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Understanding drivers of self-service technologies (SSTs) satisfaction and marketing bottom lines: Evidence from Nigeria

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Understanding drivers of self-service technologies (SSTs) satisfaction and marketing bottom lines: Evidence from Nigeria**Chidera C. Ugwuanyi, Chukwunonso Oraedu, Chuka U. Ifediora, Ernest E. Izogo, Simplice A. Asongu & Ikechukwu J. Attamah****Abstract**

Whilst self-service technologies (SSTs) are novel and evolving, they have rapidly grown popular across various retail service settings. Having been introduced into the Nigerian banking space, the level of customers' satisfaction from the system is still unknown given that it has disrupted the initial service setup customers were used to. Utilising two theoretical perspectives, this study examined what drives customers' satisfaction with banks' SST and further assesses their influence on different marketing bottom lines. The study employed a quantitative approach to sampling 310 banks' SST users within a popular university in Eastern Nigeria. Using the PLS-SEM technique, the study found that the perceived ease of use and perceived control are strong drivers of SST satisfaction and other marketing bottom lines. Surprisingly, perceived usefulness was found not to influence SST satisfaction, and therefore present a unique result in this context. Based on the foregoing, theoretical and managerial implications were provided.

Keywords: Customer behaviour, Customer satisfaction, Technology Acceptance Model, Self-service technologies (SSTs), Stimulus-Response-Organism (S-O-R) Theory, Nigeria.

Introduction

Today's business world has noticed rapid acceptance of modern information technology (IT) devices in business activities. Manufacturers, retailers and service providers are increasingly considering innovative options for meeting customers' expectations and delivering value to customers (Oraedu *et al.*, 2021; Pham *et al.*, 2019). In line with this, business organisations are embracing and adopting various self-service technologies (hereinafter referred to as SSTs) as a veritable tool for meeting up with customers' demands and making up for human deficiencies in service delivery processes. The global usage of SSTs is projected to reach up to 31 billion users by 2020 (Kim & Yang, 2018). These new technologies have allowed customers to serve themselves and become co-creators of value through the production-consumption cycle (Mukerjee, 2020). In addition, SSTs have transformed the traditional service encounter, which a priori thrives on human-to-human interactions, to one mediated by technology (Kim & Yang, 2018), thus, posing a challenge to customer relationship management.

The banking industry has also joined the bandwagon in adopting SSTs as a means of exploiting economies of scale and easing customers' access to banking services (Mukerjee, 2020). However, Lin and Hsieh (2006) argue that although most customers, particularly in the western world, have conquered their fears of SSTs, some others, especially from the developing countries, still worry about using SSTs. Previous studies noted that users' anxiety, stress and unwillingness to accept innovative changes can result in the avoidance of IT-related systems and invariably accentuate dissatisfaction towards such systems (Ugwuanyi *et al.*, 2021; Curran *et al.*, 2003; Meuter *et al.* 2003). Generally, there is hesitation in adding SSTs to service delivery as Anand (2011) noted that some retailers who had earlier employed SSTs switched back to a human-to-human transaction in a bid to enhance customer service, while some customers were found to avoid SSTs where they existed. Undoubtedly, a lot of contextual issues can create SSTs dissatisfaction and ultimately make consumers avoid SSTs. For instance, in the Nigerian banking context, the increased online financial fraud, poor internet penetration, customers' inflexibility and low computer literacy, as well as the lack of confidentiality of personal information are among factors that can impact customers' adoption and continuous use of technology-based self-service (Wang *et al.*, 2020).

Customers have remained ambivalent in their evaluation of SSTs, partly because of the poor understanding of SSTs functionalities (Djelassi *et al.*, 2018). The rich contributions of

researchers in the SST domain have laid more emphasis on factors of initial adoption (Lin and Hsieh, 2006; Curran *et al.*, 2003), while less attention has been paid to consumption and post-usage evaluation (Robertson *et al.*, 2016), especially in an emerging context like Nigeria where SST is still a novelty. This, therefore, warrants further empirical scrutiny. Worst still previous SSTs studies are yet to sufficiently address the contradictory consumer perceptions on the usage of SST systems and how such evaluation affect marketing bottom lines. Bhattacharjee (2001) and Djelassi *et al.* (2018) argue that the role of customer satisfaction with such technological platforms is yet to be fully understood, particularly given the ripple effect of satisfaction on business survival, growth and success. Whilst a handful of studies (see, Djelassi *et al.*, 2018; Robertson *et al.*, 2016; Bhattacharjee, 2001) crisply offered insight on this area, in addition to deepening the understanding of SSTs satisfaction across different marketing bottom lines, the study noted that the emerging country perspectives with an emphasis on the sub-Sahara Africa are yet to be webbed into this key research area and it will be preposterous for retail banks in the sub-Sahara Africa to formulate policies on the bases of what is obtainable elsewhere. Oraedu *et al.* (2021) posit that a context-specific study is required especially if the idea is to implement a market strategy based on what has been uncovered from settings with different economic and cultural outlooks.

Therefore, this study takes a quantitative approach to enhance our understanding of SST satisfaction drivers across different marketing bottom lines. Specifically, this research makes three major additions to the SST literature. First, it focuses on the drivers of SSTs satisfaction, given that the introduction of SSTs into the Nigerian banking space disrupts the initial service delivery setting. We extended the technology acceptance model (TAM) in a bid to understand how perceived ease of use (PEOU), perceived usefulness (PU) and perceived control (PC) of SSTs impact customers' satisfaction. This is on the premise that TAM is useful in understanding the formation of behaviour towards technological platforms. Secondly, following the argument put forward by Bhattacharjee (2001) and the significance of customer satisfaction in the marketing discourse, the study seeks to understand the effect of satisfaction on three marketing bottom-lines: reuse intention, electronic word-of-mouth (eWOM), and trust, after the initial adoption of the SST systems. Finally, we sought to explore the role of the stimulus-organism-response (S-O-R) theory in the SST-banking context. Why? To enrich our understanding of how the theory can be utilised to either improve or impair the performance of the extended TAM model. Inasmuch as similar studies

may exist in the retail banking context, the market characteristics and behaviour differ between developed and emerging markets.

