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ORIGINAL ARTICLE

Impact of E-service quality on customer satisfaction: a study of internet banking for general and maritime services in Nigeria

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Abstract

Despite the increased availability and accessibility of the internet, many bank clients continue to queue in the bank. This enigma necessitates research on customers' perceptions of the quality of internet banking services in relation to customer satisfaction. The study examined the relationship using the process and outcome theory of service quality. A sample of 280 internet banking clients of General and Maritime service firms responded to the survey. Confirmatory factor analysis was performed to evaluate the measurement model's validity and reliability. To assess the importance of the link between the variables, structural equation modelling was used. Statistical research results show that the service quality measures (website quality, functional quality, recovery quality and security quality) are significantly associated with customer satisfaction, with functional quality having the highest impact. With respect to the dimensions, website ease of use has the highest weight among the three dimensions of website quality; reliability has the higher weight between the two dimensions of functional quality; compensation has the highest weight among the three dimensions of recovery quality while informational security has the higher weight between the two dimensions of security quality. The study's findings will provide valuable information to bank managers and bank industry regulators to monitor internet banking service quality and improve customer satisfaction.

Keywords E-service quality · Internet banking · Technology · Customer satisfaction · Process and outcome model

Introduction

The growth and development of internet and information technology have significantly revolutionized operations in the banking industry (Ejigu 2016; Sindhu 2019). Globally, banks utilize the internet as a strategic instrument in their everyday business activities (Fariz and Bagher 2014; Sritharan and Ragel 2019). Internet banking is a supplementary channel and an alternative technique of offering customers with quicker self-controlled transactions that use the internet as the transaction medium. The Central Bank of Nigeria (CBN) introduced Guidelines for Electronic Banking in 2003, kicking off the online financial revolution in the Nigerian banking industry, which was followed by a bank reformation effort in June 2004 (Adesina and Ayo 2010). The surviving 21 banks have made significant investments in technology as a platform for effective and efficient delivery of financial services. Therefore, the critical question currently in Nigeria is not whether to deploy internet technology but how to deploy it to serve customers better. According to DataReportal (2021), the internet penetration rate in Nigeria is 59.5%. However, KPMG (2020) indicated that 35% of Nigerians have adopted internet banking. These data represent 14% increase in comparison with 2019. With the rise in the number of internet banking users, a need arises to investigate the perception and satisfaction of bank customers who have adopted internet banking, especially in this era of financial sector strategy 2020 for General and Maritime services in Nigeria. This will provide empirical evidence for users' pleasure or displeasure concerning their previous transactions and experiences with internet banking.

Maliheh et al. (2012) opined that mere presence on the Web is not the justification for success but the availability of high-quality e-services. Similarly, Raza et al. (2020) noted that 'service quality plays a major role in services marketing,

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as it has become the basis for how customers interpret internet banking'. In today's changing banking environment, banks must deliver excellent services, be devoted to excellence in customer service, and play a vital part in the expanding and diversified financial industry. Customers perceive direct banking quality differently from online banking quality. Therefore, as banks strive to align their operations with technological advancement and reduce face-to-face encounters in service delivery, awareness of customers' views of e-service quality becomes increasingly crucial in bank marketing. The significance of e-service quality stems from the fact that it is a prerequisite for assuring sustained usage and attraction of new clients. According to Fariz and Bagher (2014), one of the key criteria affecting the success or failure of electronic commerce is e-service quality. It is one of a firm's competitive capabilities that contributes to commercial performance. Service quality and customer satisfaction are two important factors that will keep customers using internet banking (Amin 2016). Without customer satisfaction, occasional users may seek alternatives, while committed users may likely manifest dissatisfaction and return to traditional banking practices, thus negating the benefits of internet banking.

Majority of the studies on internet banking are on intention to adopt the service (Michael et al. 2012; Raza and Hanif 2013; Ali Saleh and Khalil 2013; Tarhini et al. 2015; Sharif and Raza 2017; Chang et al. 2020). Therefore, a research gap exists on the perception of service quality and satisfaction of bank customers who have adopted internet banking. Several studies have examined the relationship between service quality and customer satisfaction in internet banking; however, the relationship has not been examined for General and Maritime services.

Moreover, most studies used the SERVQUAL and E-SERVQUAL models (Alsudairi 2012; Sakhaei et al. 2014; Ali and Raza 2015; Okeke et al. 2015; Ejigu 2016; Aruna 2018; Raza et al. 2020; Das and Ravi 2021). Research on Gronroos (1984) and Narteh (2013) process and outcome model of service quality seems to be inadequately investigated. In addition, the maritime sector in Nigeria is being urged by CBN to use online banking. As such, the objective of this study is to identify the e-service quality perception of current users that may influence customer satisfaction with internet banking using the process and outcome theory of service quality for General and Maritime services. The research contributes to the literature on financial services marketing and the body of knowledge on e-service quality of internet banking. The study examined four key dimensions of e-service quality (website quality, functional quality, recovery quality and security quality) and their influence on customer satisfaction. This will be useful to bank managers and bank industry regulators in developing and implementing guidelines to improve the use of internet banking.

Literature review

Theoretical framework

The Gronroos (1984) model of service quality is the foundation of process and outcome theory of service quality and is based on service excellence that includes how clients are treated and the outcomes that they expect. Although, in comparison with the SERVQUAL model, it has not been widely adopted in many research contexts (Radomir et al. 2015; Polyakova and Mirza 2015), Narteh (2013) believes it is the most appropriate model for online banking service quality because customers value not only how they are served (process quality), but also, and more importantly, the outcome of the service they receive (outcome quality). The Gronroos model defined service quality as a two-dimensional construct with functional (process) and technical (outcome) dimensions. This means that perceived service quality, which is based on the comparison of customer's expectations and the service received, is determined by two dimensions: functional or process dimension and technical or outcome dimension. Narteh (2013) adapted the model to a three-dimensional construct (functional, technical and recovery quality). In this study, technical quality is conceptualized as website quality. Moreover, security quality was added as one of the service quality measures based on Abdulrahman and Premalatha (2014) observation that issues relating to fraudulent activities strongly influence customer satisfaction with online banking in Nigeria.

