Finance & Banking Studies

IJFBS, VOL 6 NO 3 ISSN: 2147-4486

Interrelationships and consequential effects among technological innovation, service consistency, customer satisfaction and loyalty in banking

Asare Yaw Obeng,

PhD. Computer Science Department,Kumasi Technical University, Kumasi, Ghana
School of Computing, University of South Africa, Johannesburg, South Africa
Tel No: +233-200-553-550

Peter L Mkhize

Prof. School of Computing, University of South Africa, Johannesburg, South Africa

Abstract

The key to long-term success in banking is consistent improvement and delivering of quality product and or value-added service that conform to the expectations of customers. IT-innovative products/services and processes (technological innovation) facilitate these key elements of customer satisfaction and critical factors for retaining valued customers. The objective of this paper is to explore the effects of technological innovation on service consistency and the consequential effects on customer satisfaction and loyalty covering seven universal banks in Ghana. The results of the empirically tested model reveal new/improved product/process functionalities, service consistency and innovative product/process satisfaction contribute significantly to customer loyalty (p < 0.001). Service consistency has a marginal higher impact (β = .373) on customer loyalty than the others. Product/process quality contributes significantly (with β ranging from .345 to .742 and p < 0.001) to each of the above three antecedents than all other items.

Key Words: *Banking, customer loyalty, customer satisfaction, regression analysis, service consistency, technological innovation*

JEL classification: *G20; O00; O33*

Introduction

The Ghanaian banking industry is fairly saturated with 33 universal banks, 140 rural and community banks, 576 microfinance institutions, and 65 non-banking financial institutions including finance houses, savings and loans, leasing and mortgage firms (BOG, 2016). This culminated with the desire to acquire customers from the over 60% unbanked Ghanaian population (WB, 2014) has brought stiff competition to the industry. The key to long-term success is consistent improvement and delivering of quality product or service to customers. It is incumbent on management to assess factors that could influence their efforts to streamline innovative functional systems (Chen & Tsou, 2007); and accelerate innovation to offer individualized, short-lived, and information-rich niche products and services to new generations of clients with distinct technological preferences, attract unbanked adults, enhance customer relationship and retain existing customers.

Many banking firms in Ghana are realigning their current business strategies to include innovation due to the increasing demand for service quality through better product offering and value-added services. These firms are maximizing their IT-innovation capabilities as unique and valuable resources (Wu & Chiu, 2015) to remain competitive. Quality innovative products and services are key elements of customer satisfaction and critical factors for retaining valued customers (Parasuraman et al., 1985; Tseng et al., 2015). Innovative products are unique, improve ease of use for consumers, and result in a positive customer experience (Damanpour, 2010; Nemati et al., 2010). Banks pursue process innovation to decrease the cost of operation (Damanpour, 2010), increase quality (OECD, 2005), and to reduce service delivery time and increase operational flexibility (Walker, 2008). The consistency of delivering these expected services attributes to customers is an important evaluation factor of service (Shostack, 1987) and antecedent to satisfaction and loyalty (Iacobucci et al., 1995). Academic literature reports the capability of innovation in driving the reputation and customer loyalty of banks (Gupta & Malhotra, 2013).

Presently, most banks deliver customer service through technology. However, studies on the impact of technological innovation on service consistency and the ensuing effects on customer satisfaction and loyalty in banking are rarely studied. The full extent of the interrelations among the dynamic and numerous antecedents of customer satisfaction and loyalty have not been completely understood (Taylor et al., 2006). In an attempt to contribute to our understanding and exploration of relevant factors that relatively influence customer satisfaction and loyalty, the present study proposes a model with technological innovation and service consistency as the main antecedents.

Literature Review

IS-Technological Innovation in Banking Firms

With liberalized domestic banking regulations, intensified competition, and increasing consumer sophistication in Ghana (Asante et al., 2011), it is increasingly becoming difficult to differentiate between firms in line with products/services they offer (Baba, 2012). Banking firms are relying on technology-driven strategies and are leveraging on the advancements in information technology to develop new or significantly improved products and/or services (innovation) (OECD, 2005) to improve product quality (Anderson et al., 2014), foster self-service among customers (Chen, 2005), and achieve operational efficiency and service quality (Parasuraman, 2010) to remain competitive. For service organizations, innovation is a core competency (Kandampully, 2002).

Innovation efforts that focus on processes and products are classified as technical (Damanpour, 2010). Product innovation work is effectiveness-driven that mainly focuses on market needs and ultimately external customers (Bergfors & Larsson, 2009). Product innovation effort is to improve customer service, respond to customers' demand for new/improved products or executives' desire to capture new markets (Damanpour, 2010). Process innovation focuses on new or significantly improved method of production or method of delivering a service including significant changes in techniques, equipment and/or software (OECD, 2005). Process innovation has been a transformational force for the banking industry as it improves business in ways that are consistent with its strategy and maximize value for customers (Davenport, 1993). Product and process innovation complementarity is the "single best strategy"

(Damanpour, 2010). Banks pursue process innovation to decrease the cost of operation (Damanpour, 2010), increase quality (OECD, 2005), and to reduce service delivery time and increase operational flexibility (Walker, 2008).

In banking, information technology facilitates most technological innovations that mainly consist of processes and intangible products. Much of the innovation that has been adopted as business practice relies heavily on information technology (IT) for practicality (Bassellier & Benbasat, 2004). IT has brought a complete paradigm shift to the Ghanaian banking industry in a bid to catch up with global development, improve the quality of customer service delivery, reduce transaction cost, and deliver a wide range of value added products and services (Aliyu & Tasmin, 2012). Banks in Ghana are leveraging on the advancements in information technology to develop new or improve delivery channels, banking processes, products and/or services such as Automated Teller Machines (ATMs), Personal Computer Banking, Telephone Banking, Electronic Funds Transfer (EFT), Branch Networking, Electronic Data Interchange(EDI), Mobile and Internet Banking, Electronic Wallets, Electronic Platform, and eAlerts. Managers are successfully introducing IT-innovative products and services that are unique, improve ease of use for consumers, and result in a positive customer experience (Nemati et al., to the market far in advance of consumers' expectation (Kandampully, 2002). New product success impacts first on non-financial aspects of corporate performance including increased customer satisfaction and gaining new customers (Gunday et al., 2011). Providing high quality innovative services would improve customer satisfaction in the banking industry (Tseng et al., 2015). However, customer-focused strategic orientation research tends to investigate retention, loyalty, and benefits obtained from existing customers with little or no effort to address the contribution of innovation to customer satisfaction, customer loyalty (Pan & Zinkhan, 2006), and service consistency.

Firms with greater innovativeness have the capabilities to develop new or improve product or services in responding to the needs of customers (Gunday et al., 2011). Considering the relationship between innovation and customer, innovations addresses the service the customer needs or the interaction processes with the customer in service delivery. Banks accommodate customer preferences by following proactive innovation approaches to offer quality services using technology interface (Parasuraman, 2010). Through innovation, banks are able to perform *consistently* and become agile in addressing the needs of customers that result in customer satisfaction (Abdullah et al., 2010).