The rest of this paper is structured as follows: the review of related literature, theoretical framework and development of testable hypotheses. This was followed by the research methodology, data analysis and discussion of findings. Finally, the theoretical and practical contributions, limitations of the study and future research agenda were clearly explained.

Review of related literature

Conceptual background

Self Service Technologies (SSTs)

SSTs have been described as “technological interfaces that enable customers to produce service independent of direct service employee involvement” (Meuter *et al.* 2000, p. 50). This means that with SSTs, customers can effectively serve themselves in a particular service encounter without the active participation of the service employee. This appears to have involved customers more in the service encounter as co-creators of value (Mukerjee, 2020). The implication is that, where a customer is unable to fit in properly into the service set up, the entire service arrangement can be altered and this will affect whatever experience the customer will go back with. This, therefore, poses a challenge for both the service provider [as the creator of value] and the customer [as co-creator of value].

From the service providers’ perspective, SSTs seek to improve service delivery in terms of accuracy, speed and personalisation (Berry, 1999). Dabholkar (1996) noted that SSTs help to minimise operational costs while also increasing productivity. SSTs can also serve as a means of distinguishing a particular provider from a bunch of other competitors in the market (Kauffman & Lally, 1994). Curran *et al.* (2003) argue that SSTs are advantageous in standardising service delivery, as the mood and personal idiosyncrasies of the service provider that may impact the service delivery process are removed or minimised. Theoretically speaking, changes in the service delivery process are made to minimise customers’ active involvement. However, in our context, the reverse seems to be the case as bank SSTs have stretched the involvement level of customers in the service delivery schema, causing customers to expend more resources in terms of energy and time. SST implies that service provision is left in the hands of the customer and the high inseparability between the system and customers make customer relationship management critical. Thus, there is a need

to constantly monitor and examine the interaction between both parties, as the outcome can affect retail bank marketing bottom lines in terms of reuse intention, eWOM, and trust.

Theoretical framework and development of hypotheses

Stimulus-Organism-Response (S-O-R) Theory

The S-O-R framework developed by Mehrabian and Russell (1974) argues that the shopping environment contains factors known as stimuli (S) that affect organisms (consumers, O) and result in approach or avoidance response (R) behaviours towards the retail store [...], behaviours like store searching, intention to purchase, repurchase intention, loyalty and so on. Going by the original conceptualisation of the S-O-R framework, stimulus factors are only environmental cues within the retail stores (Mehrabian and Russell, 1974). However, based on the argument put forward by Izogo *et al.* (2017) and other established studies, stimuli are any actions or agents that cause a change or spur activity in an organism that can be intrinsic or extrinsic. This argument seems to suggest that stimulus is not limited to environmental cues as the originators proposed, but anything that activates some sort of response (Oraedu, 2019; Izogo *et al.* 2017). Therefore, it is not a surprise that recent and past studies have included environmental and non-environmental factors in their S-O-R frameworks (see e.g. Oraedu, 2019; Kim and Park, 2019; Kim and Lennon, 2013).

Accordingly, the organism factor is the arena that houses the information needed to influence behaviour (Oraedu, 2019). Based on the classical S-O-R framework, the organism is represented by affective and cognitive intermediary states and processes that mediate the relationship between the stimulus and response factors (Kim and Park, 2019). The output of the thought processes that occurred within the organism arena is what is given as the response, which could be to approach or avoid the retailer (Mehrabian and Russell, 1974). In our research model, we fundamentally drew on the TAM model to conceptualise the PEOU, PU and PC as stimulus factors. Attributed to these constructs are both environmental and non-environmental factors. Satisfaction was considered as the organism variable given that Homborg *et al.* (2006) posit that the cognitive and affective dimensions are involved in the formation of customer satisfaction and mediate the interaction between the stimulus and response factors (Kim and Park, 2019). Finally, trust, eWOM and reuse intention were modelled as response factors.

Technology Acceptance Model (TAM)

TAM is generally considered as an extension of the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980), and used to model attitude towards the acceptance or non-acceptance of any new technology system. The originator of the model proposed the TAM to explain why users accept or reject information technology (Davis, 1989). It also provides the basis upon which one traces how external variables influence belief, attitude and behavioural intentions (Ugwuanyi *et al.*, 2021; Davis *et al.*, 1989), thus, it aligns with the S-O-R framework. The classical TAM model proposed two cognitive factors: perceived usefulness and perceived ease of use. According to the model, users' adoption of technology is driven by perceived usefulness (PU) and perceived ease of use (PEOU), which influence users' attitudes towards the technology. Going by this explanation and the determinant factor, TAM is an important concept for SSTs adoption. The understanding of what drives customers' satisfaction with bank SSTs, and other marketing bottom lines align with the interdisciplinary nature of the TAM model as a tool for predicting users' behaviour.

Further, the uniqueness of the TAM model is its ability to fit into any technological study context, while also being able to accommodate other social factors. Venkatesh *et al.* (2007) noted that the TAM model gives room for a deeper study of related constructs and the integration of other social influences that can predict customers' usage behaviour towards new technologies. The study, therefore, contributes to the study of the TAM model by including the perceived control construct into the model. Our aim here is to explore the attitude of bank SST users who have control over the use of the system, as users who have control over their use of technology are likely to be more satisfied (Collier and Sherrell, 2010). Therefore, from the perspective of TAM, we modelled PU, PEOU and PC as antecedents of satisfaction and other marketing bottom lines, while from the theoretical lens of the S-O-R framework, these antecedents (PU, PEOU and PC) were simultaneously modelled as stimulus factors influencing customers' behaviours.

Drivers of Bank SSTs satisfaction: PEOU, PU and PC

DeOna *et al.* (2020) define satisfaction as the immediate evaluation of service experience. It is the feeling of fulfilment and meeting the customers' core needs (Oraedu *et al.*, 2020). In the SST context, Ugwuanyi *et al.* (2021) posit that satisfaction is the degree to which the bank SST meets customers' expectations of stress-free banking transactions. In this study, we

conceptualised satisfaction as the ability of the SST system to enable customers to fulfil their banking-related needs.

