2012).

B. Concept of privacy of e-service quality in Internet banking

The privacy component, according to Malhotra, Parasuraman, and Zeithalm (2005), covers the technical requirements of a website's security, trust, and payment mechanisms. This dimension also takes into account the company's reputation, trust, and overall secrecy among customers and employees involved in the communication process. The extent to which the client feels the site is secure and personal information is kept private. The extent to which the site's order delivery and item availability promises are kept.

C. Service quality and E-service quality

Service, according to Zeithaml, Bitner, and Gremler (2006), is defined as "deeds, procedures, and performance." Quality has been broadly defined by Lee, Kim, Yong, and Sagas (2010) as "fitness for use" and those product attributes that fulfill consumer demands and hence offer customer

satisfaction. Perceived service quality was described by Parasuraman, Zeithaml, and Berry (1988) as "a worldwide assessment, or attitude pertaining to the superiority of a service." Many models have been created to evaluate customer perceptions of service quality, and research has demonstrated that service quality (ServQual) is an effective and reliable method for evaluating service quality across service sectors (Bebko, 2000). (Martinez & Martinez, 2010). E-service, according to Rowley (2006), refers to actions, efforts, or performances that are mediated by information technology. In general, it's an interactive, content-centered, Internet-based customer service that's driven by consumers and connected with service providers' technology and processes to deepen the customer-provider connection (Zeithaml et al., 2000).

D. Customer trust

Despite the fact that an online service context entails a remote contact between the user and the supplier and eliminates human intermediates, trust in an online service context may not be significantly different from trust in a traditional service environment. A user's capacity to offer quick feedback, as well as understand and manage the use of an online system, is hampered by a distance connection (Yoon, 2002). Because it takes place in a more unpredictable environment, it lacks a human interface in online transactions, and it represents more consumer risk owing to the absence or complexity of contracts, trust is more necessary in online exchanges than in traditional exchanges.

Trust is defined as the readiness to rely on a partner in whom one has faith. Trust is the word for the trust and belief that a consumer has in a company and believes that what he or she expects should be provided (Daniel, 2016). Actually, trust is a relationship that binds a client to a business. Trust exists amongst an organization's personnel as well. In international and multicultural organizations, a higher degree of confidence in one another leads to productive interactions, which in turn leads to long-term advantages for the businesses (Daniel, 2016). Basically, Trust plays an important role in e-business. Because at e-market privacy and security are keys elements to develop trust (Yousafzai, Pallister & Foxall, 2013). In order to determine the relationship between service quality and customer trust, Interpersonal trust in commercial relationships model will be used as the underpinning theory for the dependent variable which is trust.

E. E-Service quality model

Parasuraman *et al.*, (2005) proposed E-S-Qual and E-RecS-Qual scales for measuring e-service quality. E-S-Qual scale is a leading model for the measurement of e-service quality just as ServQual in service quality. Parasuraman *et al.*, (2005) framework described the one out of the four e-service quality dimensions as privacy: protects customer information from third party. Security as described Surjadata *et al.*, (2003) represents the level of security and protection of the site, which is the degree to which the site is safe for transaction.

Table 1: Review of the Dimensions of E-service Quality

Authors	Dimensions	Model
Joseph <i>et al.</i> , (2004)	Efficiency, Contact and Customization	E-ServQual
Wolfinbarger and Gilly (2002; 2003)	Website design, reliability, security, and customer service.	E-service
Zeithaml <i>et al.</i> , (2000)	Security, communication, reliability, responsiveness and delivery.	e-SERVQUAL
Madu and Madu (2002)	Performance, features, structure, aesthetics, reliability, serviceability, security and system integrity, trust, responsiveness, service differentiation and customization, Web store police, reputation, assurance and empathy.	E-service
Surjadaja <i>et al.</i> , (2003)	Security, interaction, responsiveness, information, reliability, delivery, and customization.	E-service
Santos (2003)	Ease of use, appearance, linkage, structure, content, efficiency, reliability, communication, security, incentive and customer support.	E-service quality
Field <i>et al.</i> (2004)	Website design, reliability, security, and customer service.	E-service
Yang and Fang (2004)	Responsiveness, reliability, credibility, competence, access, courtesy, communication, information, responsiveness and website design.	E-service
Parasuraman <i>et al.</i> (2005)	Efficiency, availability, fulfillment and privacy	E-S-QUAL
	Responsiveness, Compensation, Contact	E-RecS-QUAL
Cristoal <i>et al.</i> (2007)	Website design, customer service, assurance and order management.	E-service
Sangeetha, (2012)	ATM, Telephone banking, Internet banking, Call center services, Queue systems, Perceived price, Core service	TISQ

Source: Generated by the Researcher, 2021

F. Other related studies

In both developed and developing nations, several research have been conducted on the link between Internet banking usage and service quality. Agboola (2001) investigated the influence of computer automation on banking services in Lagos and determined that online banking has significantly enhanced the services provided by several banks to their Lagos consumers.

According to Ibrahim *et al.* (2013), a number of banking institutions have swiftly deployed internet financial because they recognize that delaying internet financial deployment would result in significant cost savings, which will reduce competition in terms of service quality and accessibility. Many Malaysian banks will provide online banking services such as bank accounts, cash transfers, the opening of new accounts, credit card and loan payments, specialized consulting, promotions, and reward redemptions. A major portion of the trust beliefs identified as a consequence of the study is linked to contentment, trust, compassion, and competency.