Customers valuing the uniqueness of innovation reduces price sensitivity of demand and banks can benefit from high brand loyalty of buyers (Lieberman & Montgomery, 1988). Benefits of innovation such as product or service differentiation and customer loyalty outweigh the risks, uncertainty, and high costs of innovation (Rosenbusch et al., 2011). Academic literature reports the capability of innovation in driving the reputation and customer loyalty of banks (Gupta & Malhotra, 2013). This reflects collective judgments of customers of their evaluation of the bank's ability to be innovative (Foroudi, Melewar, & Gupta, 2014). Technological innovation is one of the most critical strategy that can sustain the long-term success of a firm (Kandampully, 2002) and could enable banks in Ghana to generate customer loyalty and increase their performance. Presently, most banks deliver customer service through technology. However, studies on technology innovation that generally impact service quality (consistency), customer satisfaction and loyalty of banks are rarely studied.

This discussion suggests the following hypotheses:

H1a: There is significant relationship between technological innovation and service consistency in banking.

H1b: Technological innovation positively affects customer satisfaction in banking

H3a: Technological innovation is positively associated with customer loyalty in banking.

Service Consistency

In the service industry, the consistency of delivering the expected service attributes to customers is a reliable measure of total quality (Domingo, 2016). According to Iberahim et al (2016), consistency is an important factor that influences banking services. Banks with clear policies, rules, and supporting

mechanisms in specific business areas are able to deliver service consistently to forge relationship of trust with customers (Pulido et al., 2014). Offering the desirable service qualities that conform to the expectations of customers at all times regardless of time, location, and circumstance is service consistency (Asubonteng et al., 1996). In banking, addressing the changing needs of customers in predictable and consistent manner is appropriate since consistency in service delivery influences the choice that customers make for a particular brand (Iberahim et al, 2016). Firms need to maintain quality, build relationship, achieve reliability, establish effective communication links with customers, and improve entire customer journey in a quest to offer service consistency (Qureshi, 2014). Consistency (reliability) is an important evaluation factor of service (Shostack, 1987) and antecedent to satisfaction and loyalty (Iacobucci et al., 1995). However, research on customer service do not explicitly discuss it and deserves greater recognition (Iacobucci et al., 1995). We are of the view that quality, value, and delivery are contributors to service consistency.

Service Quality

Service is the major area today's firms compete, making it a core component of business and a strategic function (Kandampully, 2002). Hence, service offering must exhibit desirable qualities that conform to the expectations of consumers. Comparing product or service delivered with the actual perception of product or service received is the measure of service quality (Munusamy et al., 2010; Parasuraman et al., 1985). Quality is the buyer's perception of value or benefits in the product or service relative to their price they perceive (Zehir et al., 2015). For instance, system availability and fulfilment (Parasuraman et al., 2005; Marimon et al., 2009); efficiency, privacy/security and responsiveness (Parasuraman et al., 2005; Fuentes-Blasco et al., 2010); and fulfilment/reliability, customer service, personalization, usability, and informativeness (Wolfinbarger & Gilly, 2003) positively influence customer's perceived *quality* and *value.* Service quality directly affects satisfaction (Parasuraman et al., 1985; Zeithaml et al., 2006; Korda & Snoj, 2010), and according to Arun Kumar et al (2010), it positively impacts loyalty in the context of banking. Service quality as a major contributor to *service consistency* generates customer value, which is a significant antecedent of customer satisfaction and loyalty (Xu et al., 2015).

Customer Satisfaction

In banking industry, product and service quality are key elements of customer satisfaction and critical factors for retaining valued customers (Parasuraman et al., 1985). According to Schiffman & Kanuk (2004, p.14), customer satisfaction is "the individual's perception of the performance of the products or services in relation to his or her expectations." Customer satisfaction could be *transaction-specific* (post-choice evaluation judgement of a specific purchase occasion – Oliver, 1980) or *cumulative* (overall evaluation of total purchase and consumption experiences with a product or service over time – Fornell, 1992). Several studies including Ravichandran et al (2010), Kotler & Amstrong (2012), and Bowen and Chen (2015) have indicated customer satisfaction among others the most important antecedent of customer loyalty in the service industry. However, customer loyalty is not completely determined by customer satisfaction (Kumar et al., 2013). Considering customer satisfaction as an important outcome of service consistency, innovation, and a key antecedent of customer loyalty, it was appropriate to include it in the analysis. Customers who are satisfied with consistent service quality are induced beneficiaries and are likely to give positive recommendation (Bennett & Barkensjo, 2005).

The discussion above suggests the following hypotheses:

H2: Service consistency positively influences customer satisfaction in banking.

H3b: Service consistency positively influences customer loyalty in banking.

H3c: There is positive relationship between customer satisfaction and customer loyalty in banking.

Customer Loyalty

In the competitive banking industry, firms devise strategies to win and retain loyal customers in a quest to maintain competitive advantage (Grönroos, 2009). These strategies include measures to deliver value added services during exchange (Grönroos, 2011) as perceived and evaluated by consumers (Bolton et al.,

2014). Consistent delivery of expected service attributes to customers results in customer value that influences customer loyalty. Loyalty is conceptualised as psychological (attitudinal expression) and behavioural (process terms) in a relationship (Oliver, 1999). Oliver (1999) defines loyalty as "a deeply-held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby, causing repetitive same brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior." According to Kim et al (2006), psychological, preferential, and a sense of goodwill towards a particular product or service are the elements of loyalty. Several factors including price, product and service quality, value, and satisfaction contribute to customer loyalty (Noyan & Şimşek, 2014). Loyal customers are more likely to make credible recommendations of a brand to others (Yoon, Hostler, Guo, Guimaraes, 2013). Consumer research suggests that recommendation is a critical success factor that plays an important role in customer purchase decisions and consumption (Katz & Lazarsfeld, 2015; Zeithaml, et al., 1993). Customers are more likely to rely on recommendation to use especially, banking products/services and processes that are intangible and experiential technology (Murray, 1991). According to Rogers (2010) in the Diffusion of Innovation Theory, the assurance to adopt an innovation depends on reliable and credible information obtained through recommendation.

The ability of banks to understand the antecedents of customer loyalty is likely to help them enhance their performance. Despite the multi-dimensionality nature of consumer research, studies usually neglect the interrelationships and the ensuing effects among technological innovation, service consistency, and customer loyalty. We consider SERVQUAL an appropriate theoretical lens to guide mainly the examination of service consistency effects on customer satisfaction and loyalty.

The discussion above suggests the following hypothesis:

H4: New or improved product and process (technological innovation), service consistency, and innovative product and process satisfaction (customer satisfaction) impact customer loyalty.