Perceived ease of use (PEOU)

The PEOU is defined as the ease with which customers can make use of a technology (Pham *et al.*, 2018). Davis (1989) contends that it is the extent to which users of technology expect it to be effort-free, such that the technology does not impede the users' achievement of their task. Customers are better disposed to technological platforms they perceive to be easy to use and less complex (Lin and Hsieh, 2011). As expected, complex systems can pose a great challenge for customers' usage (Robertson *et al.*, 2016). This may explain why Brandon-Jones and Kauppi (2018) found that PEOU is not directly related to a positive attitude towards e-procurement platforms in the study of the e-procurement system in a university in the Netherlands. On the contrary, the PEOU of technology influences the attitude towards that technology and the intention to adopt and use the technology (Davies, 1989). Hence, Ugwuanyi *et al.* (2021) found that PEOU is significantly related to customers' satisfaction in their study of SSTs experience in Nigeria. Liao *et al.* (2007) found that PEOU of online services influences customers' satisfaction. Robertson *et al.* (2016) found the ease of use to be associated with satisfaction in the study of different SST types in the Australian Football League (AFL). Meuter *et al.* (2003) noted technology design problems and ease of use deficiency as major sources of customer dissatisfaction in SSTs setup. Based on the available piece of evidence, we propose this replicable hypothesis:

H₁: Perceived ease of use of banks' SSTs has a direct and positive influence on customer satisfaction.

Perceived Usefulness (PU)

PU is defined as the ability of an IT platform to provide the expected customers' benefits (Giovanis *et al.*, 2018). Davis (1989) noted that it is the extent to which a person believes that using a given technology will enhance job performance. That is to say that bank customers approach SSTs with the conviction that it can help them fulfil their banking needs. Several studies have confirmed this claim. For instance, Bhattacharjee (2001) in the study of online bank customers in the United States found PU to have a positive influence on customer satisfaction. A similar study by Ugwuanyi *et al.* (2021) found PU to directly predict customers' satisfaction. Even in a complex setup like the e-procurement system, Brandon-

Jones and Kauppi (2018) found that PU is directly related to a positive attitude towards an e-procurement platform. Within the mobile commerce setting, Lee and Jun (2007) found a significant relationship between PU and satisfaction. Although an inconsistent result was obtained in Liao *et al.* (2007)'s study, but when compared with the unit of studies that established a linear relationship, the former seemed to abound. Thus, we propose a replicable hypothesis:

H₂: Perceived usefulness of banks' SST has a positive and significant influence on customer satisfaction

Perceived control (PC)

PC is generally regarded as the third force in the TPB model and a strong factor influencing behaviour towards an object (Ajzen, 1991). PC assesses if a customer has faith and confidence that is needed to engage in the behaviour (Ajzen, 1991). That is to say, PC aims to examine "one's ability to command and exert power over the process and outcome of a self-service encounter" (Collier and Sherrell, 2010, p. 492). From the SST perspective, PC refers to the customers' ability to call the shots and direct the pace of transaction, which include being able to determine the flow of information and the interaction level with the system (Collier and Sherrell, 2010).

Generally, PC means that the customer has the ability to personalise transactions instead of accepting a default or standardised arrangement, such that it can match the customers' desired result. Whilst this construct is important for SST development, limited emphasis has been placed on its relationship with the satisfaction construct, and empirical support is scarce. Nonetheless, a couple of studies noted that customers who perceived to have control over the use of SST viewed such technology from a positive light (Guo *et al.*, 2016; Ajzen, 1991). Collier and Sherrell (2010) in their survey of entertainment subscribers who use broad-band technology found that PC indirectly leads to customers' satisfaction. Zhu *et al.* (2007) found that increasing the interactivity of SST increases customers' perception of control and leads to a more positive interface evaluation. Thus, Robertson *et al.* (2016) found that PC is associated with interactive voice recording (IVR) and online SSTs satisfaction in the AFL. Based on Collier and Sherrell's (2010) study, it is a fact that "one of the strongest selling points for a customer to not only try but continue to use a self-service technology is the ability to control the transaction" (p. 503). Based on this limited result, we propose this original hypothesis:

H₃: Perceived control of banks' SSTs influences customer satisfaction.

Bank SSTs satisfaction on marketing bottom lines: trust, reuse intention and eWOM

Trust in the service provider

Trust is conceptualised as the extent to which consumers believe that their service providers act fairly (Park *et al.*, 2017). It is the belief that parties to a contractual relationship will not act opportunistically (Oraedu *et al.*, 2021; Izogo *et al.*, 2017), but must first rely on each other. Meuter *et al.* (2000) stated that users' trust is one factor that requires serious attention in technology-to-human interactions. This is because of the 'low touch' nature of its setup, coupled with the complexities and security issues associated with online service transactions. Clearly, the issue of indiscriminate charges, privacy intrusion, unauthorised access to financial details, and so on remain factors causing customers to distrust banks' SSTs. However, a high level of satisfaction has been associated with trust in a service provider within the South Korean retail industry (Park *et al.*, 2017). Robertson *et al.* (2016) have also found the AFL members' satisfaction with SSTs to have a significant effect on trust in the service provider. Tsao and Hsieh (2012) and Rose *et al.* (2012) respectively confirmed the positive and significant effect of satisfaction on trust while studying online retail customers. Thus, we propose the following replicable hypothesis:

H₄: Satisfaction with bank SSTs is positively related to customers' trust

SST reuse intention

Customer intention to reuse a service will ultimately depend on the outcome of the previous encounter with such service. The post-acceptance model further confirms that customers' reuse of an information system is a function of their previous satisfaction (Bhattacharjee *et al.*, 2008; Davis, 1989). Brandon-Jones and Kauppi (2018) stated that an individual's intention to reuse an e-procurement technology is influenced by their attitude towards the technology. Previous studies show that satisfaction is a strong driver of behavioural intention. For example, Collier and Sherrell (2010) found that satisfaction is a stimulating factor influencing customers' decision to reuse the broad-band SST for entertainment subscriptions. Robertson *et al.* (2016) also found satisfaction to be positively associated with AFL members' intention to reuse IVR and online SSTs. Rose *et al.* (2012) found that satisfied online shoppers have a higher propensity to undertake another purchase. Kim *et al.* (2019) noted that hotel guests who were satisfied with the smartphone App of the hotel were likely

to reuse the app. Bhattacharjee *et al.* (2008) stated that the customers' satisfaction level in the course of using information systems will affect their willingness to continue using the system. Based on this piece of evidence, we propose the following replicable hypothesis:

H₅: Customers' satisfaction with banks' SSTs has a significant influence on customers' reuse intention.