The concept of E-service quality

An e-service, also known as electronic service, is a service that is delivered to a client or potential customer over the internet (Sakhaei et al. 2014). Service quality has also been defined as the difference between a customer's expectation of a service and his or her appraisal of the service's implementation (Ejigu 2016). The measurement of e-service quality has received a lot of attention lately. Several studies have attempted to identify significant characteristics of e-service quality associated with internet banking in the literature. Raman et al. (2008) investigated internet banking service quality and identified the dimensions of e-service quality as ease of use, appearance, reliability, customization, communication and incentive. Shirshendu and Sanjit (2011) identified e-banking service quality as customer service, security and information quality, convenience, usage easiness and reliability. Alsudairi (2012) measured e-banking service quality using accessibility, usability, functional usefulness, safety, convenience, responsiveness and realization.

Onyedimekwu and Oruan (2013) identified system quality (security, reliability, ease of use and service availability), information quality and service quality. Ganjinia et al. (2013) proposed reliability, responsiveness, competence, ease of use, security and product portfolio. In the study of Sakhaei et al. (2014), e-banking service quality dimensions include reliability, efficiency, responsiveness, fulfillment, privacy/security, website design while Demyana (2014) identified efficiency, fulfillment, system availability, privacy, assurance/trust, site aesthetics, responsiveness and contact. Okeke et al. (2015) posited that the dimensions of e-banking service quality are reliability, assurance, responsiveness, perceived risk, tangibility, security and price while Aruna (2018) is of the view that the dimensions are reliability, responsibility, tangibility, assurance, empathy, efficiency, fulfillment and privacy. Sritharan and Ragel (2019) indicated efficiency, fulfillment, system availability, privacy, responsiveness, compensation and contact while Das and Ravi (2021) identified reliability, security and privacy, website design, responsiveness and communication.

The studies that measured e-service quality has provided evidence that e-service quality is a multidimensional construct and there is significant variation in the number of the quality dimensions. Based on the unique characteristics of internet banking in the Nigerian context, the study proposed that it is worthwhile to consider and test the dimensions, within the framework of website, functional, recovery and security quality. Thus, building on previous studies and the recognition that quality dimensions are not made only on the value of the service but also on the evaluation of the process and recovery quality, this study developed a conceptual model of ten dimensions classified into four groups: website quality, functional quality, recovery quality and security quality (Fig. 1).