The conceptual research model, Figure 1 depicts how the various hypotheses are related.
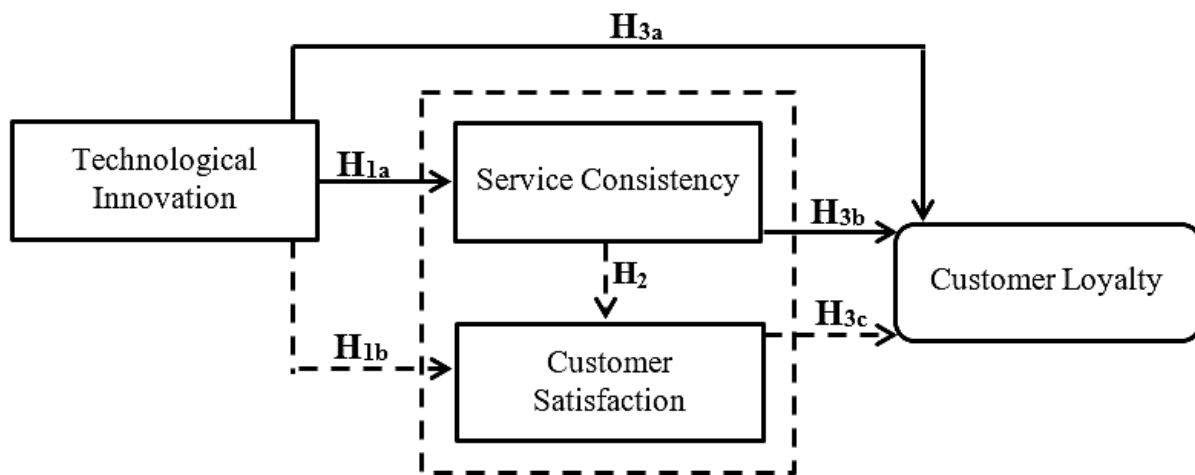

Figure 1: The Conceptual Research Model

Research and Methodology

Sample and Data Collection

The study adopted quantitative method. With the help of trained research assistants, closed and open-ended survey questions were administered to respondents (customers) to measure the relationships

between the variables identified in the literature. To cover extensive area and include diversity of the study, respondents who are customers of seven universal banks were randomly selected from three most densely populated regions in Ghana between March and May 2015. These seven banks were purposefully selected based on their information richness (Patton, 1990) to best understand the phenomenon under study. For a reasonable comparison and analysis, all seven banks were consistently rated among first quartile (*grouping based on the book values of total operating assets such as cash and liquid assets – investments, net loans and advances as at 31 December each year*) universal banks in Ghana between 2010 and 2014 (see PricewaterhouseCoopers, 2015). From the branch levels of the banks, 562 self-administered valid questionnaires were completed by customers aged 18 and over after rejecting some incomplete ones.

Measure of Constructs

Most technology based service quality studies are centred on a single channel (internet based) (Barrutia et al., 2009), and those relating to banks are mainly examined on specific technologies such as the internet banking, ATM banking and phone banking (Al-Hawari et al., 2005). IT-innovative products or services facilitate all modern banking electronic services. However, there is non-existence of a conceptual framework that evaluates the e-service quality in relation to the whole process of e-service delivery (Zemblytė, 2015). It is then appropriate to incorporate a wide-range of measurements from literature focusing on technology enabled banking services and how these dimensions affect customer satisfaction and loyalty. For *service consistency*, the study adopts measures of the conceptual framework of e-service quality of Zemblytė (2015) that encapsulates WebQUAL (Website quality scale) (Loiacono et al., 2002), E-S-QUAL (A core e-service quality scale) and E-RecS-QUAL (E-service quality recovery scale) (Parasuraman et al., 2005).

Table 1: Measurement of study

Construct	No of items	Source
TI	5	(OECD, 2005; Alegre et al., 2006; Heidt, 2008; Gunday et al., 2011)
TI → SC	6	(Parasuraman et al., 2005; OECD, 2005; Alegre et al., 2006; Heidt, 2008; Gunday et al., 2011)
TI → CS	6	(Levesque & McDougall, 1996; OECD, 2005; Alegre et al., 2006; Heidt, 2008; Gunday et al., 2011)
TI → CL	6	(Kim et al., 2004; OECD, 2005; Alegre et al., 2006; Heidt, 2008; Gunday et al., 2011)
SC → CS	11	(Zeithaml et al., 1996; Parasuraman et al., 2005; Al-Hawari & Ward, 2006; Stiakakis & Georgiadis, 2009; Barun et al., 2014; Zemblytė, 2015)
SC → CL	12	(Zeithaml et al., 1996; Yang et al., 2004; Parasuraman et al., 2005; Zemblytė, 2015)
CS → CL	10	(Levesque & McDougall, 1996; Ganesh et al., 2000; Aydin and Ozer, 2005; Wu and Li, 2011; ACSI)
CL	10	(Zeithaml et al., 1996; Johnson et al., 2001; Bansal & Taylor, 2002; Kim et al., 2004; Aydin & Ozer, 2005; Collier & Bienstock, 2006)

Technological Innovation (TI), Service Consistency (SC), Customer Satisfaction (CS), Customer Loyalty (CL)

Presently, most banks deliver customer service through technology-based channels making it appropriate to include items that measure customer service. The three antecedents of customer satisfaction (perceived quality, perceived value and customer expectations) is adopted from The American Customer Satisfaction Index (ACSI). However, measures of each antecedent were extracted from other sources of literature. Table 1 shows variables, their measurements and sources. The direction of the arrow indicates the effects of the variable.

Data Analysis and Findings

Sample Characteristics

The demographic characteristics summary of the respondents in Table 2 shows slightly higher number of male respondents than that of female. High proportion of respondents in the sample are in the 18-39 age group (86 per cent) that reflects the general Ghanaian age structure (CIA, 2016). Educational level of respondents is quite high.

Table 2: Characteristics of Respondents

Characteristics	Frequency & Percentage						
Gender	*N*	*%*	**Age**	*N*	*%*	**Education**	*N*	*%*
Male	360	64	18 – 29	276	49	University	401	71.4
Female	198	35	30 – 39	207	37	Polytechnic	46	8.2
MV	4	.7	40 – 49	55	10	College	53	9.4
			50+	18	3	Other	36	6.4
			MV	6	1	Missing value	26	4.6

Analysis and Findings

Data analysis proceeds in two steps using SPSS version 22 for Windows. To guarantee acceptable results of the study, the reliability and validity of constructs' measurements were established, and correlations among the variables were predicted. The analysis then proceeded to testing the hypotheses through regression analysis.

Measuring Reliability and Validity

We first examine the reliability and validity measures for the model constructs. The Cronbach's alphas for each of first order level and all other variables exceed the accepted reliability threshold of .70 (Appendix 1) (Hair et al., 2006) making that data collected reliable. For face validity, measurement items used in the study were adopted from the existing literature.