SSTs eWOM

Given the interconnection between SSTs and social networking sites, previous studies have noted the higher chances of using technological means to spread information about a company or its product (Oraedu *et al.*, 2021; Hudson *et al.*, 2015). With some SSTs and eWOM using similar tools such as the mobile phone and internet, there is a greater propensity of customers to utilise similar media (internet and mobile phones) to recount their experiences across their networks. A satisfied customer would evangelise about their experience and encourage their contact base to have a similar experience. In the light of this, past studies have shown that favourable word-of-mouth (WOM) occurs as a result of high satisfaction experienced by the customer. Robertson *et al.* (2016) found satisfaction to be positively associated with positive WOM intention across different SSTs in the AFL. In the Nigerian telecom sector, Oraedu (2017) found that satisfaction influences customers' attitudes in terms of positive eWOM. Also, within the brand relationship quality study that incorporated the satisfaction construct, Hudson *et al.*, (2015) found that social media-based relationship quality leads to positive eWOM communication. Tsao and Hsieh (2012) found otherwise, noting that satisfaction does not promote positive eWOM intention. Nevertheless, when compared with the unit of outputs that supports or contradicts the relationship claim between the satisfaction and eWOM constructs, the former seems to abound in extant literature. Therefore, we expect that satisfied bank SST users would spread favourable information to their contact base using their online platforms. Based on that, we hypothesise as follows:

H₆: Satisfaction with banks' SSTs has a positive and significant influence on customers' electronic word-of-mouth behaviour.

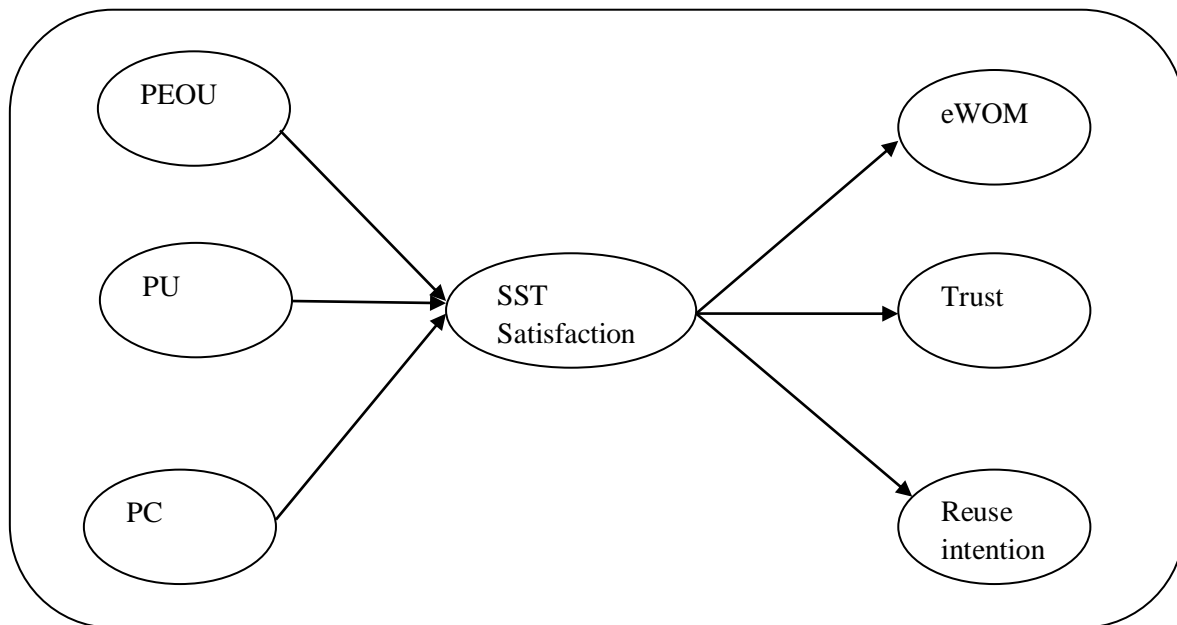


Figure 1: Conceptual framework

Research methodology

Measurement and questionnaire structure

The researchers adapted measurement items from earlier validated ones to ensure content validity and avoid wrong measurement (Saunders & Lewis, 2012). In this respect, the PEOU and PU were adapted from Davies (1989). PC which was measured on a three-item scale was adapted from Rose *et al.* (2012). Oraedu (2017) provided the basis for the measurement of eWOM. Also, trust and satisfaction were operationalised from Oraedu's (2019) study, while reuse intention was operationalised from Khalifa and Liu (2007). All the scale items (excluding demographics) were measured on a five-point Likert scale rating style which anchored on 1 – strongly disagree and 5 – strongly agree at both extremes. The scale items were face-validated by senior academics that specialised in marketing research and their input was considered before the final instrument was prepared. The questionnaire had a brief introductory note about the purpose of the study. Efforts were made to ensure that the recruited informants were active users of bank SSTs.

Data collection and sample characteristics

A survey method was adopted. The Google web survey form was utilised in creating the questionnaire. Respondents were purposively recruited from the University of Nigeria, Nsukka, Enugu, Campus, – a university in the South-eastern region of Nigeria. The choice of this data collection point is to ensure that recruited informants have the requisite knowledge of the subject under study. Moreover, our context has limited research culture and the Google survey form is a novel approach in our setting. Hence, this care was taken to ensure the soundness of our data. In total, 310 bank SST users were recruited through some selected social media groups and email channels established within the university community. A total of 268 responses were received, out of which 8 responses were eliminated because of omissions in some of the worded items. In total, 260 responses representing an 84% response rate were valid and usable. This number was subjected to descriptive and other diagnostic and hypotheses tests. Table 1 presents the details of respondents’ demographics.