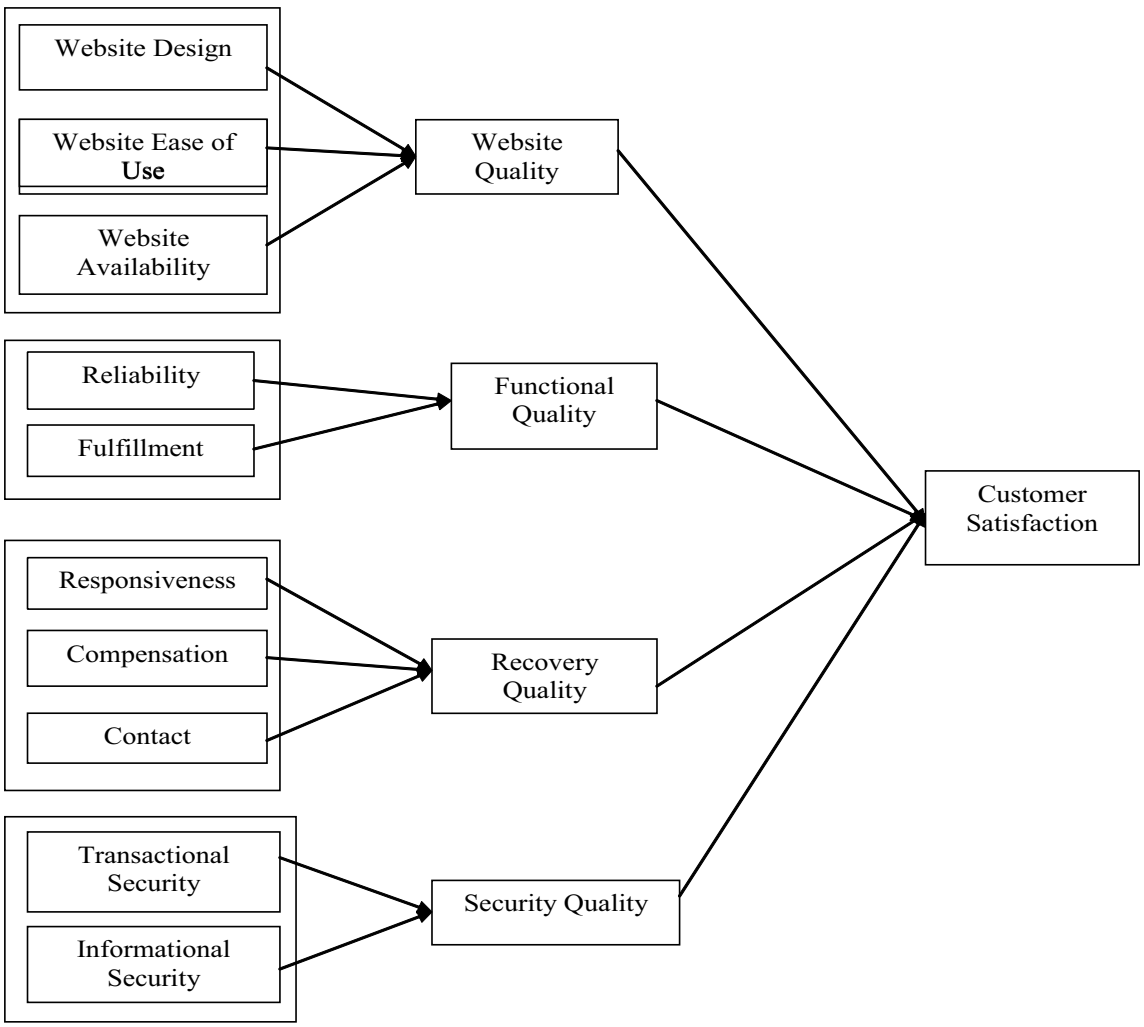

Fig. 1 Research model

Website quality

In an electronic service environment, the website is the primary entry point for customers to conduct online transactions and achieve a successful transaction. Due to the lack of face-to-face interaction with service staff, online banking clients interact with the user interface, thus impacting their appraisal of service quality and satisfaction (Zhengwei and Jinkun 2012; Das and Ravi 2021). Customers who utilize internet banking must first visit the bank's website. Consequently, if the bank's website is properly designed, the customer may be satisfied with the internet banking service. Ganjinia et al. (2013) argued that advanced design with high visuals should be avoided in internet banking systems since it increases page load time and reaction time and can lead to user discontent. This suggests that the quality of a website may or may not have an impact on customer satisfaction. However, an excellent web page should be able to deliver relevant information as well as different functions to customers. According to Sindhu (2019), website features and simplicity of use are crucial to customer satisfaction. Customers rate websites and service quality delivery in terms of availability and content, simplicity of use or usability of websites. According to some researches (Shirshendu and Sanjit 2011; Amin 2016; Das and Ravi 2021), website quality has a significant impact on customer satisfaction. On the contrary, Sakhaei et al. (2014) found that website design has less influence on customer satisfaction. However, Raza et al. (2015) noted that banks should focus on making the design and content of the websites more visually appealing to grab the attention of existing customers, as well as to attract new customers. Thus, it is hypothesized that:

H1 The quality of a website has a significant impact on customer satisfaction with internet banking.

Functional quality

This dimension represents the process performance of service delivery (Narteh 2013). It reflects how the service is perceived to have been performed. It evaluates the functioning of internet banking in terms of reliability and fulfilment. Customers encounter various issues since internet banking is offered over the internet. First and foremost, there is no direct interaction between service staff and customers, and secondly, the service delivery context has been radically altered (Sindhu 2019). As a result, the internet service must be dependable and consistent, and the goal for which the client is utilizing internet banking should be met. It is critical to persuade customers to trust that it will perform what it has promised to deliver (Wali and Opara 2012). Reliability has been found as one of the determinants of customer satisfaction (Shirshendu and Sanjit 2011; Ganjinia et al. 2013; Sakhaei et al. 2014; Aruna 2018; Raza et al. 2020) while fulfillment was found to be the most significant by Demyana (2014) and Sritharan and Ragel (2019). Consequently, the study hypothesizes that:

H2 The functional quality of internet banking has a significant impact on customer satisfaction.

Recovery quality

This represents customers' expectations when a problem occurs and how the bank actually manages the situation. Recovery quality has been recognized as a major dimension of technology-based service quality (Parasuraman et al. 2005), and it is measured by responsiveness, compensation and contact. Recovery quality was introduced into the Gronroos model by Narteh (2013) because e-banking still poses some challenges, and how these challenges are addressed could affect the perception of service quality. Prompt service to customers might help them feel more at ease with the service. Hence, effective issue handling over the internet, as well as fast reimbursement, may have an impact on customer satisfaction. There should also be contact information in the form of a phone number or an email address that clients may utilize if there are challenges. Sritharan and Ragel (2019) found contact to be significant but according to Ejigu (2016) and Sindhu (2019), responsiveness has the greatest influence on customer satisfaction. Thus, the following hypothesis is proposed:

H3 Recovery quality has a significant impact on customer satisfaction with internet banking.

Security quality

The level of security in internet banking relates to how safe it is and how well customer information is safeguarded (Das and Ravi 2021). According to Agbonifoh et al. (2007), two kinds of security are desired by customers who use the internet: transactional and informational securities. Transactional security refers to safety over business deals carried out over the internet. In contrast, informational security is associated with protection from any kind of loss arising from illegal use of customers' information by unauthorized persons, otherwise referred to as privacy. This factor is crucial in financial services because users feel considerable dangers in the virtual world due to the increasing occurrence of internet fraud (Zhengwei and Jinkun 2012). Security has been cited as a key element influencing customers' decision to utilize internet banking and customer satisfaction (Akinyele and Olorunleke 2010; Zhengwei and Jinkun 2012; Ganjinia et al. 2013; Raza and Hanif 2013; Sakhaei et al. 2014; Aruna 2018;

Sritharan and Ragel 2019; Das and Ravi 2021). Hence, the following hypothesis is formulated:

H4 Security quality has a significant impact on customer satisfaction with internet banking.

Service quality and customer satisfaction

Customer satisfaction refers to a customer's contentment about a previous purchase experience with a certain service (Sindhu 2019). In the view of Raza et al. (2020), satisfaction is the feeling of happiness or displeasure that arises in an individual due to the comparison of a product's actual and expected performance. According to Sritharan and Ragel (2019), customer satisfaction diminishes customers' perceptions of the possible benefits of competing services and it is vital in bank marketing since there are other channels.

There has been a lot of discussion on the relationship between service quality and customer satisfaction. Shirshendu and Sanjit (2011) investigated the generic service quality dimensions of technology-based banking and their influence on customer satisfaction and customer loyalty. Customer service, technology usage easiness and reliability were proven to have positive and considerable effect on customer satisfaction and customer loyalty. Zhengwei and Jinkun's (2012) study on e-banking customer satisfaction in China found that website quality has a direct and significant effect on e-banking quality. Efficiency, interactivity, security, information, ease of use and content were also found as key factors affecting customer satisfaction. Ganjinia et al. (2013) investigated the impact of online service quality on customer satisfaction in banks of Guilan, Iran. Six dimensions including reliability, responsiveness, competence, ease of use, security and product portfolio were identified as dimensions of online services quality, and the results showed that all the six factors had significant effect on customer satisfaction.