Table 3: Reliability Test

Variable	Number of Items	Cronbach's Alpha
Technological Innovation	TI=3; TI → SC, CS, CL = 5	.75
Service Consistency	SC → CS =10, SC → CL =12	.71
Products/Process Satisfaction	CS → CL =10	.76
Customer Loyalty	9	.74

New/Improved Product/Process Functionalities (NIPPF) or Technological Innovation (TI), Service Consistency (SC), Customer Satisfaction (CS), Customer Loyalty (CL) or Recommend Bank

Bivariate Correlations procedure was used to compute Pearson's correlation coefficient for the purposes of checking multicolinearity between the variables, and the nature, direction and significance of the bivariate relationship of the variables of this study. Table 4 shows the Pearson's correlation coefficient of the

variables. The results show that there is a positive correlation between the variables (minimum r=.260, maximum r=.667) and a very high statistical significance of *p < 0.001*.

Table 4: Pearson Correlations

		FI	SC	CL	IPPS	IPPQ	NIPPF
FI	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	523					
SC	Pearson Correlation	.505**	1				
	Sig. (2-tailed)	.000					
	N	491	519				
CL	Pearson Correlation	.516**	.552**	1			
	Sig. (2-tailed)	.000	.000				
	N	486	480	521			
IPPS	Pearson Correlation	.364**	.260**	.510**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	479	475	480	512		
IPPQ	Pearson Correlation	.509**	.485**	.667**	.424**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	499	497	501	494	533	
NIPPF	Pearson Correlation	.442**	.359**	.492**	.445**	.416**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	504	502	508	498	524	540

**. Correlation is significant at the 0.01 level (2-tailed).

Firm Innovativeness (FI), Service Consistency (SC), Customer Loyalty (CL), Innovative Product/Process Satisfaction (IPPS), Innovative Product/Process Quality (PPIQ), New/Improved Product/Process Functionalities (NIPPF)

Regression Analysis

In order to explain the relationships presented in Figure 1, multiple linear regression was used to study the effect of the independent variables. The measurement items, descriptive and statistical results of individual variables are shown in Table A of Appendix 1. Preliminary analysis conducted with Pearson's correlation showed no multicolinearity between any two variables and indicates a strong positive association between variables (Table 4). However, a variable could be co-linear with a combination of other variables making collinearity diagnostic appropriate. Correlation analysis exhibited a complex web of associations that indicates existence of mediating effects. In order to reveal the best fit structure of complex relations among our variables, we prefer to conduct multiple regression analyses to check if the impact of an existing significant variable disappears when combine with other significant variable(s). Examined tolerance measures that give the strength of the linear relationships among the independent variables indicated no multicollinearity with all scores above acceptable value of 0.6 (Chan, 2004) for model 1 (see Table 7). In model 1, New/Improved Product/Process Functionalities (NIPPF) or Technological Innovation (TI), Service Consistency (SC) and Innovative Product/Process Satisfaction (IPPS) or Customer Satisfaction (CS) and Customer Loyalty (CL) were included as independent and dependent variables respectively.

Relationship Analysis

The multiple linear regression analysis found that technological innovation, service consistency and customer satisfaction have relevant explanatory power. Together, the estimated regression model explains 53.4 % of the variability in customer loyalty with an adjusted R^2 of 53.1% (see Table 5). The Durbin-Watson estimate of 2.001 clearly shows the data points were independent and we can assume that there is no first order linear autocorrelation (Chan, 2004). The regression *model 1* is highly significant with *p < 0.001* and F =165.602 significantly improves our ability to predict the outcome variable (see Table 6).

Table 5: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	F Change	Sig. Change	FDurbin-Watson
1	.731[a]	.534	.531	.136	165.602	.000	2.001

a. Predictors: (Constant), Innovative Product/Process Satisfaction, Service Consistency, New/Improved Product/Process Functionalities

b. Dependent Variable: Customer Loyalty

Table 6: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.221	3	3.074	165.602	.000[b]
	Residual	8.037	433	.019		
	Total	17.259	436			

a. Dependent Variable: Customer Loyalty

b. Predictors: (Constant), Innovative Product/Process Satisfaction, Service Consistency, New/Improved Product/Process Functionalities

The standard error of the estimate on Table 5 is .136, which indicates that, we cannot only show a linear relationship between the variables. Thus, from Table 7, a single improvement in product/process functionality increases customer loyalty by 0.208. All predictors are highly significant contributors to the model ($p < 0.001$) and have positive *b* values indicating positive relationships with customer loyalty. Service consistency has a marginal higher impact (β = .373, Table 7) on customer loyalty than NIPPF and IPPS. Hypothesis H4 is confirmed.

Table 7: Model 1 Coefficients

Variable	Unstandardized β	Std. Error	Standardized β	*t*-value	Sig.	Tolerance	VIF
(Constant)	.420	.030		14.104	.000		
SC	.091	.009	.373	10.636	.000	.877	1.141
NIPPF	.208	.026	.298	8.083	.000	.789	1.268
IPPS	.193	.023	.310	8.433	.000	.798	1.253

a. Dependent Variable: Customer Loyalty

New/Improved Product/Process Functionalities (NIPPF) or Technological Innovation (TI), Service Consistency (SC) and Innovative Product/Process Satisfaction (IPPS) or Customer Satisfaction (CS) and Customer Loyalty (CL)

Summaries of multiple linear regression models, overall fit statistics that show the effect of individual variables and the results of hypotheses (H1a to H3c) tested are shown in Table 8. The effects of technological innovation, service consistency, and customer satisfaction on customer loyalty are shown at

Table 7. Statistical results in Tables 5 – 8 and Appendix 1 indicate positive significant effects; hence, hypotheses H1a to H3c are confirmed. However, it is important to understand the relationship between

Table 9: Descriptive statistics between level of service consistency and major variables

individual variables since the impact of an existing significant variable may disappear when combine with other significant variable(s). From appendix 1, Product/Process Quality is contributing significantly than all other items to each relationship (H1a to H3c) with $β$ ranging from .345 to .742 and $p < 0.001.$ On technological innovation, product innovation ($β$ = .261, $p < 0.001$) and Customer Loyalty, Product/Process

Hypotheses and Paths		ANOVA		Model Summary					Hypotheses and Paths
Hypothesis	Path	F	Sig.	R	R²	S.EE	SFC	Durbin-Watson	**Results**
H1a	TI → SC	73.505	.000	.672	.452	.605	.000	2.118	Supported
H1b	TI → CS	31.120	.000	.522	.273	.498	.000	1.957	Supported
H2	SC → CS	23.542	.000	.582	.339	.456	.000	1.998	Supported
H3a	TI → CL	94.272	.000	.717	.513	.175	.000	2.064	Supported
H3b	SC → CL	63.258	.000	.777	.603	.158	.000	2.021	Supported
H3c	CS → CL	135.874	.000	.860	.739	.115	.000	2.014	Supported

New/Improved Product/Process Functionalities (NIPPF) or Technological Innovation (TI), Service Consistency (SC), Innovative Product/Process Satisfaction (IPPS) or Customer Satisfaction (CS), Customer Loyalty (CL)
    Std. Error of the Estimate (S.EE), Sig. F Change (SFC), Unstandardized (Ustd), Standardized (Std)

Quality ($β$ = .561, $p < 0.001$) are contributing significantly.