Abdallah (2017) interprets e-quality determinants as trust, i.e., trusting beliefs, and intents to repurchase as trusting intentions, in a review of studies on online trust. The SERVQUAL methodology is used to investigate the impact of perceived e-service quality on customer trust, and three dimensions are identified: tangibles, empathy, and a combined dimension of dependability assurance responsiveness, all of which have a major impact on trust. According to studies, the most important factor of consumer pleasure is trust.

According to Alalwan *et al.*, (2016), site dependability, security, and performance consistency are vital in creating confidence towards an online retail organization in the

context of Internet commerce. Attitudes regarding online banking are heavily influenced by trust. Thus, trust may be described as the perception that a bank, from whom a consumer receives a loan, conducts business with a customer in a responsible, trustworthy, and competent manner, as well as acting in a manner that is not injurious to the client in order to achieve its own interests (Alalwan *et al.*, 2016).

The research by Ling *et al.*, (2016) reveals that security/privacy risk is a possible loss due to fraud or a hacker intrudes the security of an online bank user. Where web design and content, security and privacy, convenience and speed are the major factors that influence customer satisfaction and trust in Internet banking, service quality, web design and content, convenience and speed are the major factors that influence customer satisfaction and trust in Internet banking. Trust and distrust are distinct constructs, and traditional e-retailing trust had a nomological network that highlighted several distrust experiences that had a negative impact on the intention to use online banking. Trust is the most important influencing factor on a user's willingness to transact money and personal sensitive information over the internet.

According to Chaouali *et al.*, (2016), in order for a client to trust Internet banking, he or she must be convinced that the transactional medium is safe and that any information submitted to such web sites is not seized or handed to a third party. According to the study, trust is a critical aspect of Internet banking because of the "spatial and temporal separation" between the customer and the bank. Because transactions carried out online frequently do not involve a simultaneous money transaction, the absence of direct physical contact creates the nature of service delivery as a lack of trust in Internet banking.

III. CONCEPTUAL FRAMEWORK

As mentioned in the previous section, Parasuraman, *et al.* (2005) proposed E-S-QUAL and E-RecS-QUAL scales for measuring e-service quality. E-S-QUAL scale is a leading model for the measurement of e-service quality just as SERVQUAL in service quality. This study adapts one of the four-service quality dimension of E-S-QUAL proposed by Parasuraman, *et al.* (2005) and introduce security/system integrity from the work of Madu and Madu (2002), and Surjadaja *et al.*, (2003).

Parasuraman *et al.*, (2005) framework described the four e-service quality dimensions as efficiency: the ease and speed of accessing and using the site, fulfillment: the extent to which promises made by the site are fulfilled, system availability: the correct technical functions of the site, and privacy: protects customer information from third party. Security as described Madu and Madu (2002) represents the level of security and protection of the site, which is the degree to which the site is safe for transaction. Figure 1 is the original theoretical frame work as developed by Jahromi *et al.*, (2011), while figure 2 is the designed conceptual research framework for this study.

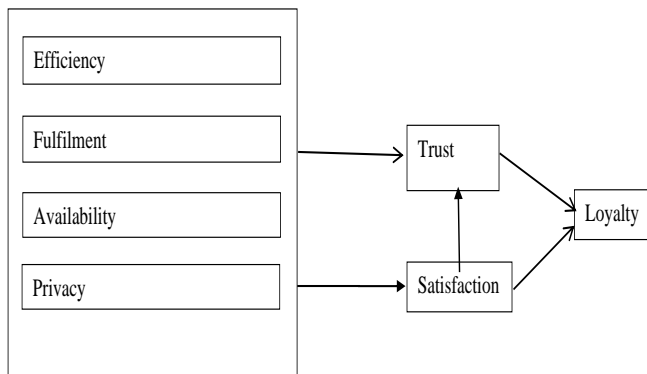


Fig 1: E-service Quality Model
Source: Adopted from Jahromi *et al.*, (2011).

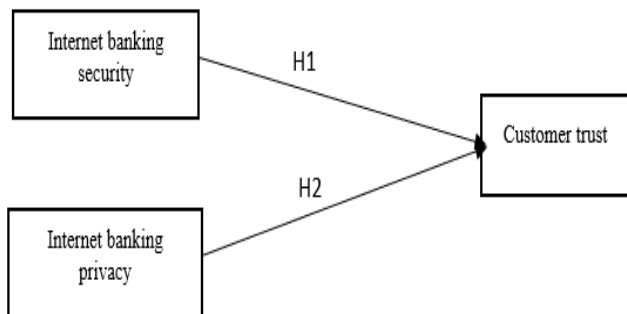


Fig 2: Conceptual Research Framework

A. Hypotheses development

H1: Internet banking security has significant effect on customer trust:

The impact of online banking security on customer trust might be beneficial or bad. In research by Ally & Toleman (2005) and Chellappa (2002), empirical data shows that felt security has the ability to favorably enhance trust. It's possible, based on their research, that Internet banking security has a major impact on client trust.