Table 1: Respondents' Demographic Profile

Category	Options	Frequency	Percent %
Gender	Male	142	54.6
	Female	118	45.4
Marital Status	Single	211	81.2
	Married	49	18.8
Age	< 20 years	27	10.4
	20-35 years	209	80.4
	36-50 years	20	7.7
	>50 years	4	1.5
Duration of SST use	< 2 years	48	18.5
	2-5 years	108	41.5
	>5 years	104	40.0
Educational Qualification	WASSCE/NECO	119	45.8
	NCE/Diploma	34	13.1
	HND/BSc	79	30.4
	Postgraduate	28	10.8
Monthly Income	Below ₦50,000	142	54.6
	₦50,000-₦100,000	66	25.4
	₦100,000-₦150,000	18	6.9
	₦150,000+	34	13.1
Total		260	100.0

Note: \$1=₦360

Analyses and Results

We subjected the dataset to series of diagnostic tests to ensure it did measure what it was expected to measure before the structural model test. This was achieved with the aid of the SmartPLS-SEM software. We preferred the PLS-SEM technique over the covariance-based SEM (CB-SEM) approach because of its appropriateness for making predictions (Hair *et al.*, 2014). Also, the PLS-SEM procedure is suitable for non-normal data and small- or medium-sized samples (Hair *et al.*, 2014). Our sample is medium-sized and our model inferred a causal-effect relationship. Thus, PLS-SEM is considered most appropriate for estimating our research model.

Psychometric properties of the measurement model

We adopted a two-step approach to assess the validity and reliability of the indicators as Hair *et al.* (2014) recommended. But, we first examined the instrument for model fit and factor analysis, and then, established its validity and reliability afterwards. Output from the measurement model examination indicated a satisfactory fit for the data. A standardised root mean square residual (SRMR) value of 0.077, which is consistent with the established limit of acceptability for PLS models, is an indication that the model is free from misspecification issues (Hu & Bentler, 1999). But in contravention of the 0.90 minimum threshold proposed by Byrne (2013), our normed fit index (NFI) value was 0.739. However, this is not considered a major source of worry because the use of NFI in PLS-SEM is still rare and contentious (Henseler *et al.*, 2016). To assess the instrument's reliability, we adopted two measures – Cronbach alpha and composite reliability. Also, convergent and discriminant validity were measured.

In line with the above, the 25 scale items were simultaneously factor-analysed (Principal component analysis – PCA) using the SmartPLS software. The output in Table 2 shows that the entire factor loadings range from 0.545 - 0.922, which are above the 0.5 minimum cut-off limit (Hair *et al.*, 2014) and loaded significantly at $p < 0.05$ (Bagozzi and Yi, 1988). As shown in Table 2, both the Cronbach alpha and composite reliability scores surpassed the 0.5 minimum thresholds for moderate reliability (Hilton *et al.*, 2004), thus implying that the indicators of the latent constructs are reliable and internally consistent.

Table 2: Items' Factor Loadings, *t*-Statistics, Reliability and Variance Inflation Factors (VIF) Outputs

Constructs	Indicators	Factor Loadings	<i>t</i> -value	Cronbach alpha (α)	Composite reliability	VIF
Perceived ease of use	PEOU1	0.755	19.306***	0.743	0.829	1.517
	PEOU2	0.545	7.206***			1.208
	PEOU3	0.704	13.527***			1.529
	PEOU4	0.758	20.101***			1.569
	PEOU5	0.733	17.944***			1.377
Perceived usefulness	PU1	0.786	25.044***	0.813	0.877	1.620
	PU2	0.821	33.286***			1.715
	PU3	0.794	26.166***			1.703
	PU4	0.800	23.205***			1.785
Perceived control	PC1	0.636	9.884***	0.717	0.845	1.119
	PC2	0.880	32.405***			2.397
	PC3	0.879	34.548***			2.402
Satisfaction	SAT1	0.785	29.862***	0.756	0.860	1.379
	SAT2	0.823	32.403***			1.627
	SAT3	0.851	41.175***			1.696
Electronic word-of-mouth	EWOM1	0.874	44.949***	0.786	0.873	1.706
	EWOM2	0.874	34.077***			1.992
	EWOM3	0.751	14.328***			1.500
Trust	TR1	0.861	39.105***	0.856	0.913	2.087
	TR2	0.922	90.620***			2.695
	TR3	0.860	40.983***			2.019
Reuse Intention	RUI1	0.824	18.121***	0.855	0.902	1.987
	RUI2	0.874	50.245***			2.250
	RUI3	0.857	34.601***			2.134
	RUI4	0.783	19.952***			1.702

Note: Significant levels are denoted as *** $p < 0.05$; *PEOU*= perceived ease of use; *PU*= perceived usefulness; *PC*= perceived control; *SAT*= customer satisfaction; *EWOM*=electronic word-of-mouth; *RUI*=reuse intention, *TR*=trust, *VIF* = Variance inflation factor.

In line with Hair *et al.* (2014) recommendation, construct validity is attained when both convergent and discriminant validities are met. Convergent validity is attained if the average

variance extracted (AVE) is 50% or above and the reflective indicators load significantly on their respective theorised constructs (Bagozzi & Yi, 1988). As shown in Table 3, the AVE of all the constructs ranges from 0.50 to 0.78 with a significant *t-value* at $p < 0.05$ level. The *t-values* were obtained by the bootstrapping resample procedure of 5,000 sub-samples as suggested by Hair *et al.* (2014). Hence, convergent validity was achieved.

Table 3: Construct AVEs, Correlations and Discriminant Validity

	AVE	EWOM	PC	PEOU	PU	REUSE	SAT	TRUST
EWOM	0.70	<i>0.84</i>						
PC	0.65	0.21	<i>0.81</i>					
PEOU	0.50	0.20	0.46	<i>0.70</i>				
PU	0.64	0.16	0.38	0.58	<i>0.80</i>			
REUSE	0.70	0.24	0.35	0.49	0.48	<i>0.83</i>		
SAT	0.67	0.56	0.45	0.43	0.35	0.37	<i>0.82</i>	
TRUST	0.78	0.50	0.39	0.33	0.35	0.40	0.72	<i>0.88</i>

Note: Square roots of AVE are in bold italic print in the diagonal; all correlations are significant at $p < 0.05$; PEOU= perceived ease of use; PU= perceived usefulness; PC= perceived control; SAT= customer satisfaction; EWOM=electronic word-of-mouth; RUI=reuse intention, TR=trust

Similarly, discriminant validity is established if each construct shares variance with its assigned indicators more than other constructs (Fornell and Larcker, 1981), and the cross-loading on the primary factors load way higher than the loading on the secondary factors. Table 3 shows that the square root of the AVEs (0.70 to 0.88) was far above the highest correlation pair. Also, the cross-loading was satisfactory, as the loading on the primary factors were way higher than what loaded on the secondary factors. For the sake of presentation parsimony, the cross-loading output was not reported but can be provided on request. Based on these findings, we conclude that the psychometric measure of our model is satisfactory because the model fit for the data, and construct validity and reliability were all fulfilled. Additionally, as indicated in Table 2, the path estimation is not affected by multicollinearity because all the variance inflation factor (VIF) values were well below 5 which is the maximum acceptability threshold recommended by Hair *et al.* (2017).