Table 8: Models summaries, overall fit statistics and results of hypotheses tests

Discussion and Implications

This study makes important contributions to the field of banking services and offer useful and practical guidelines to the managers of banking firms. Dimensions of service consistency and technological innovation are identified since banks adopt technology to deliver customer service. Key indicators of customers' confidence in banking technology are customer satisfaction and loyalty. We then contribute to the literature by examining the differential impact of these dimensions on customer satisfaction and loyalty, and how each dimension influences the other.

Key Findings

Our analysis found support for seven hypotheses relating to technological innovation, service consistency, customer satisfaction and customer loyalty. As hypothesized (H4), new or improved product and process functionalities (technological innovation), service consistency, and innovative product and process satisfaction (customer satisfaction) individually contributes significantly to the dependent variable, customer loyalty. There is significant correlation among these predictors and the dependent variable (see Table 4). Each predictor contributes positively to customer loyalty with *service consistency* having a marginal higher impact on customer loyalty. However, new/improvement in product/process functionality increases customer loyalty than the other predictors. Our findings suggest that customers who agree or strongly agree of receiving consistent quality innovative service are more likely to become loyal customers and recommend their banks to others; more satisfied with innovative product and process; rate innovative product and process as high quality; and indicate their banks have introduced new or improved product and process functionalities (see Table 9). Considering individual items, our findings indicate excellent customer service, product/process quality, and number of years as a customer (+3yrs) positively influence customer loyalty. Though closeness of bank branch significantly contributes to customer loyalty, its influence is negative. Thus, relocation of customers or bank branch could lead to switching (see appendix 1).

		NIPPF		IPPQ					IPPS					YaC			RB	
		Y	N	HQ	Q	N T	LQ	Le Q	HS	SD	N T	D D	HD D	<1	1-3	+3	Y	N
Level of Service Consistency	SA	128	3	71	54	0	2	2	64	54	0	5	4	15	31	86	127	1
	A	244	21	35	210	9	8	3	57	170	11	5	5	27	72	172	266	2
	NU	59	21	8	52	13	4	1	16	35	8	6	0	15	26	40	56	14
	DA	11	9	0	10	9	0	0	4	7	5	0	0	0	4	16	7	10
	SDA	3	3	0	0	5	0	0	0	0	2	0	0	0	2	3	0	5
Total		445	57	114	326	36	14	6	141	266	26	16	9	57	135	317	456	32

New/Improved Product/Process Functionalities (NIPPF), Service Consistency (SC), Innovative Product/Process Satisfaction (IPPS) or Customer Satisfaction (CS), Recommend Bank (RC) or Customer Loyalty (CL), Innovative Product/Process Quality (IPPQ), Number of years as bank customer (YaC); Number of count: Yes (Y), No (N), High quality (HQ), Quality (Q), Neutral (NT), Low quality (LQ), Least quality (LeQ), Highly satisfied (HS), Satisfied (SD), Neutral (NT), Dissatisfied (DD), Highly dissatisfied (HDD). Strongly Agree (SA), Agree (A), Neutral NU), Disagree (DA), Strongly disagree (SDA)

Our findings on technological innovation show that, customers are more interested in the introduction/improvement in product functionalities than process. Our results confirmed significant relationships between each of the following: Technological Innovation → Service Consistency (H1a), Technological Innovation → Customer Satisfaction (H1b), Technological Innovation → Customer Loyalty (H3a), Service Consistency → Customer Satisfaction (H2), Service Consistency → Customer Loyalty (H3b), and Customer Satisfaction → Customer Loyalty (H3c). *Product/process quality* contributes significantly than all other items to each of the above relationships. Quality product enables personalization, increases service efficiency, leads to timeliness in transaction processing, cuts down transaction cost, and makes customers feel safe and secured during transaction processing.

Embarking on product and process innovations does not necessarily means there will be success. Firm innovativeness and product/process quality contributed significantly to Technological Innovation → Service Consistency relationship since successful service consistency depends on them. Similarly, firm innovativeness and product/process quality contributed significantly to Technological Innovation → Customer Loyalty. Thus, customers are satisfied with quality product and process. However, customers were found satisfied with product and process innovations, firm innovativeness and product/process quality in the Technological Innovation → Customer Satisfaction relationship. On Service Consistency → Customer Satisfaction relationship, it is clear that product/process quality should enable personalization; else, customers' satisfaction will dip. Service Consistency → Customer Loyalty: convenient services and the procedure to access the various products could impact negatively on customers' loyalty. Customer loyalty improves where the bank honours its commitments to customers, provides accurate and consistent services to customers that are facilitated through new/improved product/process functionalities and quality product/process, and customers feel a sense of secure during transaction process. A wide variety of products and services do not improve customer loyalty. In relation to Customer Satisfaction → Customer Loyalty; product/process quality, offering attractive products and service, procedure to access the various products and ease of use, innovative product/process satisfaction, and service consistency increase satisfaction of customers that result in customer loyalty and a probability of recommending bank. Several independent variables were consistently found to be significantly associated with the dependent variables. Timeliness in transaction processing was found insignificant in all the relationships.

Practitioner Implications

The major contribution of this study is identifying antecedents of service consistency, customer satisfaction and loyalty. Our findings could be turned into insights to empower managers of banking services to understand the needs of their customers and serve them better. The service consistency dimensions identified in this study are related to technological innovation of banking firms. Consistency (reliability) is an important evaluation factor of service (Shostack, 1987) and antecedent to satisfaction and loyalty (Iacobucci et al., 1995). Managers would be able to focus on and delve more deeply into innovation strategies to support service consistency. Managers would be in a better position to measure the

perceptions of service consistency, thereby providing them with more reliable and actionable insights on the allocation of resources to improve customer satisfaction and increase customer loyalty. Dimensions identified in this study are generic in nature; hence, managers can adopt them to assess the customers' perceptions whenever an innovative product/process is introduced in the banking services sector. Our findings indicate positive impact of service consistency dimensions on customer satisfaction and customer loyalty. With a fair understanding of the impact of these dimensions on customer satisfaction and loyalty, management can formulate proper strategies to encourage the confidence of customers.

Conclusions

Using data from 562 customers of banks in Ghana, we explored the antecedents of customer satisfaction and loyalty. The study assessed the interrelationships and the ensuing effects among technological innovation, service consistency, and customer loyalty that are not explicitly discussed in consumer research. Our findings suggest strong link among them. The contribution of innovation to customer satisfaction, customer loyalty and service consistency that are rarely studied in customer-focused strategic orientation research is covered. Our findings show that innovativeness, service consistency, quality innovative product/process, innovative product/process satisfaction, and new/improved product/process functionalities positively contribute to customer loyalty. The findings are not absolute fact, rather the broader perceptions of customers' feedback with respect to consistent quality innovative service offered by their banks. Although, perceptions are subjective and neither balanced nor fair, the survey sample size guaranteed the result that reflects the opinion of respondents.