H2: Internet banking privacy has significant effect on customer trust:

Internet banking privacy was discovered to have an essential part in creating consumer trust by Yousafzai *et al.*, (2005) and Mohammed *et al.*, (2016). The relevance of privacy and its influence on trust is also examined in the study by Belanger *et al* (2002). However, according to research by Chellappa (2002), client trust in internet banking privacy is lower. It may be assumed, based on Yousafzai *et al.*, (2005) and Belangar *et al.*, (2002), that Internet banking privacy has a major impact on customer trust.

B. Research Gap

The literature review indicates that several researches have been conducted on Internet banking but limited researches have been conducted on Internet banking in respect to the dimensions of e-service quality on customer trust. Jahromi *et al.*, (2011) underpinned this research thereby adding an independent variable of Internet banking security to the one of the already existing four variables of the E-S-QUAL framework. A hypothesis would be developed and tested which would signify the existence of a strong relationship between the added variable and customer trust. The study would try in separating security and privacy as two different variables in the same framework. This would be a significant contribution as it would show that the two dimensions can be measured independently and a valid result can be obtained. Therefore, this would seek to fill the research gap created in academia and the findings of the study will be the researcher's contribution to the body of knowledge. Also, jahromi *et al* (2011) uses trust as a mediating variable while this research uses trust as dependent variable.

IV. RESEARCH METHODOLOGY

This research adopted a cross-sectional survey study in order to assess the nature of the relationship between the variables of the study, and which involves the study of specific group unit at a time and drawing conclusion based on circumstances of the group (Zikmund *et al.*, 2010). For the purpose of this study, the population comprises of all the 28,310 students of the four selected Bauchi state tertiary institutions which are Abubakar Tafawa Balewa University Bauchi (ATBU), Abubakar Tatari Ali Polytechnic Bauchi (ATAP), Bauchi state college of Agriculture and Aliko Dangote College of Nursing Sciences. Table 1, shows the total target population of the study and the total number students from the four institutions.

Table 2: Population of the Study

S/No	Institutions	No. of Students	Source	Period
1	ATBU	19,078	ATBU Registry	2018
2	ATAP	6,803	ATAP Registry	2018
3	Col. of Agric	2,272	Col. of Agric Registry	2018
4	Col. Of Nurs. & Mid.	157	Col. Of Nurs. Registry	2018
	Total	28,310		

Source: Registry, 2021

Therefore, the sample size was obtained based on the table provided by Krejcie and Morgan, (1970). According to the table attached. A population of up to 30,000 should have a sample size of 379 samples. Based on the nature of the population of this study, cluster sampling was adopted in selecting the sample (Singhry, 2018). Then an element is being picked from each cluster by means of convenient sampling method. Similarly, Creswell (2009) was in support of this view that cluster is one of the efficient techniques which ensures that sample is distributed in the same manner as the population of the study based on the cluster criteria followed. Table 2, clearly indicates the total number of the samples chosen to represent each institution.

Table 3: Sample Distribution

S/No	Institutions	No. of Students	Sample	Percentage
1	ATBU	19,078	254	67%
2	ATAP	6,803	91	24%
3	Col. Of Agric	2,272	30	8%
4	Col. Of Nus. & Mid.	157	4	1%
	Total	28,310	379	100%

Source: Generated by the Researcher, 2021

A. Data Collection

A questionnaire survey instrument was distributed to a sample of 379 respondents across the four the institutions chosen. Total number of about 350 (92%) were retrieved. After the data collection, the questionnaires were coded into SPSS software and only 330 (87%) were retained for analysis. This response rate was considered adequate for this research based on the argument by Creswell (2009) that a response rate of 30% is acceptable for survey research. Similarly, the response rate was adequate based on the recommendation that sample size should be 5 to 10 times the number of variables (Sekaran & Bougie, 2010). The analysis was also conducted using IBM-SPSS software version 22 and SmartPLS software version 3.0.

B. Data Collection Instrument

The questionnaire was adapted from the study of Parasuraman *et al.*, (2005); Surjadaja *et al.* (2003); Madu and Madu, (2002) and Ibrahim *et al.*, (2013). It comprised of two sections. The first section has about six items asking on the demographic profile of the respondents such as gender, age range, institutions, level and duration of usage of e-banking services as well as frequency of usage. The second section has about six variables which include: internet banking availability, internet banking efficiency, internet banking fulfillment, internet banking privacy, internet banking security and customer trust. A number of questions were asked on a five-point likert scale ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree.

C. Instrument Reliability and Validity

In order to ensure validity of the items, a step-by-step process of assessing the validity of the whole items was conducted starting with the content validity and then construct validity. Each of these measures facilitates the procedure of having a valid research instrument.

Reliability of a measurement instrument indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the instrument. The reliability of a measure is an indication of the stability and consistency with which the instrument measures the concept and helps to assess the goodness of a measure (Sekaran & Bougie, 2010). In this study, the items' reliability was measured using internal consistency of the items in Smart PLS. The loadings of all the items indicate a strong reliability as well as goodness of the measurement instrument.