Sakhaei et al. (2014) also conducted research to identify service quality factors in internet banking and to develop a model to measure customer satisfaction that would be appropriate for internet banking. The six service quality dimensions of reliability, efficiency, responsiveness, fulfillment, security/privacy and website design were discovered to have meaningful relationship with customer satisfaction with reliability having the most influence and website design having the least influence. Fariz and Bagher (2014) assessed and ranked the factors influencing the quality of e-banking service based on both active (website content, website composition and structure, website link, website ease of use and website appearance) and passive dimensions (motivation, website reliability, website performance, website support, website communication and website security). According to the findings, website support has the greatest effect on service quality followed by appearance, performance, reliability, security, links, communication, motivation, ease of use, composition and structure and finally website content. Demyana (2014) conducted research into the relationships between e-service quality dimensions and overall internet banking service quality as well as their influence on customer satisfaction in the USA banking industry. Eight dimensions (efficiency, fulfillment, system availability, privacy, assurance/trust, site aesthetics, responsiveness and contact) of internet banking service quality were investigated. The results showed significant relationships among the e-service quality dimensions and customer satisfaction. The fulfillment attribute was the most potent predictor of internet banking service quality followed by efficiency, site aesthetics, contact, privacy, responsiveness, assurance and finally system availability.

Okeke et al. (2015) investigated the relationship between service quality dimensions and customer satisfaction in Nigeria. Seven dimensions (reliability, assurance, responsiveness, perceived risk, tangibility, security and price) were examined but five (price, security, perceived risk, responsiveness and assurance) significantly influenced customer satisfaction. Reliability and tangibility were not found to be significant. Aruna's (2018) study on service quality dimension of e-banking services with reference to Vellore District found that the service quality dimensions of reliability, responsiveness, tangibility, assurance, empathy, fulfillment, efficiency and privacy significantly predict customer satisfaction.

Sindhu (2019) explored the relationship between e-service quality of internet banking (responsiveness, efficiency and perceived credibility) and customer satisfaction in India. The author discovered that the most essential component of internet banking e-service quality is responsiveness and that there is a positive relationship between e-service quality dimensions and customer satisfaction. Sritharan and Ragel (2019) examined seven service quality dimensions, namely efficiency, fulfillment, system availability, privacy, responsiveness, compensation and contact but four: fulfillment, privacy, responsiveness and contact have significant positive impact on customer satisfaction. Furthermore, Raza et al. (2020) explored the service quality dimensions in internet banking and their impact on e-customer's satisfaction and e-customer's loyalty. The findings revealed that all the dimensions (site organization, reliability, responsiveness, user friendliness, personal need and efficiency) have a positive and significant influence on customer satisfaction. Das and Ravi (2021) evaluated the relationship between e-banking service quality parameters and customer satisfaction in order to determine which aspects had the greatest impact on customer satisfaction. The characteristics of dependability, security and privacy, website design, timeliness and communications, according to the authors, all have a positive influence on customer satisfaction. It was also discovered

that the most essential feature of e-banking service excellence is website design.

Despite scholarly efforts to uncover the criteria that customers use to evaluate the quality of internet banking services, a review of these studies reveals that some theoretical and methodological research gaps still exist, particularly in the Nigerian context. Based on extant research on internet banking in Nigeria, the rising use and adoption of internet banking by several banks trying to be technology oriented, and the encouragement by CBN, it appears there is no significant effort to investigate the perception of clients who have embraced the technology through the process and outcome model of service quality especially for General and Maritime services. If banks wish to enjoy the benefits of internet banking, they must first understand how present users view the service, the characteristics of the clients who use it and their level of satisfaction with the service. This study is conducted in response to these gaps in the literature in order to increase understanding of the attributes used by customers to assess the service quality of internet banking and how such evaluations impact their satisfaction.

Methodology

The study used a cross-sectional research design and a quantitative research technique. The population comprises individual clients who utilize internet banking for General and Maritime services in Lagos State, Nigeria. The Krejcie and Morgan (1970) table was used to determine the sample size of 384. The respondents were selected using convenience and volunteer sampling. Convenience samling was used because most of the General and Maritime service firms are located around Apapa in Lagos State. Again, some of the respondents were not willing to participate in the survey. Therefore, the selection of the respondents was not only based on their availability and accessibility but also on their willingness to participate in the study.

The data were collected with the aid of a structured questionnaire. The questionnaire was designed based on the research model, and the items in the questionnaire were chosen based on the study objective. The questionnaire consists of 40 items divided into three sections. Section A includes 5 questions on the respondents' demographic characteristics, including gender, age, level of education, monthly income and employment status. Section B, which had 31 positive-worded statements, assessed the e-service quality aspects of internet banking, while Section C included 4 measures to assess customer satisfaction. The items were adapted from Mohammad et al. (2013) and Aruna (2018). The constructs of the study were measured on a five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1).

Initially, the research instrument was face validated by two senior academic staff in finance and marketing. Thereafter, 50 copies of the questionnaire were administered to determine the reliability of the instrument. At this stage, Cronbach's alpha was used to assess the internal consistency reliability of the research instrument. The Cronbach alpha coefficients of the e-service quality dimensions: website design, website ease of use, website availability, reliability, fulfillment, responsiveness, compensation, contact, transactional security and informational security, are 0.858, 0.806, 0.836, 0.872, 0.743, 0.837, 0.834, 0.737, 0.829 and 0.878 respectively. For website quality, functional quality, recovery quality, security quality and customer satisfaction, the Cronbach alpha coefficients are 0.799, 0.863, 0.766, 0.825 and 0.842, respectively. Pallant (2010) noted that a Cronbach alpha coefficient of 0.7 or higher denotes a good internal consistency. Based on the coefficients, the constructs in the research instrument can be deemed reliable and suitable for the research. After the final survey, the validity and reliability of the research instrument was further determined using convergent validity and composite reliability.

The data for the study were collected through face-to-face administration of the copies of questionnaire. Four research assistants including one of the authors collected the data for the study in Apapa area of Lagos State. The data were collected from 5th July to 24th September, 2021. A total of 384 copies of the questionnaire were administered; however, 280 copies were retrieved and used for the analysis. The data were analysed using descriptive statistics (percentages) and inferential statistics (structural equation modeling).