Studying the interrelationships and influence among innovation, service consistency, customer satisfaction and loyalty in banking firms is conceptually interesting. The findings of this study can serve as a guide towards further research in banking services by exploring other innovation options and service consistency dimensions. The study focused on banking industry. This makes the identified service consistency and technological innovation dimensions not generalizable. Conducting the same study in other technology based service industries could make the findings generalizable across service industries. To have extensive understanding of the study area, other methods for collecting data, such as interviews and open-ended questions could be used in future research. Moreover, future researchers should use a more representative sampling strategy to generalize the findings of this study. It is recommended that more diversified and exhaustive variables that can address technological innovation, service consistency, and customer satisfaction in determining customer loyalty in banking firms should be considered in the future study.

References

Abdullah, F., Andrew, J. V., & Ho, V. B. (2010). Identifying and validating dimensions of service quality for the banking industry in Malaysia. *Journal of Global Business and Economics*, 1(1), 79-98.

ACSI. (2017). Antecedents of customer satisfaction. *Available online* 20 January 2017: www.theacsi.org

Al-Hawari, M., & Ward, T. (2006). The Effect of Automated Service Quality on Australian Banks' Financial Performance and the Mediating Role of Customer Satisfaction. *Marketing Intelligence & Planning*, 24(2), 127-147.

Alegre, J., Lapiedra, R. & Chiva, R. (2006). A measurement scale for product innovation performance. *European Journal of Innovation Management*, 9(4), 333-346.

Anderson N, Potočnik, K, & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management,* 40, 1297-1333.

Arun Kumar, S., Tamilmani, B., Mahalingam, S. & Vanjikovan, M. (2010). Influence of service quality on attitudinal loyalty in private retail banking: an empirical study. *The IUP Journal of Management Research*, 9(4), 21-38.

Asante, S., Agyapong, D. & Adam, A.M. (2011). Bank competition, stock market and economic growth in Ghana. *International Journal of Business Administration*, 2(4), 33-41.

Asubonteng, P., McCleaty, K. & Swan, J. (1996). SERVQUAL revisited: a critical review of service quality. *Journal of Service Marketing*, 10(6), 62-81.

Aydin, S. & Ozer, G. (2005). National customer satisfaction indices: an implementation in the Turkish mobile telephone market. *Marketing Intelligence & Planning*, 23(5), 486-504.

Baba, Y. (2012). Adopting a specific innovation type versus composition of different innovation types: Case study of a Ghanaian bank. *International Journal of Bank Marketing*, 30(3): 218–240.

Bansal, H. S., & Taylor, S. F. (2002). Investigating interactive effects in the theory of planned behavior in a service-provider switching context. *Psychology & Marketing*, 19(5), 407–425.

Barrutia, J.M., Charterina, J & Gilsanz, A. (2009). E-service quality: an internal, multichannel and pure service perspective. *The Service Industries Journal*, 29(12), 1707–1721.

Barun, K. J., Sureka, S., & Shitika (2014). Customer's Satisfaction for ATM Services in Bihar, India. *International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS)*, 1(4), 42-49.

Bassellier, G., Benbasat, I. (2004). Business competence of information technology professionals: conceptual development and influence on IT-business partnerships. *MIS Quarterly, 28*(4), 394–673.

Bennett. R & Barkensio A. (2005) Relationship quality, relationship marketing, and client perceptions of the levels of service quality of charitable organisations. *International Journal of Service Industry Management*, 16(1) 81-106

Bergfors, M. E. & Larsson, A. (2009). Product and process innovation in process industry: a new perspective on development. *Journal of Strategy and Management*, 2(3), 261-276.

BoG. 2016. Bank of Ghana. Register of Licensed Institutions. Available Online: https://www.bog.gov.gh/index.php?option=com_content&view=article&id=110&Itemid=123. *Date accessed*: 15th November 2016.

Bolton, R.N., Gustafsson, A., McColl-Kennedy, J., Sirianni, N.J. & Tse, D.K. (2014). Small details that make big differences: a radical approach to consumption experience as a firm's differentiating strategy. *J. Serv. Manag*. 25(2), 253–274.

Bowen, J.T. & Chen McCain, S.L. (2015). Transitioning loyalty programs: a commentary on "the relationship between customer loyalty and customer satisfaction". *Int. J. Contemp. Hosp. Manag*. 27(3), 415–430.

CIA. (2016). Age Structure. The World Factbook, Central Intelligence Agency. *Accessed* 18 January 2017. https://www.cia.gov/library/publications/the-world-factbook/geos/gh.html

Chan, Y. H. (2004). Biostatistics 201: Linear Regression Analysis. Singapore Medical Journal Vol 45(2): 55-61

Chen, J. S & Tsou, H. T. (2007). Information Technology Adoption for Service Innovation Practices and Competitive Advantage: The Case of Financial Firms. *Information Research* 12(3) paper 314.

Chen, K. (2005). Technology-based service and customer satisfaction in developing countries. *International Journal of Management*, 22(2), 307–318.

Collier, J.E. and Bienstock, C.C. (2006). Measuring service quality in e-retailing. *Journal of Service Research*, 8(3), 260-275.

Damanpour, F. (2010). An Integration of Research Findings of Effects of Firm Size and Market Competition on Product and Process Innovations. *British Journal of Management*, 21, 996-1010

Davenport, T.H. (1993). *Process Innovation Reengineering Work through Information Technology*. Harvard Business School Press, Boston, Massachusetts.

Domingo, R. T. Consistency in Service Quality. Business Management Articles. *Available* online 10th January 2016: http://www.rtdonline.com/BMA/CSM/9.html

Fatma, N. & Gü lhayat, G. Ş. (2014). The antecedents of customer loyalty. *Procedia - Social and Behavioral Sciences,* 109, 1220 – 1224

Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56, 6-21.

Foroudi, P., Melewar, T. C., & Gupta, S. (2014). Linking corporate logo, corporate image, and reputation: An examination of consumer perceptions in the financial setting. *Journal of Business Research*, 67(11), 2269–2281.

Fuentes-Blasco, M., Saura, I., Berenguer-Contrı, G., & Moliner-Vela´zquez, B. (2010). Measuring the antecedents of e-loyalty and the effect of switching costs on website. *The Service Industries Journal*, 30(11), 1837-1852

Ganesh, J., Arnold, M.J. & Reynolds, K.E. (2000). Understanding the customer base of service providers: an examination of the differences between switchers and stayers. *Journal of Marketing*, 64(3), 65-87.

Grönroos, C. (2009). Marketing as promise management: regaining customer management. *J. Bus. Ind. Mark.*, 24(5/6), 351–359.

Grönroos, C. (2011). A service perspective on business relationships: the value creation, interaction and marketing interface. *Ind. Mark. Manag.* 40(2), 240–247.