Structural output and test of hypotheses

The proposed model and research hypotheses were tested using the PLS-SEM technique. This was achieved through the bootstrapping re-sampling procedure of 5,000 sub-samples as recommended by Hair *et al.* (2014). The structural result shows that all hypotheses except H_2

was supported at the 0.05 level of significance (see, Table 4). Specifically, PEOU was found to be positively and significantly related to satisfaction ($\beta = 0.224, t = 3.214, p < 0.05$). PU did not significantly predict satisfaction ($\beta = 0.108, t = 1.769, p < 0.05$), even though the path coefficient was within the limit of acceptability. PC on the other hand had a direct effect on satisfaction ($\beta = 0.302, t = 4.363, p < 0.05$). Further, satisfaction was found to have a positive and significant effect on eWOM ($\beta = 0.596, t = 11.460, p < 0.05$), trust ($\beta = 0.675, t = 16.149, p < 0.05$), and on reuse intention ($\beta = 0.141, t = 2.457, p < 0.05$).

The total variance (R^2) extracted from the endogenous variable shows that satisfaction accounted for approximately 27%. This result came to be as a result of the combined efforts of PEOU and PC. Similarly, the entire model showed reasonable outputs in terms of the amount of variance extracted on the respective marketing bottom lines, with approximately 32% on eWOM, 54% on trust and 32% on reuse intention. These variances were explained by the contributory power of satisfaction and other bunch of antecedents. Conclusively, the outputs of our final model were modest, because they were well above 30%. Additionally, consistent with the criteria outlined by Hair *et al.* (2017), the Q^2 values (see Table 4) helped us establish the predictive relevance of our model. The analysis was completed with an omission distance (D) of 7. The outputs which ranged from 0.093 to 0.401 indicates that the predictive relevance of our model lies within the medium and large thresholds.

Table 4: Estimated results of the structural model and hypotheses test outputs

	Hypothesized relationships	Path coefficient	Standard error	t-value	Result
<i>Direct effects</i>					
H_1	PEOU→SAT	0.224	0.072	3.214***	Supported
H_2	PU→SAT	0.108	0.063	1.769 ^{ns}	Not supported
H_3	PC→SAT	0.302	0.070	4.363***	Supported
H_4	SAT→EWOM	0.596	0.051	11.460***	Supported
H_5	SAT →TRUST	0.675	0.042	16.149***	Supported
H_6	SAT→RUI	0.141	0.058	2.457***	Supported

Notes: Significant level is denoted as *** $p < 0.05$, ^{ns}-not significant, Q^2 for SST satisfaction, eWOM, trust, and reuse intention are 0.174, 0.208, 0.401, and 0.093 respectively

PEOU= perceived ease of use; PU= perceived usefulness; PC= perceived control; SAT= customer satisfaction; EWOM=electronic word-of-mouth; RUI=reuse intention, TR=trust