Results

Demographic characteristics

According to Table 1, out of the 280 respondents, 175 (62.5%) were male while 105 (37.5%) were female. Other findings show that the respondents' typical age range is 25–35 years (41%) and that the majority of them possess a BSc/HND degree (36.4%). Furthermore, the respondents' employment status revealed that a relatively large percentage are private sector employees (31.8%). Lastly, the monthly allowance distribution shows that the majority are earning between N100,001 and N300,000 (38.2%).

Assessment of the measurement model

The Smart-PLS 3 software was used to evaluate the measurement model. The factor loading for each measurement item was calculated to see whether there is a substantial variation shared by each item and its construct. The loadings were predicted to be more than the 0.5 minimum acceptable level. In addition, the construct variables' average variance extracted (AVE) values were generated in order to verify the

Table 1 Demographic characteristics of respondents

Characteristics	Frequency	Percent
Gender		
Male	175	62.5
Female	105	37.5
Age (in years)		
Below 25	78	27.9
25–35	115	41
36–45	40	14.3
46–55	38	13.6
Above 55	9	3.2
Level of education		
SSCE	45	16.1
NCE/OND	72	25.7
BSc/HND	102	36.4
Masters	49	17.5
PhD	12	4.3
Monthly income		
Less than N100,000	70	25
N100,001–N300,000	107	38.2
N300,001–N500,000	81	28.9
N500,001 and above	22	7.9
Employment status		
Student	50	17.9
Self-employed	66	23.5
Civil/public servant	68	24.3
Private sector employee	89	31.8
Others	7	2.5

measuring items' convergent validity. According to Chin, the AVEs are expected to be more than the minimum allowable value of 0.5 (Chin 1998). To assess discriminant validity, the Fornell–Larcker criteria, measurement items cross-loadings and the heterotrait–monotrait (HTMT) ratio were used. The Fornell–Larcker criteria require the square roots of the AVE for the constructs to be greater than the inter-construct correlation (Fornell and Larcker 1981). The cross-loadings criteria require loading on individual constructs to be higher than those of corresponding constructs (Chin 1998), while the HTMT ratios are all expected to be less than one (Kline 2011). Finally, a composite reliability test was performed on the measurement items. Garson (2016) suggests a composite dependability score greater than 0.7.

Convergent validity and composite reliability

Table 2 provides the results on the validity and reliability of the construct variables. The results show that all the measurement items have factor loadings above the minimum acceptable threshold of 0.5. This suggests that observed variables in the path model share significant variance with the construct variables.

Further results from Table 2 reveal that all the construct variables have average variance extracted (AVE) greater than the minimum threshold of 0.50. This implies that the constructs satisfy convergent validity. Similarly, the construct variables' composite reliability (CR) values are above the required threshold of 0.7, indicating that the measurement items do not have reliability issues.

Discriminant validity

The numbers on the diagonal (bolded) in Table 3 represent the square root of the AVE, whereas the values off the diagonal are the inter-construct correlations. When the square root of the AVEs is larger than the inter-construct correlations, discriminant validity is obtained. The findings show that none of the correlations is bigger than the diagonal values. This means that the constructs meet the criteria for discriminant validity.

The results of the cross-loadings of the items in Table 4 show that all the loadings are higher on their individual constructs when compared with loadings of their corresponding constructs. This satisfies the cross-loading discriminant validity condition as suggested by Chin (1998).

Table 5 reveals the HTMT ratios of the construct variables. The results reveal that all the constructs have values below one (1.0). This agrees with Kline (2011) HTMT condition for discriminant validity.

Path analysis

A multivariate partial least squares structural equation model was used to evaluate the working hypotheses to characterize the relationship between e-service quality attributes and customer satisfaction (PLS-SEM). Figure 2 shows the results of the PLS algorithm for the structural model, comprising the item loadings, beta coefficients and the R-squared values.

Model fit

The R-squared values indicate the extent of variations in the endogenous variables explained by the exogenous variables. This helps to ascertain the model fit and specifies the predictive power of the variables in the formative model. The result of the R-squared values in Fig. 2 shows that all the first-order constructs variables strongly account for the variations in their respective second-order constructs (website quality, $R^2 = 0.997$; functional quality, $R^2 = 0.998$; recovery quality, $R^2 = 0.998$ and security quality = 0.997). Similarly, the second-order constructs variables strongly predict the endogenous variable (customer satisfaction, $R^2 = 0.856$). These results imply a good model fit for the variables.

Table 2 Validity and reliability of the constructs

Second-order constructs	First-order constructs	Items	Loadings	AVE	CR
Website quality	Website design	WD1	0.616	0.503	0.800
		WD2	0.675		
		WD3	0.806		
		WD4	0.725		
	Website ease of use	WE1	0.812	0.674	0.892
		WE2	0.771		
		WE3	0.863		
		WE4	0.835		
	Website availability	WA1	0.753	0.657	0.851
		WA2	0.806		
		WA3	0.869		
Functional quality	Reliability	RE1	0.825	0.673	0.860
		RE2	0.876		
		RE3	0.757		
	Fulfilment	FU1	0.664	0.639	0.840
		FU2	0.832		
		FU3	0.886		
Recovery quality	Responsiveness	RES1	0.841	0.653	0.849
		RES2	0.776		
		RES3	0.806		
	Compensation	COM1	0.936	0.869	0.930
		COM2	0.929		
	Contact	CON1	0.824	0.646	0.845
		CON2	0.871		
		CON3	0.708		
Security quality	Transactional security	TS1	0.785	0.642	0.843
		TS2	0.846		
		TS3	0.770		
	Informational security	IS1	0.795	0.639	0.842
		IS2	0.792		
		IS3	0.812		
Customer satisfaction	Customer satisfaction	CS1	0.790	0.662	0.887
		CS2	0.813		
		CS3	0.801		
		CS4	0.849		