Content validity ensures that the measure includes an adequate representative set of items that have the overall picture of the concept under investigation, while construct validity assessed how well the results obtained from the use of the measurement instrument fit the theories around which the test is designed to measure (Sekaran & Bougie, 2010). These are achieved through convergent validity and discriminant validity. Smart PLS application was used to assess both as indicated in chapter four. The result indicates that both convergent validity and discriminant validity was good enough based on the rule of thumb. Face validity was also assessed through experts' view of the instrument. Many scholars' views were sought on how to make sure that the items are simple, clear and understandable, and also within the context of the study.

D. Results Presentation

Table 4: Demographic Variables

Demographics	Category	Frequency	Percentage
Gender	Male	219	66.4%
	Female	111	33.6%
	Total	330	100%
Age range	16-20yrs	90	27.3%
	21-25yrs	140	42.4%
	26-30yrs	74	22.4%
	Above 30	25	7.6%
	Total	330	100%
Institution	ATBU	208	63.0%
	Col. Of Agric	28	8.5%
	Col. Of Nus & Mid	4	1.2%
	ATAP	89	27.0%
	Total	330	100%
Year of Study	Year1	39	11.8%
	Year2	117	35.5%
	Year3	52	15.8%
	Year4	43	13.0%
	Year5	79	23.9%
	Total	330	100%
Internet Banking Service Usage	Less than 1yr	139	42.1%
	1-3yrs	124	37.6%
	Over 3yrs	66	20.0%
	Total	330	100%
Internet Banking Service Frequent Use	Once in a week	172	52.1%
	Once in two weeks	77	23.3%
	Once in a month	80	24.2%
	Total	330	100%

Source: Extracted from IBM SPSS output, 2021

Based on the result as shown on table 4, 219 of the respondents were males representing 66.4% while 111 females were 33.6%. In terms of age, 140 of the respondents falls between the age brackets of 21 – 25 years with 42.4%, those between 16 - 20 years stands at 27.3%, closely followed by 26 – 30 years with 22.4% while those above 30 years were the least representing 7.6%. Analyzing the result based on institutions, ATBU has the highest number of respondents with 208 which stands about 63.0%, followed by 89 from ATAP with 27.0%, College of Agriculture 8.5% and College of Nursing and Midwifery 1.2%. The year of study of the respondents ranges from the year one to year five. The

respondents from year two with 140 which stands about 35.5% is the highest, followed by those in year five with 23.9%, then year three students with 15.8% then year four students with 13.0% while year one students were the least with 11.8%. Internet banking service usage was also assessed. Those with less than a year usage was 42.1%, between 1 – 3years were 37.6% and those with over 3years were 20.0%. Regarding the question on the duration of internet banking frequent use, about 52.1% have been using internet banking at least once a week, while 23.3% have been utilizing internet banking at least once in two weeks, and 24.2% patronize the technology at least once a month.

Table 5: Internet banking Security Questionnaire Items

S/no	Questionnaire Items	SD(1)	D(2)	U(3)	A(4)	SA(5)	Mean	St D
IBS1	Internet banking has mechanisms to ensure the safety of its users' information.	2 0.6%	2 0.6%	6 1.8%	192 58.2%	128 38.8%	4.34	0.61
IBS2	Internet banking has sufficient technical capacity to ensure user's information cannot be modified by hackers	1 0.3%	2 0.6%	2 0.6%	162 49.1%	163 49.4%	4.47	0.58
IBS3	Internet banking services does not cause financial risk	1 0.3%	4 1.2%	0 0.0%	140 42.4%	185 56.1%	4.53	0.60
IBS4	Making e-payment on internet banking platform is safe.	2 0.6%	4 1.2%	8 2.4%	190 57.6%	126 38.2%	4.32	0.64
IBS5	I trust the security measures of my internet banking services.	1 0.3%	3 0.9%	5 1.5%	198 60.0%	123 37.3%	4.33	0.59

Source: Extracted from IBM SPSS output, 2021

=Table 5 shows the descriptive result of Internet banking security based on the response from the respondents. The result shows that IBS3 has the highest mean of 4.53, closely followed by IBS2 with 4.47, IBS4 has the least mean of 4.32. IBS4 has the highest standard deviation of 0.64, closely followed by IBS3, IBS and with 0.61 and 0.60 respectively, while IBS2 has the least standard deviation of 0.58. Most of the respondents have agreed with the questions as indicated on the table.

Table 6: Internet Banking Privacy Questionnaire Items

S/no	Questionnaire Items	SD(1)	D(2)	U(3)	A(4)	SA(5)	Mean	St D
IBP1	Internet banking services abides by personal data protection law.	4 1.2%	6 1.8%	32 9.7%	190 57.6%	98 29.7%	4.12	0.75
IBP2	Internet banking only collects user's personal data necessary for the transaction	3 0.9%	5 1.5%	22 6.7%	195 59.1%	105 31.8%	4.19	0.70
IBP3	Internet banking does not provide my personal info to others without my consent	2 0.6%	17 5.2%	14 4.2%	152 46.1%	145 43.9%	4.28	0.82
IBP4	Internet banking shows concern for privacy of its users.	3 0.9%	10 3.0%	22 6.7%	185 56.1%	110 33.3%	4.18	0.76
IBP5	Internet banking services has good privacy policies	0 0.0%	6 1.8%	9 2.7%	173 52.4%	142 43.0%	4.37	0.63

Source: Extracted from IBM SPSS output, 2021

Table 6 shows the descriptive result of Internet banking privacy based on the response from the respondents. The result shows that IBP5 has the highest mean of 4.37, closely followed by IBP3 with 4.28, IBP1 has the least mean of 4.12. IBP3 has the highest standard deviation of 0.82, closely followed by IBP4 and IBP1 with 0.76 and 0.75 respectively, while IBP5 has the least standard deviation of 0.63. Most of the respondents have agreed with the questions as indicated on the table.