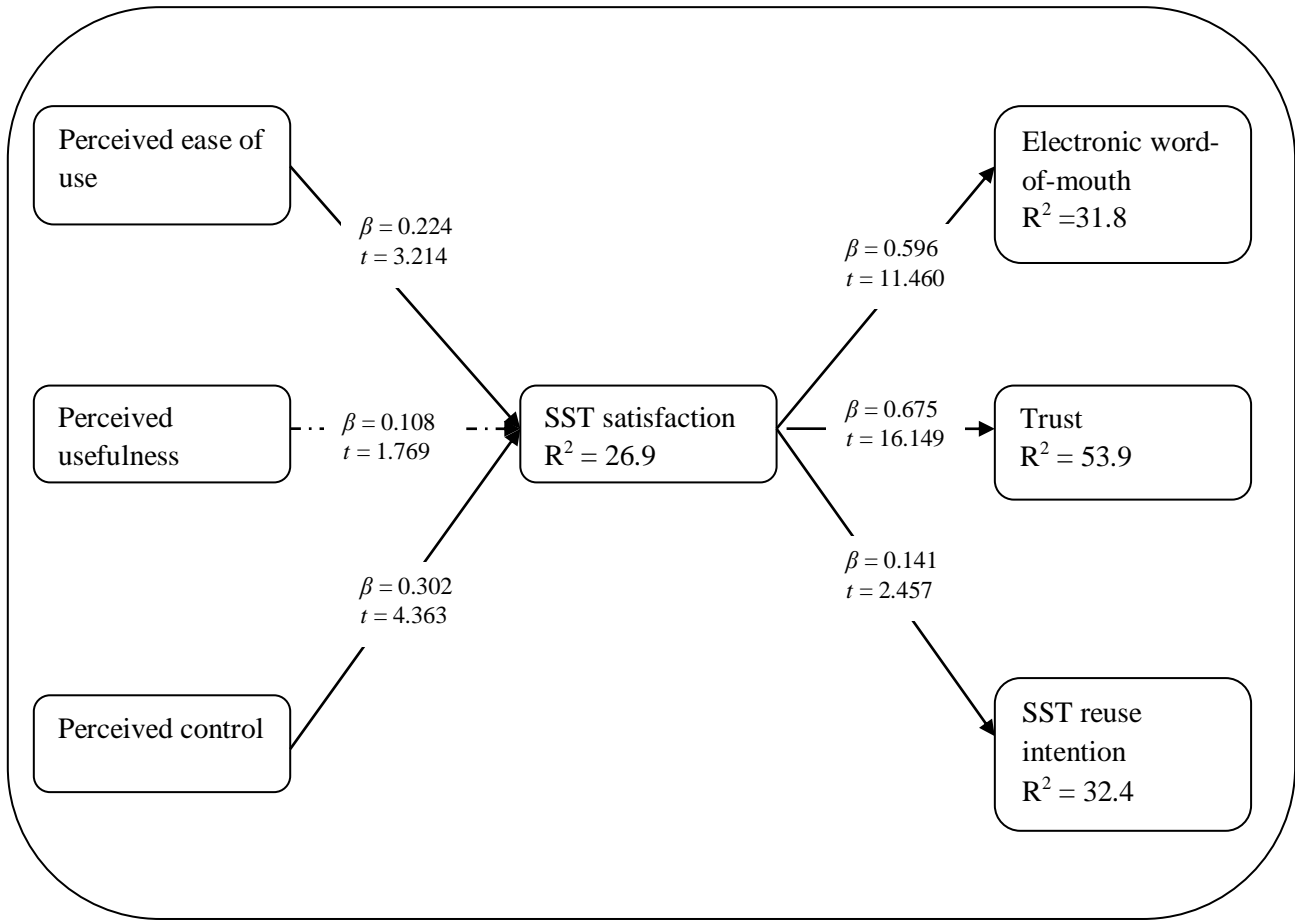


Figure 2: Structural model

Key:

Significant \longrightarrow

Not significant \dashrightarrow

Note: $\chi^2 = 846.640$ ($p < .001$), $\chi^2/df = 1.926$; $df =$ degree of freedom; normed fit index (NFI) = .739; standardized root mean square residual (SRMR) = 0.077.

Additional Analysis

Oraedu (2019) argues that some organism and response factors can play dual roles in the S-O-R arena. Thus, we took the analysis a step further to ascertain if the stimulus factors (that is, the extended TAM constructs (PEOU, PU and PC) will impact the response factors (trust, reuse intention and eWOM) without the influence of the organism factor (satisfaction). In this respect, we tested hitherto not hypothesised relationships. Clearly, we estimated the direct links between PEOU, PU and PC on the three marketing bottom lines under investigation – that is trust, reuse intention and eWOM. The result of our analysis shows that PU is positively

related to trust ($\beta = 0.127, t = 2.554, p < 0.05$), PEOU positively relates to reuse intention ($\beta = 0.235, t = 3.108, p < 0.05$), and PU directly relates to reuse intention ($\beta = 0.274, t = 4.148, p < 0.05$). The rest of the direct relationships were not supported.

Conclusion

The purpose of this study was, first to examine the drivers of banks' SST satisfaction and to ascertain the influence of satisfaction on different marketing bottom lines. The study adopted two theories that have proven to be effective in influencing consumer behaviour: the S-O-R theory and the TAM. We adapted the TAM and exploited its suitability in accommodating other social forces or variables that can influence behaviour. Hence, we extended the TAM by integrating the perceived control construct into it. Specifically, PEOU, PU and PC were modelled as drivers of SST satisfaction on the one hand, and as stimulus factors in the S-O-R framework on the other hand. Trust, reuse intention and eWOM were all modelled as the response factors in the S-O-R framework and as the outcome of SST satisfaction and its antecedents.

Findings from the study demonstrate that PEOU and PC are strong drivers of SST satisfaction. These results, therefore, support the claim by Robertson *et al.* (2016) who found the ease of use as an important factor influencing AFL membership's satisfaction in both online and IVR SSTs. The study confirmed the role of ease of use in influencing satisfaction. Thus, customers would be more favourably disposed to banks' SSTs that are effort-free and less complex. This explains why Ugwuanyi *et al.*, (2021) noted that technologies that are easy to use send a signal to the user that the provider is devoted to helping them accomplish their task without stress.

Furthermore, our study supports the proposition made by Collier and Sherrell (2010) that "one of the strongest selling points for a customer to not only try but continue to use a self-service technology is the ability to control the transaction" (p. 503). In our case, PC came out as the strongest factor influencing SST satisfaction. The implication is that customers expect to be in control of their transactions, as to dictate the flow of services and personalise their transactions, thereby reflecting their specific needs. This is as expected given the low human touch and the need to co-create value in this nature of services. Hence, Liao *et al.*, (2007) suggested that while developing SSTs, firms should put in place facilitating conditions and target users' self-efficacy attributes that would help users be in control of the system. Surprisingly, we found that PU did not directly lead to customer satisfaction. However, this

result is not out of touch with reality as a similar result was reported in Liao *et al.*, (2007) and Ugwuanyi *et al.*, (2021), but contradicts what was reported in Bhattacharjee's (2001) study of online bank customers in the US. A simple explanation for this result could be that bank customers expect the usefulness of SSTs to be a basic requirement, thus, they are interested in other attributes that may stimulate their feeling of fulfilment. Although in our context, most observed complaints about SSTs have more to do with network-related issues and service failures. This could be the reason why customers rated this relationship poorly, because even though their relationship is not significant, the path coefficient between both constructs was poor, but still within the limit of acceptability.

In terms of marketing bottom lines, our study found that SSTs satisfaction leads to customers' eWOM recommendation, reuse intention, and trust in the service provider. As expected, the study supports the claim that a satisfied customer would drum support for the service provider, encourage their friends and followers to subscribe for a similar experience. This result has been shared by Robertson *et al.* (2016), Oraedu (2017) and Oraedu *et al.*, (2021). The implication for bank managers is to contrive and streamline factors that will result in a positive rating for them, focusing on the SST antecedents identified in this study. Unsatisfactory experience from the customer could spell doom for the bank and trigger some unpleasant comments about it and its services.

Further, satisfied customers are certainly going to come back again and will wish to experience more. Although the study found a positive relationship between SST satisfaction and reuse intention, the path association between them is weak. The uniqueness of our context may be a possible reason for this result because most established studies noted that satisfied customers have a higher propensity to reuse SSTs (Kim *et al.*, 2019; Robertson *et al.*, 2016). However, it depends on the level of satisfaction. Bhattacharjee *et al.* (2008) noted that customers' satisfaction level in the course of using information systems will affect their willingness to continue using the system. In our case, the weak variance obtained in the satisfaction construct ($R^2=26.9\%$) may have contributed to this result. Nevertheless, customers' satisfaction is one factor that bank managers should not take lightly, considering that the outcome of its evaluation will influence customers' future behaviour. Finally, on the marketing outcome, trust came out as the strongest outcome amongst other outcomes investigated in this study. This is as expected because of the low human touch of SST banking. Meuter *et al.*'s (2000) emphasised the central role of building trust in technology-to-

human interactions. Trust is especially important in our context because of financial security and other privacy-related issues. The easiest way bank managers can develop, build and maintain trust is by ensuring that customers are satisfied. As they continue to experience higher satisfaction, their level of trust in the provider will continue to grow.