Table 3 Fornell–Larcker criterion

	Constructs	1	2	3	4	5	6	7	8	9	10
1	Compensation	**0.930**									
2	Contact	0.490	**0.800**								
3	Fulfillment	0.553	0.620	**0.800**							
4	Informational Security	0.318	0.16	0.163	**0.800**						
5	Reliability	0.790	0.611	0.547	0.279	**0.821**					
6	Responsiveness	0.412	0.481	0.658	0.254	0.395	**0.808**				
7	Transactional Security	0.149	0.116	0.078	0.294	0.087	0.123	**0.801**			
8	Website availability	0.522	0.445	0.762	0.237	0.519	0.562	0.058	**0.810**		
9	Website design	0.282	0.209	0.265	0.585	0.323	0.232	0.509	0.337	**0.709**	
10	Website ease of use	0.547	0.489	0.624	0.507	0.492	0.572	0.152	0.629	0.424	**0.821**

Table 4 Indicator item cross-loadings

	Indicator items	WD	WE	WA	RE	FU	RES	COM	CON	TS	IS	CS
WD1	Information in my bank's website is well organized	**0.616**	0.218	0.079	0.095	0.103	0.161	0.166	0.109	0.502	0.391	0.134
WD2	My bank's website appearance is aesthetically attractive	**0.675**	0.236	0.155	0.225	0.083	0.145	0.149	0.070	0.419	0.254	0.220
WD3	My bank's website is clear and understandable	**0.806**	0.301	0.348	0.257	0.28	0.166	0.253	0.162	0.278	0.472	0.268
WD4	It loads its pages fast	**0.725**	0.417	0.309	0.301	0.239	0.186	0.216	0.226	0.183	0.513	0.299
WE1	My bank's website is simple to use	0.298	**0.812**	0.512	0.418	0.479	0.550	0.398	0.440	0.12	0.349	0.426
WE2	It is easy to find what I need in the website	0.332	**0.771**	0.475	0.377	0.469	0.590	0.471	0.325	0.153	0.402	0.403
WE3	The website links are easy to operate	0.400	**0.863**	0.536	0.481	0.543	0.363	0.538	0.421	0.076	0.555	0.512
WE4	It is easy for me to complete a transaction quickly on the website	0.359	**0.835**	0.540	0.338	0.553	0.392	0.385	0.42	0.155	0.351	0.358
WA1	My bank's website is always available anytime l want to use it	0.278	0.425	**0.753**	0.471	0.525	0.408	0.455	0.244	−0.018	0.200	0.48
WA2	The site launches and runs right away	0.295	0.571	**0.806**	0.410	0.526	0.417	0.408	0.438	0.077	0.211	0.429
WA3	Pages at this site do not freeze after I enter my account information	0.247	0.523	**0.869**	0.389	0.492	0.538	0.412	0.386	0.074	0.166	0.412
RE1	When the bank promises to do something by a certain time, it does so	0.294	0.263	0.279	**0.825**	0.322	0.208	0.503	0.417	0.087	0.206	0.690
RE2	My online transactions with the bank are always accurate	0.271	0.404	0.498	**0.876**	0.518	0.343	0.523	0.605	0.038	0.188	0.613
RE3	The bank's site makes accurate promises about the services being delivered	0.23	0.544	0.491	**0.757**	0.495	0.418	0.636	0.469	0.095	0.298	0.601
FU1	The bank's site provides a confirmation of the service ordered	0.214	0.428	0.512	0.244	**0.664**	0.554	0.188	0.367	0.013	0.182	0.251
FU2	The services delivered through my bank's internet banking effectively addresses my banking needs	0.055	0.404	0.552	0.420	**0.832**	0.503	0.463	0.584	0.065	−0.038	0.455
FU3	I have confidence in the my bank's internet services	0.350	0.641	0.640	0.589	**0.886**	0.547	0.601	0.523	0.093	0.247	0.618
RES1	My bank's website tells me what to do if my transaction is not processed	0.206	0.523	0.502	0.402	0.554	**0.841**	0.431	0.553	0.116	0.211	0.412
RES2	The bank gives prompt responses to my requests by e-mail or other means	0.154	0.474	0.486	0.253	0.436	**0.776**	0.284	0.239	0.095	0.227	0.261
RES3	The bank quickly resolves problems l encounter with my online transactions	0.197	0.376	0.367	0.278	0.472	**0.806**	0.256	0.322	0.083	0.180	0.287
COM1	The bank compensates me for problems it creates	0.230	0.544	0.491	0.657	0.495	0.418	**0.936**	0.469	0.095	0.298	0.601
COM2	It compensates me when my transaction is not completed but deductions were made	0.298	0.473	0.482	0.616	0.536	0.349	**0.929**	0.439	0.184	0.294	0.649
CON1	The bank is easily accessible by telephone number on the site	0.255	0.438	0.449	0.592	0.556	0.368	0.507	**0.824**	0.108	0.184	0.600
CON2	This site has customer service representatives available online	0.193	0.447	0.391	0.506	0.507	0.424	0.412	**0.871**	0.089	0.154	0.495
CON3	It offers me the ability to chat with a bank staff for direction	0.032	0.277	0.207	0.356	0.428	0.370	0.229	**0.708**	0.083	0.029	0.318
TS1	I have never lost money due to internet banking	0.250	0.043	−0.020	0.033	0.008	−0.010	0.054	0.026	**0.785**	0.150	0.059
TS2	My bank ensures that l do not loss my money	0.410	0.024	0.063	0.069	0.034	0.071	0.083	0.005	**0.846**	0.213	0.079
TS3	With Bank Verification Number (BVN) my money is protected	0.536	0.277	0.086	0.102	0.133	0.213	0.207	0.231	**0.770**	0.326	0.149
IS1	My bank protects information about my internet transactions	0.349	0.510	0.246	0.303	0.211	0.238	0.391	0.233	0.108	**0.795**	0.342
IS2	My bank does not share my personal information with other websites	0.442	0.364	0.231	0.222	0.114	0.104	0.250	0.073	0.112	**0.792**	0.232
IS3	My bank protects information about my credit card	0.586	0.356	0.111	0.160	0.08	0.254	0.147	0.087	0.436	**0.812**	0.168
CS1	I am satisfied with the internet service provided by my bank	0.294	0.263	0.279	0.625	0.322	0.208	0.503	0.417	0.087	0.206	**0.790**
CS2	I am pleased when using internet banking	0.271	0.404	0.498	0.576	0.518	0.343	0.523	0.605	0.038	0.188	**0.813**
CS3	Internet banking satisfies my expectations	0.230	0.544	0.491	0.557	0.495	0.418	0.736	0.469	0.095	0.298	**0.801**
CS4	My decision to use internet banking is a good one	0.298	0.473	0.482	0.616	0.536	0.349	0.729	0.439	0.184	0.294	**0.849**