Table 7: Customer Trust Questionnaire Items

S/no	Questionnaire Items	SD(1)	D(2)	U(3)	A(4)	SA(5)	Mean	St D
CT1	I trust the internet for banking transactions.	1 0.3%	4 1.2%	10 3.0%	190 57.6%	125 37.9%	4.32	0.62
CT2	With adequate safety measures on my bank web site, I do not hesitate to enter my credit card info	2 0.6%	11 3.3%	16 4.8%	163 49.4%	138 41.8%	4.28	0.76
CT3	I am prepared to give my private info for my internet banking transactions	1 0.3%	6 1.8%	12 3.6%	157 47.6%	154 46.7%	4.38	0.68
CT4	I trust my bank on my internet banking transactions.	1 0.3%	1 0.3%	1 0.3%	184 55.8%	143 43.3%	4.42	0.55
CT5	Internet transactions always function as expected	6 1.8%	12 3.6%	36 10.9%	182 55.2%	94 28.5%	4.05	0.84

Source: Extracted from IBM SPSS output, 2021

Table 7 shows the descriptive result of customer trust based on the response from the respondents. The result shows that CT4 has the highest mean of 4.42, closely followed by CT3 with 4.38; CT5 has the least mean of 4.05. CT5 has the highest standard deviation of 0.84, closely followed by CT2 with 0.76, while CT4 has the least standard deviation of 0.55. Most of the respondents have agreed with the questions as indicated on the table.

E. Reliability and Validity Analyses

PLS-SEM supported by a host software called Smart PLS was used in analyzing the data for testing all the hypotheses. The first step in Smart PLS analysis is to evaluate the measurement model otherwise known as outer model. The measurement model basically displays the actual goodness of the measures for the study (Ramayah, Lee & In, 2011). In Smart PLS, there are two main criteria of evaluating the measurement model of a study, namely: Reliability and validity. The reliability test evaluates how consistently measuring instruments measures what it is meant to measure

(internal consistency), while validity tests evaluate how well an instrument measures an exact concept it is designed to measure (Hair *et al.*, 2012).

In consistent with the rules of thumb, the items outer loadings were considered to be a minimum of 0.5 and above. Consequently, all the indicators with outer loading below 0.5 were deleted starting with the one that has the lowest value. This method is the best appropriate way of improving data quality (Hair *et al.*, 2010).

F. Measurement model

Internal consistency reliability analysis was carried out on the indicators, which is usually determined by using either Cronbach alpha or composite reliability. The study used Composite Reliability (CR) in PLS-SEM analysis which is derived together with Average variance extracted (AVE). It is generally considered more vigorous and gives much less biased estimate of reliability than Cronbach alpha for it

usually has deficiency of over/underestimating or miscalculating construct’s reliability (Hair *et al.*, 2014).

According to Hair *et al.*, (2014), values ranging from 0.60 to 0.70 are considered acceptable, 0.70 to 0.90 are considered excellent in advance research and less than 0.60 indicates lack of internal consistency.

Based on the information shown on Figure 3 and Figure 4, all the constructs in the model have met the criteria as they have the composite reliability that is greater than 0.70.