Theoretical contributions

This study makes several theoretical contributions to the mainstream service marketing and SST literature. First, the paper demonstrates the combined strength of the TAM model and S-O-R framework in influencing consumer behaviour. The classical S-O-R model argues in favour of only environmental cues as stimulators of behaviour (Mehrabian and Russell, 1974). However, based on our result, we corroborate the proposition of a few published studies (see, Oraedu, 2019; Izogo *et al.* 2017) and argue that stimuli are not limited to environmental cues, but are also any actions or agents that cause an intrinsic or extrinsic change in an organism. Additionally, the paper corroborates with Oraedu (2019)'s study to challenge the existing tenet of the S-O-R framework. Thus, we demonstrate that the stimulus factor can directly predict the response factor without the mediating influence of the organism factor. However, this was not in all cases, because only three out of the nine relationships examined were found to be positive and significant.

Further, we extended the TAM by integrating another social factor that influences behaviour. Venkatesh *et al.* (2007) noted that the TAM model gives room for a deeper study of related constructs and the integration of other social influences that can predict customers' behaviour towards the usage of new technologies. We, therefore, contribute to the study of the TAM by extending the perceived control construct into the model. This is on the premise that customers who perceived to be in control of their SST usage showed a higher satisfaction level (Guo *et al.*, 2016). Going by our conceptual framework we demonstrate that PEOU, PU and PC can be simultaneously modelled as antecedents of SST satisfaction and stimulus factors in the S-O-R arena. Also, trust, reuse intention and eWOM were simultaneously modelled as outcomes of SST satisfaction in the TAM and as response variables in the S-O-R framework, with satisfaction as the organism factor.

Practical implications

Whilst the usage of banks' SST is novel and still evolving in our context, the initial challenges experienced by customers have contributed to its slow pace of development.

However, this trend is likely to change because of the coronavirus (COVID-19) pandemic, as customers have limited opportunities to use the banking halls to perform their banking transactions. Accordingly, retail banks are now pressured more than ever to make sure that SSTs become effective. This study, therefore, provides deeper insight into what is important to customers as far as SSTs are concerned. Our result shows some actionable points that must be implemented by retail banks while rolling out SSTs.

Specifically, retail banks should endeavour to develop SST systems that are easy to use and do not stress customers mentally and physically. Customers are more inclined to using SSTs that offer them stress-free and seamless experiences. SSTs that are complex and difficult to use would not enhance customers' satisfaction. Also, retail banks should think of the level of control they wish for the customer to have in the service setup. Indeed, consumers always want to be in control of their financial activities. As a matter of fact, perceived control is the strongest factor found to influence SST satisfaction. This re-echoes Collier and Sherrell's (2010) viewpoint that the strongest selling point for banks is for their customers to be in control of SSTs. That is being able to customise their transaction and dictate the flow of activities instead of following a standardised service setup. These factors are very important in boosting customers' satisfaction levels. Therefore, bank managers should consider and target users' self-efficacy attributes that will help customers remain in control of the SST system (Liao *et al.*, 2007). Satisfied customers are better positioned to sing praises of their bank and drum support for them. Also, chances are that they will continue to use the system because they have come to trust the service provider and are assured that the provider has their best interest at heart. Going by the weak result on reuse intention occasioned by the weak variance in satisfaction, we suggest that retail banks should consider other innovative attributes that would delight their customers.

Limitations and future research agenda

The result of this finding must be interpreted with caution. First, this study focused on SSTs in a single retail banking setting of a developing economy – Nigeria. Although our country shares a similar history with those of other sub-Saharan African countries, findings from this study cannot be generalised to represent the case of other contexts and service sectors. As a future research avenue, we suggest that a comparative study may offer an idea of the outlook of SSTs in other emerging economies. Additionally, SST deployment and usage is still evolving across our contexts and this is posing a challenge to the existing tenets of

relationship in our context. Hence, we suggest that future studies look into the human-to-technology relationship and how it affects relationship quality. Further, familiarity with technological systems take time and different stages, consequently, a cross-sectional survey such as ours may not uncover some salient factors needed for SST improvement. We, therefore, suggest that future studies look into a longitudinal survey that may help uncover other factors that can affect marketing bottom lines. Finally, considering that we modelled SST reuse intention as an outcome variable, we suggest that future studies measure actual SST reuse, as some intentions may never translate to actual reuse.

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Appendix

Measurement scale

Perceived ease of use

1. It is quick and easy to perform transactions using the bank's SST.
2. It is easy to become skilful in the use of the bank's SST.
3. Learning how to use banks' SST does not take too long.
4. The use of banks' SST allows me to easily perform my banking transaction.
5. I find banks' SST easy to use.

Perceived usefulness

1. Using banks' SST in my transactions would enable me to do it more quickly.
2. I find banks' SST useful in meeting my banking needs.
3. Banks' SST makes my banking transactions easier to accomplish.
4. Use of banks' SST is useful in performing my transaction

Perceived control

1. I have the resources, knowledge and abilities to make use of bank SST.
2. Using the banks' SST is entirely within my power (control).

3. I feel in control of my information using SST.

Satisfaction

1. Overall, I'm satisfied with banks' SST.
2. The SST offered by my bank exceeds my expectations.
3. Banks' SST performs excellently well.

Electronic word-of-mouth (eWOM)

1. I say positive things about my bank SST through social media platforms.
2. I use online platforms to recommend the banks' SST to anyone seeking my advice.
3. In my online discussions, I say positive things about the SST offerings of the banks' SST.

Trust

1. My bank can be relied upon to perform as expected.
2. I have great confidence in my bank.
3. Overall, my bank service provider is honest.

Reuse intention

1. I'm most likely to use banks' SST soon.
2. I intend to continue using banks' SST.
3. I expect to perform banking transactions using banks' SST shortly.
4. The probability that I will use banks' SST again is high.