Gunday, G., Ulusoy, G., Kilic, K. & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal Production Economics* 13(3), 662–676.

Gupta, S., & Malhotra, N. (2013). Marketing innovation: A resource-based view of international and local firms. Marketing Intelligence & Planning, 31(2), 111–126.

Hair, J.F. Jr, Black, C.W., Babin, J.B., Anderson, R.E. & Tatham, L.R. (2006). *Multivariate Data Analysis*. Sixth ed., Pearson, Upper Saddle River, NJ.

Heidt, T.V.D. (2008). Developing and Testing Model of Cooperative Interorganizational Relationships (IORS) in Product Innovation in an Australian Manufacturing Context: A Multi-stakeholder Perspective, Sourthern Cross University, Lismore.

Iacobucci, D., Ostrom, A. & Grayson, K. (1995). Distinguishing Service Quality and Customer Satisfaction: The Voice of the Consumer. *Journal of Consumer Psychology*, 4(3), 277-303

Iberahim, H., Mohd Taufik, N.K., Mohd Adzmir, A.S. & Saharuddin, H. (2016). Customer Satisfaction on Reliability and Responsiveness of Self Service Technology for Retail Banking Services. *Procedia Economics and Finance,* 37, 13–20.

Johnson, M.D., Gustafsson, A., Andreassen, T.W., Lervik, L. & Cha, J. (2001). The evolution and future of national customer satisfaction index models. *J. of Economic Psychology*, 22(2), 217-45.

Kandampully, J. (2002). Innovation as the core competency of a service organisation: the role of technology, knowledge, and networks. *European Journal of Innovation Manage.,* 5(1), 18-26.

Katz, E. & Lazarsfeld, P. (2015). *Personal Influence*. The Free Press, New York.

Kim, M., Kim, J.-H. & Lennon, S.J. (2006). Online service attributes available on apparel retail web sites: an E-S-QUAL approach. *Managing Service Quality*, 16(1), 51-77.

Kim, M.K., Park, M.C. & Jeong, D.H. (2004). The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services. *Telecommunications Policy*, 28(2), 145-159.

Korda, A.P. & Snoj, B. (2010). Development, validity and reliability of perceived service quality in retail banking and its relationship with perceived value and customer satisfaction. *Managing Global Transitions*, 8(2), 187-205.

Kotler, P. & Amstrong, G. (2012). *Principle of marketing*. 15th edition. Global edition, Pearson.

Kumar, V., Pozza, I. D., & Ganesh, J. (2013). Revisiting the satisfaction–loyalty relationship: Empirical generalizations and directions for future research. *Journal of Retailing*, 89, 246–262.

Levesque, T. & McDougall, G.H.G. (1996). Determinants of customer satisfaction in retail banking. *International Journal of Bank Marketing*, 14(7), 12-20.

Lieberman, M. & Montgomery, D. (1988). First-mover advantages. *Strategic Management Journal*, 9, 41–58.

Loiacono, E.T., Watson, R.T. & Goodhue, D.L. (2002). WebQUAL: a measure of web site quality. Proceedings of the AMA Winter Educators' Conference, American Marketing Association, Chicago, IL, 432-438

Marimon, F., Vidgen, R., Barnes, S., & Cristóbal, E. (2009). Purchasing behavior in an online Supermarket: The applicability of E-S-QUAL. *International Journal of Market Research*, 52(1), 111-129.

Munusamy, J., Chelliah, S. & Mun, H. (2010). Service Quality Delivery and Its Impact on Customer Satisfaction in the Banking Sector in Malaysia. *International Journal of Innovation, Management and Technology*, 1(4), 398-404.

Murray, K.B. (1991). A test of services marketing theory: consumer information acquisition activities. *Journal of Marketing,* 55(1), 10–25.

Nemati, A., Khan, K. & Iftikhar, M. (2010). Impact of innovation on customer satisfaction and brand loyalty: a study of mobile phones users in Pakistan. *European Journal of Social Sciences*, 16(2), 299-306.

OECD (2005). Oslo Manual: Proposed Guidelines for Collecting and Interpreting Technological Innovation Data. 3rd ed. Paris.

Oliver, R.L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17(4), 460-9.

Oliver, R.L. (1999). Whence consumer loyalty? *J. Mark.* 63, 33–44.

Pan, Y. & Zinkhan, G.M. (2006). Determinants of retail patronage: a meta-analytical perspective. *Journal of Retailing,* 82(3), 229-243.

Parasuraman, A. (2010). Service productivity, quality and innovation: Implications for service-design practice and research. *International Journal of Quality and Service Sciences,* 2, 277–286.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4), 41-50.

Parasuraman, A., Zeithaml, V.A. & Malhotra, A. (2005). E-S-QUAL: a multiple-item scale for assessing electronic service quality. *Journal of Service Research*, 7(3), 213-233.

Patton, M. Q. 1990. Qualitative evaluation and research methods. 2nd Ed. Newbury Park. CA: Sage.

PricewaterhouseCoopers & Association of Bankers. (2015). Banking Survey Ghana: The Future of Banking in Ghana. Available Online: http://www.pwc.com/gh/en/assets/pdf/2015-banking-survey.pdf. *Date accessed*: 05 February 2015.

Pulido, A, Stone, D. & Strevel, J. (2014). The three Cs of customer satisfaction: Consistency, consistency, consistency. *Available* online 8th January 2016: http://www.mckinsey.com/industries/retail/our-insights/the-three-cs-of-customer-satisfaction-consistency-consistency-consistency

Qureshi, S. Customer Service. 5 Reasons Why Service Consistency Matters to Customers. *Available* online 10th January 2016: http://www.customerservice.ae/5-reasons-why-service-consistency-matters-to-customers

Ravichandran, K., Prabhakaran, S. & Kumar, A. S. (2010). Application of Servqual Model on Measuring Service Quality: A Bayesian Approach. *Enterprise Risk Management,* 1(1), 145-169.

Rogers, E.M. 2010. Diffusion of Innovations. Fourth Edition. Simon and Schuster.

Rosenbusch, N., Brinckmann, J. & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 26, 441–457.

Schiffman, L.G. & Kanuk, L.L. (2004). *Consumer Behaviour*. 8th edition. Prentice Hall, Upper Saddle River, NJ

Shostack, G.L. (1987). Service positioning through structural change. *Journal of Marketing,* 51, 34-43.

Stiakakis, E., & Georgiadis, C. K. (2009). E-service Quality: Comparing the Perceptions of Providers and Customers. *Managing Service Quality: An International Journal*, 19(4), 410-430.

Taylor, S.A., Hunter, G.H. & Longfellow, T.A. (2006). Testing an expanded attitude model of goal-directed behaviour in a loyalty context. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 19(1), 18-39.

Tseng, M.-L., Lin, Y.H., Lim, M.K., & Teehankee, B.L. (2015). Using a hybrid method to evaluate service innovation in the hotel industry. *Appl. Soft Comput*. 28, 411–421.