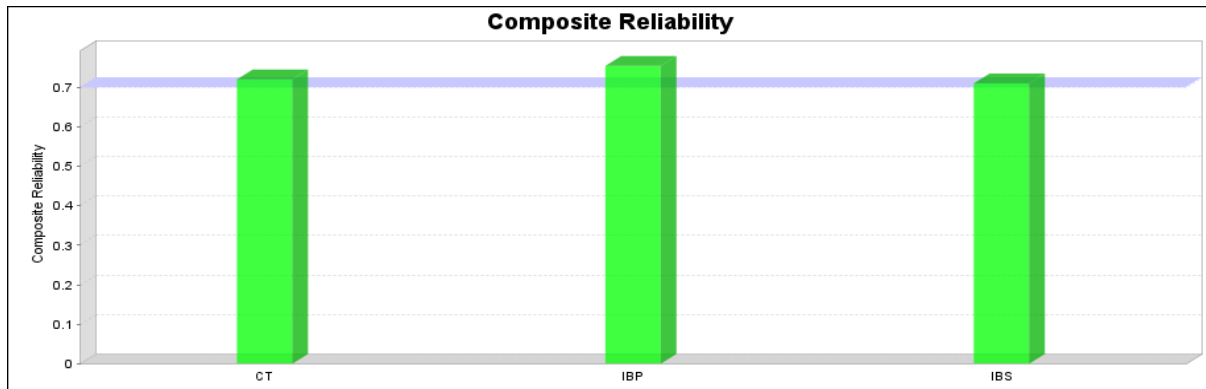


Fig 3: Composite Reliability Graph
Source: Extracted from SmartPLS output, 2021

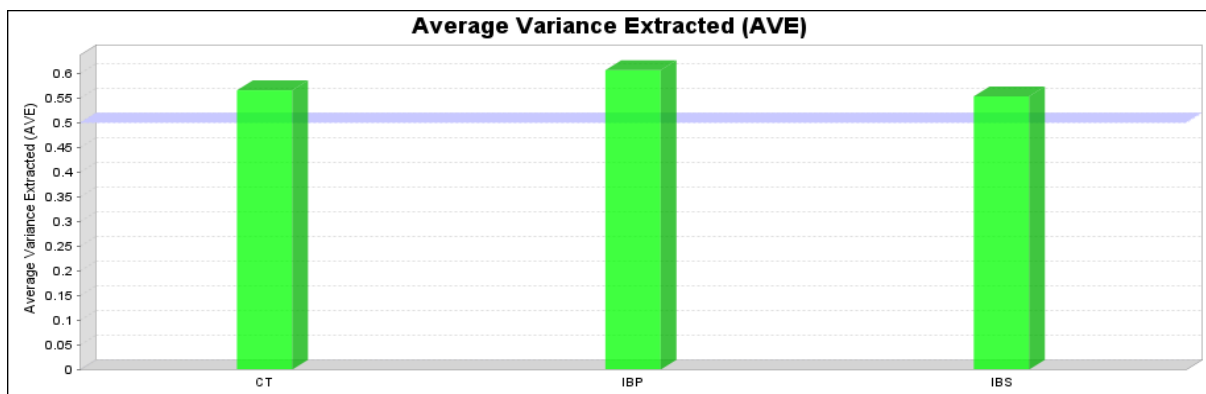


Fig 4: Average Variance Extracted Graph
Source: Extracted from SmartPLS output, 2021

G. Convergent validity

Convergent validity is the degree to which indicators measuring a construct correlates with other indicators of the same construct and also shows the level of their true representation of that latent construct (Hair *et al.*, 2013). According to Hair *et al.*, (2012), convergent validity can be attained by assessing the factor loadings and the AVE. Indicators that loads from 0.50 to 0.70 shows an indication of association among indicators, while any indicator with less

than 0.40 should be deleted from the model in order to achieve an acceptable AVE.

In conformity with the above threshold, three items (IBP2, IBP3 & IBP4) were deleted from internet banking privacy construct, three items (IBS1, IBS2 & IBS3) were deleted from internet banking security construct. And two items were deleted from customer trust construct which are (CT1, CT3 & CT4).

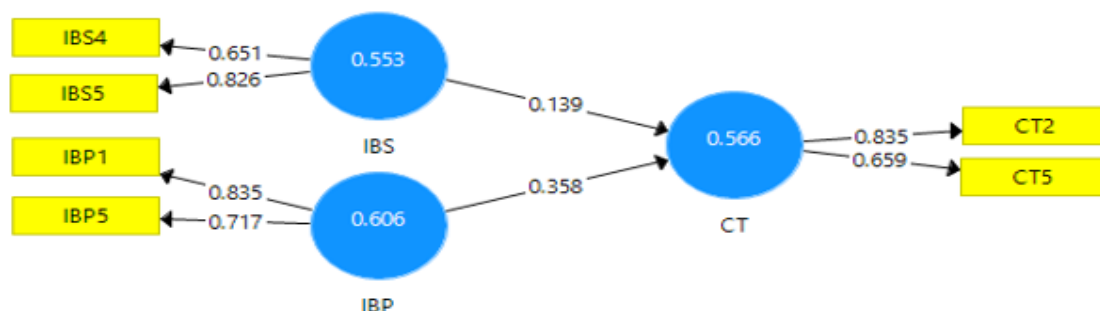


Fig 5: Revised Measurement Model
Source: Extracted from Smart PLS output, 2021.

H. Discriminant validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards. Therefore, establishing discriminant validity indicates that a construct is absolutely unique and also captures phenomena not represented by other constructs in the model (Hair *et al.*, 2014). The squared AVE for all the constructs along the diagonal with bold values while the correlations among the latent constructs in the off-diagonal rows and columns with un-bolded values.

Table 8: Discriminant Validity

S/N	Constructs	1	2	3
1	Customer Trust	0.752		
2	Privacy	0.393	0.779	
3	Security	0.229	0.254	0.744

Source: Extracted from SmartPLS output, 2021.

I. Structural Model

Having examined the measurement model, this section evaluates the structural (inner) model. Structural model explains the dependence of relationship in the hypothesized model (Hair *et al.*, 2012). Therefore, the structural model in Smart PLS is aimed at testing the hypothesized relationships among all the constructs/variables. In this study, the two directional relationships were between two independent variables (IVs) and one dependent variable (DV). Figure 6 shows the structural model of the study.