Bold indicates that the items have higher loadings across the individual construct

Table 5 Heterotrait–monotrait (HTMT) ratios

Constructs	COM	CON	FU	IS	RE	RES	TS	WA	WD	WE
Compensation (COM)										
Contact (CON)	0.608									
Fulfillment (FU)	0.672	0.854								
Informational security (IS)	0.419	0.236	0.306							
Reliability (RE)	0.896	0.811	0.708	0.39						
Responsiveness (RES)	0.504	0.63	0.801	0.34	0.513					
Transactional security (TS)	0.189	0.206	0.153	0.391	0.122	0.192				
Website availability (WA)	0.663	0.59	0.834	0.337	0.696	0.755	0.163			
Website design (WD)	0.367	0.282	0.352	0.806	0.436	0.326	0.783	0.456		
Website ease of use (WE)	0.646	0.62	0.794	0.655	0.618	0.726	0.207	0.795	0.549	

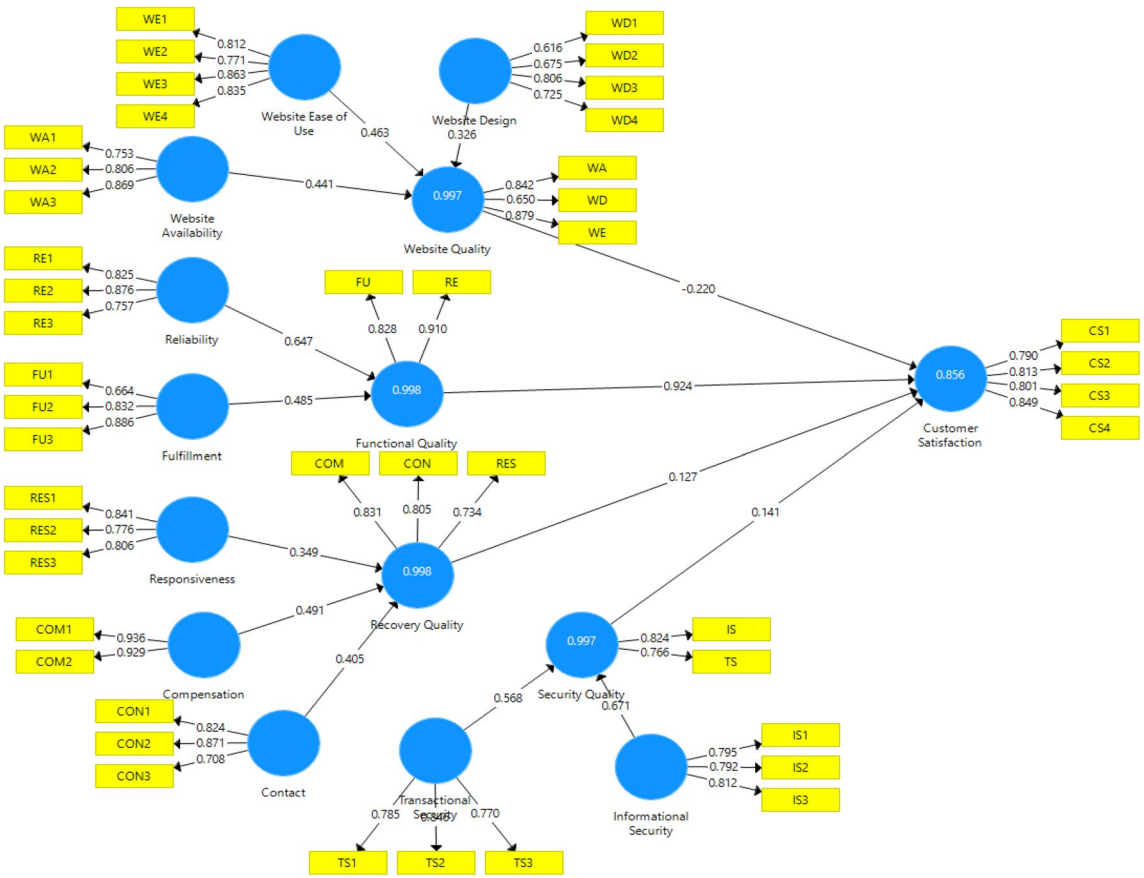

Fig. 2 PLS algorithms

Structural estimates

A bootstrapping technique on the PLS-SEM was carried out in order to specify the *t* statistics of the structural estimates. This is necessary to ascertain the significance of the relationships among the constructs and also to test the hypothesized relationships.

Table 6 shows the impact of the weights of the first-order construct variables on their corresponding second-order constructs. The results reveal that the weights of all the first-order constructs are significant at the 5% level ($P < 0.05$). This implies that each of the second-order constructs has significant dimensions. Further results indicate that 'website ease of use' has the highest weight among the three dimensions of 'website quality' (beta = 0.463); 'reliability' has the higher weight between the two dimensions of 'functional quality' (beta = 0.647); 'compensation' has the highest weight among the three dimensions of 'recovery quality'

Table 6 Relationships of the first-order constructs with their second-order constructs

Second-order construct	First-order construct	Estimates	*T* Statistics	*P* values
Website quality	Website availability	0.441	18.435	0.000
	Website design	0.326	9.603	0.000
	Website ease of use	0.463	21.385	0.000
Functional quality	Reliability	0.647	30.173	0.000
	Fulfillment	0.485	55.038	0.000
Recovery quality	Responsiveness	0.349	14.34	0.000
	Compensation	0.491	21.161	0.000
	Contact	0.405	22.473	0.000
Security quality	Transactional security	0.568	29.323	0.000
	Informational security	0.671	32.398	0.000

Table 7 Hypotheses testing

Hypothesized path	Beta	*T* Statistics	*P* values	Decision
Website quality → customer Satisfaction	−0.220	5.598	0.000	Supported
Functional quality → customer satisfaction	0.924	18.629	0.000	Supported
Recovery quality → customer satisfaction	0.127	2.570	0.010	Supported
Security quality → customer satisfaction	0.141	4.490	0.000	Supported

(beta = 0.491) while 'informational security' has the higher weight between the two dimensions of 'security quality'.