Walker, R.M. (2008). An empirical evaluation of innovation types and organizational and environmental characteristics: towards a configuration framework. *Journal of Public Administration Research and Theory, 18*(4).

WB. (2014). The Global Findex Database 2014. Measuring Financial Inclusion around the World. World Bank Policy Research Working Paper 7255.

Wolfinbarger, M., & Gilly, M. (2003). E-TailQ: dimensionalizing, measuring, and predicting retail quality. *Journal of Retailing*, 79, 183-193.

Wu, I-L. & Chiu, M-L. (2015). Organizational applications of IT innovation and firm's competitive performance: A resource-based view and the innovation diffusion approach. *Journal of Engineering and Technology Management*, 35(25), 25–44

Wu, Shwu-Ing, & Li, Pei-Chi. (2011). The relationships between CRM, RQ and CLV based on different hotel preferences. *International Journal of Hospitality Management*, 30, 262-271.

Xu, C., Peak, D., & Prybutok, V. (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations. *Decision Support Systems*, 79, 171–183

Yang, Z., Joon, M. & Peterson, R.T. (2004). Measuring customer perceived online service quality: scale development and managerial implications. *International Journal of Operations & Production Management*, 24(11), 1149-74.

Yoon, V.Y., Hostler, R.E., Guo, Z., & Guimaraes, T. (2013). Assessing the moderating effect of consumer product knowledge and online shopping experience on using recommendation agents for customer loyalty. *Decision Support Systems*, 55(4), 883–893.

Zehir, C., Köle, M., & Yildiz, H. (2015). The mediating role of innovation capability on market orientation and export performance: an implementation on SMEs in Turkey. 11th international strategic management conference. *Procedia – Social and Behavioral Science*, 207, 700-708

Zeithaml, V.A., Berry, L.L. & Parasuraman, A. (1993). The nature and determinants of customer expectations of service. *Journal of the Academy of Marketing Science*, 21(1), 1–12.

Zeithaml, V.A., Berry, L.L. & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31-46.

Zeithaml V. A., Bitner M. J. & Gremler D. D. (2006). *Services marketing*. 4th edition, McGraw-Hill.

Zemblytė, J. (2015). The Instrument for Evaluating E-Service Quality. *Procedia - Social and Behavioral Sciences,* 213, 801-806

Appendix 1

Table A: The Coefficients of Regression Analysis and Pearson's Correlation of variables

Items	Ustd β	Std β	*t*-value	Sig.	α
Technological Innovation					
DI: *New/improved product/process functionalities*					.718
Products Innovation	.131	.261	5.237	.000	.710
Processes Innovation	.092	.189	3.797	.000	.711
Technological Innovation → Service Consistency (H1a)					
DI: *Consistent services with latest banking innovations*					.703
Firm Innovativeness	.446	.174	3.955	.000	.713
Product/Process Quality	.537	.345	7.815	.000	.708
Products Innovation	.350	.350	.061	.259	–
Processes Innovation	.193	.193	.057	.147	–
Technological Innovation → Customer Satisfaction (H1b)					
DI: *Innovative Product/Process Satisfaction*					.720
Firm Innovativeness	.265	.132	2.565	.011	–
Product/Process Quality	.416	.363	6.963	.000	–
Products Innovation	.109	.107	2.077	.039	–
Processes Innovation	.105	.111	2.220	.027	–
Technological Innovation → Customer Loyalty (H3a)					

DI: *Recommend Bank*   .716

Firm Innovativeness	.132	.168	3.740	.000	–
Product/Process Quality	.582	.604	13.076	.000	–
Products Innovation	-.013	-.030	-.719	.472	–
Processes Innovation	.022	.056	1.388	.166	–

Service Consistency → Customer Satisfaction (H2)

DI: *Innovative Product/Process Satisfaction*   –

Safe and secured transaction processing	-.027	-.024	-.536	.593	.712
Product/Process Quality	.446	.418	8.819	.000	–
Timeliness in transaction processing	-.005	-.004	-.107	.915	.729
Enable personalization	-.109	-.090	-1.961	.050	.711
Products suit my needs and increases service efficiency	.099	.085	1.973	.049	.714
Service available round the clock any anywhere	.133	.119	2.726	.007	.722
Product/Process simple to understand and easy to use	.167	.149	3.407	.001	.716
Cut down transaction cost	.106	.093	2.058	.040	.715
Bank offers consistent service	.067	.093	1.998	.046	–

Service Consistency → Customer Loyalty (H3b)

DI: *Recommend Bank*   –

Services offered by the bank are convenient to me as a customer	-.044	-.088	-2.889	.004	.721
The bank honours its commitments to customers	.035	.066	2.023	.044	.724
New/improved product/process functionalities	.090	.118	3.568	.000	–
The bank provides accurate service to customers	.034	.068	2.082	.038	.725
Bank equipment is sufficient and visible for customer's usage	-.009	-.015	-.498	.618	.721
The bank has a wide variety of products and services	.005	.009	.288	.774	.725
Timeliness in transaction processing	-.021	-.041	-1.339	.181	–
The procedure to access the various products is very simple	-.053	-.076	-2.317	.021	.722
Bank offers consistent service	.057	.183	5.334	.000	–
Customers feel a sense of secure during the transaction process	.034	.066	2.012	.045	.731
Product/Process Quality	.556	.588	16.438	.000	–

Customer Satisfaction → Customer Loyalty (H3c)

DI: *Recommend Bank* –

The bank offers attractive products and service to customers	.027	.056	2.036	.042	.725
Timeliness in transaction processing	-.010	-.023	-.916	.360	–
Product/Process Quality	.666	.742	24.005	.000	–
Bank equipment is sufficient and visible for customer's usage	.003	.005	.195	.846	–
The bank has a wide variety of products and services	.015	.028	1.045	.297	–
Bank's products are easy to understand	.032	.070	2.513	.012	.721
Innovative Product/Process Satisfaction	.042	.059	2.084	.038	–
The procedure to access the various products is very simple	-.068	-.108	-3.844	.000	–
Bank offers consistent service	.035	.122	4.286	.000	–
Customer Loyalty					
Years as a customer (<1yr)	.085	.098	1.708	.088	
Years as a customer (1-3yrs)	.058	.100	1.319	.188	
Years as a customer (+3yrs)	.085	.165	2.030	.043	
Financial Stability	-.038	-.059	-1.659	.098	.728
Image and reputation of bank	.024	.039	1.100	.272	.732
Closeness of bank branch	-.075	-.128	-2.472	.014	.723
Excellent Customer Service	.127	.214	4.132	.000	.719
Product/Process Quality	.551	.561	13.064	.000	–
Bank offers consistent service	.058	.184	4.582	.000	–
Innovative Product/Process Satisfaction	.062	.077	1.966	.050	–

Unstandardized (Ustd), Standardized (Std), Dependent innovation (DI)