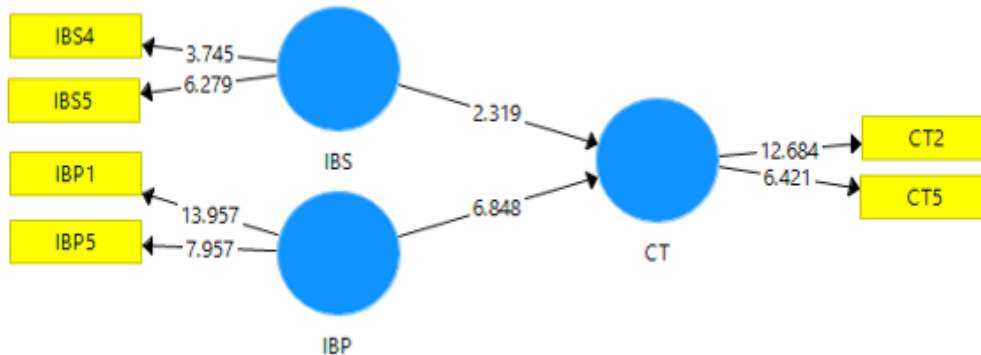


Fig 6: Structural Model

Source: Extracted from Smart PLS output, 2021.

J. Assessing the level of R² in the model

After the assessment of the path models, the next significant criterion for evaluating structural model in Smart PLS is the evaluation of the R² value, alternatively referred to as the coefficient of determination (Hair *et al.*, 2012, Henseler *et al.*, 2009). R² value tells us how much of the variance in the endogenous latent construct is explained by the exogenous latent constructs in the model (Ramayah, 2015). It signifies the amount of variation in the dependent variable(s) that can be explained by one or more predictor construct/variable (Hair *et al.*, 2014). According to Cohen (1988), R² values of 0.26, 0.13 and 0.02 is considered as substantial, moderate and weak respectively. This study has one endogenous construct, which is customer trust. Based on the information on figure 4, it has an R² value of 0.172. In line with the rule of thumb suggested that by Cohen (1988), it means that it has a moderate R² value or coefficient of determination.

K. Assessing the effect sizes (f²) of the exogenous constructs

In Smart PLS, effect size shows the relative effect certain exogenous constructs on endogenous construct through the estimating change in the R² (Chin, 1998). Calculating effect size could reveal the extent of contribution each of the independent variables has on the dependent variable.

Effect sizes are evaluated as small (0.02), medium (0.15) or large (0.35) respectively (Cohen, 1988). Although Chin, Marcolin, and Newsted (2003) posited that even a small interaction effect can be meaningful, then it is important to take the effects into account. Consequently, the result of the effect sizes as depicted in Table 9.

Table 9: Effect Sizes (f²) of the Exogenous Construct

Endogenous Construct	Exogenous Constructs	Effect Size (f ²)	Cohen (1988)
Customer trust	Privacy	0.15	Medium
	Security	0.02	Small

Source: Extracted from Smart PLS output, 2021.

L. Determining the predictive relevance (Q²)

In Smart PLS, predictive relevance is meant to establish the quality of the model or its goodness of fit. Stone (1974) and Geisser (1975) suggested blindfolding technique to test predictive relevance of a model. The blindfolding procedure advocates that the model must be able to adequately predict each endogenous latent construct's indicators. If the calculated Q² value is greater than zero (0), it implies that the exogenous constructs have predictive relevance for the endogenous construct under consideration (Hair *et al.*, 2014). After blindfolding, the Q² result was derived through the cross

validated redundancy (cv-red) which explains the ability of the model to predict the endogenous variables and hence reveals the quality of the research model. (Chin, 2010; Hair *et al.*, 2012).

From the result in figure 7, and table 10, the research model has a predictive relevance of 0.082 which satisfies the condition of being greater than zero and indicates that the research model has a good predictive relevance.

Table 10: Predictive Relevance (Q²)

Constructs	SSO	SSE	Q ² = (1-SSE/SSO)
Customer Trust	660.000	606.118	0.082
Privacy	660.000	660.000	
Security	660.000	660.000	

Source: Extracted from Smart PLS output, 2021.



Fig 7: Predictive Relevance

Source: Extracted from Smart PLS output, 2021.

M. Hypotheses Testing

In this section, the result of the hypothesized direct relationship/effect of each independent variable on the dependent variable was presented. Two hypotheses were tested in order to obtain the *t*-values and *p*-values. If the data is not normal the *t*-values would be inflated or deflated which would lead to Type I error. Thus, to get the *t*-values for the item loadings and the path coefficients, there is need to run the bootstrapping procedure (Ramayah, 2015).

Statistical *t*-values that are substantially different from 0 is said to be almost always statistically significant. However, it is largely depending on the degree of freedom, confidence interval and the direction of hypothesis, thus *p*-value is used to ascertain if the paths are significant (Hair *et al.*, 2014).

So, if the *t*-value greater than 1.645 (*p* < 0.05), and if the *t*-value greater than 2.33 (*p* < 0.001) for 1-tail test, and if the *t*-value greater than 1.96 (*p* < 0.05) and if the *t*-value greater than 2.58 (*p* < 0.001) then they are significant for 2-tail test (Ramayah, 2015). Table 11 shows the result of the hypotheses which indicated the *t*-value, *p*-value and decision.

The following two direct hypotheses were developed in order to ascertain their acceptance or rejection in line with the research questions:

- H₁: Internet banking privacy has significant effect on customer trust
- H₂: Internet banking security has significant effect on customer trust

The two hypotheses tested were non directional (2-tail), and the results on table 11, show that the two IVs have significant effect on the DV.