Table 7 reveals the results of the hypotheses testing. The results indicate that the four service quality dimensions significantly influence customer satisfaction. Hence, H1, H2, H3 and H4 were supported.

Discussion of findings

The findings indicate that there is a significant positive relationship between the e-service quality dimensions and their service quality indicators. With respect to the dimensions, website ease of use, reliability, compensation and informational security have the higher weight among the e-service quality indicators. This implies that the most important service quality dimensions of internet banking are ease of use, reliability, compensation and informational security or privacy. These findings did not corroborate the finding of Sindhu (2019) that responsiveness is the most significant dimension of internet banking e-service quality. Moreover, Das and Ravi (2021) found that website design is the most crucial dimension of e-banking service quality, but in this study, website ease of use was found to be more critical. The finding that reliability has a higher weight than fulfilment supports the finding of Narteh (2013).

The regression coefficient of the hypothesized path between website quality and customer satisfaction is negative (beta = − 0.22). This means that the quality of a website and customer satisfaction are inversely related, although the coefficient is significant at the 5% level ($P < 0.05$). The result that website quality has a negative impact on customer satisfaction contradicts Das and Ravi (2021) finding that website quality is positively related to e-banking customer satisfaction. The finding, however, confirms Ganjinia et al. (2013) argument that an internet banking system should not have sophisticated design with high graphics since it increases page load time and reaction time and might generate user discontent. According to Sakhaei et al. (2014), website design has less impact on consumer satisfaction. The idea is that the website design should be straightforward and simple to use as noted by Fariz and Bagher (2014). All elements on the website should be stated in simple and straightforward language so that most clients can grasp them. It should be precise and well organized, with no internet connections or allusions to unrelated information.

Furthermore, the hypothesized path coefficient between functional quality and customer satisfaction is positive (beta = 0.924) and significant at the 5% level ($P < 0.05$). This implies that functional quality has a direct and significant influence on customer satisfaction. This result is similar to the finding of Demyana (2014), Aruna (2018) and Sritharan and Ragel (2019). It was also shown that functional quality has the greatest influence on customer satisfaction. This means that for customers to be satisfied with internet banking, it should perform what it has promised to deliver.

Similarly, the coefficient of the hypothesized path between recovery quality and customer satisfaction is positive (beta = 0.127) and also significant at the 5% level ($P < 0.05$). This suggests that recovery quality has a direct and significant influence on customer satisfaction. These results are in line with Ganjinia et al. (2013), Ejigu (2016),

Sindhu (2019) and Sritharan and Ragel (2019). Thus, there should be effective handling of challenges and prompt compensation when the need arises.

Lastly, the coefficient of the hypothesized path between security quality and customer satisfaction is positive (beta = 0.141) and also significant at the 5% level ($P < 0.05$). The results are consistent with the findings of Aruna (2018), Sritharan and Ragel (2019) and Das and Ravi (2021). This result implies that the more secured internet banking is the higher the level of customer satisfaction.

Conclusion and implications

The study's goal was to determine the essential dimensions of internet banking service quality as viewed by General and Maritime services clients, as well as their influence on customer satisfaction. The outcomes of the study provided empirical evidence that service quality metrics have a substantial impact on customer satisfaction. The current state of the banking business in Nigeria necessitates an improvement in the service quality of e-banking channels, particularly internet banking. These data will help bank executives and industry regulators to evaluate internet banking service delivery and enhance client satisfaction.

The findings of the study have theoretical and practical implications. The study extended the process and outcome theory of service quality proposed by Gronroos (1984) and Narteh (2013). The Gronroos model explained service quality as a two-dimensional construct (functional and technical quality). Narteh (2013) extended the model to a three-dimensional construct (functional, technical and recovery quality). This study further extends the model to a four-dimensional construct (website, functional, recovery and security quality). In this study, technical quality is conceptualized as website quality. Due to the lack of face-to-face interaction with banks, the website is what customers using internet banking interact with and as such it can determine their perception of e-service quality. Moreover, security quality was added as one of the service quality measures to capture the fears that customers may likely have with internet banking. Based on the findings, the security dimension is a significant aspect of e-service quality and it has a significant impact on customer satisfaction.

The practical implications of the findings are that banks should design less sophisticated internet banking websites that are easy for all categories of customers to use. This is necessary because customers may eventually be discouraged from visiting the website if it is difficult to access or excessively slow. Banks should also provide internet banking services as promised. The services should be reliable, and the purpose for using the service should be fulfilled. Furthermore, banks should be more responsive in handling customers' complaints arising from the failure of internet banking to deliver as expected. Contact information should be available to customers to make complaints, and they should be compensated for transactional failures. In addition, banks should ensure that the personal information of their clients utilized for internet banking is not made available to third parties. Moreover, banks should make ongoing efforts to strengthen the security of their clients' transactions.

Limitations and future directions of the study

As is the case with any research, this study has some limitations. First, the full range of e-service quality dimensions was not examined. This is because the dimensions were based on the process and outcome theory of service quality. Future studies can incorporate other dimensions that are important in their study context. Second, the study used a quantitative approach. A qualitative approach may provide more insights into the dimensions of e-service quality that are important in the overall evaluation of e-service quality. Third, the number of respondents sampled is not too large. Despite these limitations, the findings of this study do provide valuable insights into several pertinent issues in bank marketing. It also provides a platform for future investigation.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest with any third for financial obligation as far as this article is concerned.

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