Table 11: Hypotheses Result

Hypotheses	Relationship	<i>t</i> -Value	<i>p</i> -Value	Decision
H1	PRIVACY -> CUSTOMER TRUST	6.932	0.000*	Supported
H2	SECURITY -> CUSTOMER TRUST	2.362	0.018*	Supported

**p* < 0.001, **p* < 0.05

Source: Extracted from Smart PLS output, 2021

V. DISCUSSION

After running the bootstrapping procedure for the model, all the two research questions were answered and tested.

A. Internet banking privacy and customer trust

The first research question states that to what extent does internet banking privacy has affected customer trust. The question has been answered through the first hypothesis

which state that internet banking privacy has significant effect on customer trust. With a high *t*-value of 6.932 signifies that it is significant at less than 1% (*p* < 0.000) significance level. Privacy of internet banking services is paramount in terms of customers' trust. Having a strong privacy policy that will protect the interest of the customers significantly affect their trust level of internet banking services. Internet banking privacy has the highest level of significance compared to the other four variables. It is logically acceptable to say that privacy is the major concern of internet banking customers.

This agreed with a study conducted by Abdallah (2017) which examined the effect of perceived e-service quality on customer trust, and found out that internet banking efficiency has significant effect on trust.

B. Internet banking security and customer trust

The second question which is the last state that to what extent does internet banking security has affected customer trust. It has been answered through the second hypothesis which state that internet banking security has significant effect on customer trust. The result shows that it has a t -value of 2.362 which reveals that it is significant at less than 5% ($p < 0.018$) significance level. Security of internet banking services is paramount in terms of customers' trust. Internet banking security is the second highest which shows how important security is to customers while carrying out online transaction.

The findings of the study reveal that all the two variables have a direct and significant relationship with the customers' trust. Improving these qualities of internet banking services will definitely improve their level of trust with internet banking services.

This study agreed with a study conducted by Abdallah (2017) which examined the effect of perceived e-service quality on customer trust, and found out that internet banking service quality has significant effect on trust. The study also agreed with the study of Al-khalifa (2016) that service quality is the most significant determinant of customer trust. The quality elements of the e-service have affected e-trust directly because they represent trust cues that convey the trustworthiness of the site and the system to customers. Lastly, the study also agreed with the study of Alalwan *et al.*, (2016) which reveals that in the context of internet banking, site efficiency, security and performance consistency are important in building customer trust towards an online retail firm.

VI. SUMMARY OF FINDINGS

This chapter has extensively described the procedures followed in analyzing the data.

- The result of the analysis of the measurement model shows that the research model has achieved reliability, convergent and discriminant validity. All the loadings of composite reliability exceed the threshold of > 0.7 , convergent validity (AVE of not less than 0.4), and a discriminant validity was achieved as the square root of all the construct's AVE was greater than its highest correlation with any other construct.
- Structural model is examined and the hypotheses were also tested. With an R^2 value of 0.172 which indicates that the variance in the DV (customer trust) is explained by all the two constructs, which is in line with the rule of thumb suggested that by Cohen (1988), it means that it has a substantial coefficient of determination.
- The effect size (f^2) shows that the two IVs have a medium and small effect size on the DV based on the criterion set by Cohen (1988). The research model has a predictive relevance (Q^2) of 0.082 which satisfies the condition of

being greater than zero and indicates that the research model has a good predictive relevance (Hair *et al.*, 2014). All the two hypotheses have been accepted or supported as they have good significance level.

- The first hypothesis on internet banking privacy has the highest level of significance with a p -value of 0.000 ($p < 0.001$), that is 1% significance. This shows that the privacy aspect of internet banking is of paramount importance with regard to the trust of the bank customers. Whereas, the second hypothesis has a significance level with a p -value of 0.018 ($p < 0.005$), that is 5% significance.

VII. CONCLUSION AND RECOMMENDATIONS

The result of the study showed that internet banking e-service qualities are essential to customers' trust. Based on the response generated, the variables have strong effect on customers' trust. Tertiary institutions students represent an attractive segment of customers, they mark the test of future profitable market for banks and financial institutions because they are usually the first-time account holders, and if nurtured properly, could evolve into profitable retail clients to banks in the future. Therefore, for banks to thrive on tertiary institutions, they should focus more on the best way to satisfy students with service they rendered. They must of necessity be concerned about the attributes of the SERVQUAL model (availability and efficiency). This is so because customer measure quality along its dimensions and on the basis of its dimensions Bank can know which area of their service offering needs improvement. It can be concluded that service quality is key to customers' trust which is also the key to the overall success of the banks.

It is therefore recommended that, there should be adequate privacy policies that will ensure the confidentiality of all transactions via electronic channels. Banks should improve on protecting the information of their customers as any leakage of such may lead to third party having access to the customers' account. Therefore, the privacy of customers' information should be of utmost concern to the banks as they are highly considered as a factor that affects the e-banking service quality.

It is imperative upon the banks to ensure they build the confidence of their customers by ensuring adequate security measures are taken that will protect the customer. Therefore, highly advanced and sophisticated technologies should be used by banks in order to ensure that customers are highly protected. This will go a long way in improving the service quality of the e-banking system which will lead to high level of trust.

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