E-Banking Customer Satisfaction and Loyalty: Evidence from Serial Mediation through Modified E-S-QUAL Model and Second-Order PLS-SEM

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This research aims to measure the service quality of e-banking through e-customer satisfaction & e-customer loyalty in the Islamic e-banking sector of Pakistan. For this purpose, we modified the multiple-item scale (E-S-QUAL) model with two new dimensions: availability of online system and personal needs of customers. Additionally, we added two mediators, for instance, religiosity and trust in the Islamic e-banking perspective. We have collected 674 responses from the consumers of the Islamic banking sector of Pakistan through a structured questionnaire. The data were analysed through second-order PLS-SEM (PLS-structural equation modeling) to examine direct and serial mediation. The direct relationship results showed a positive and compelling effect of modified E-S-QUAL dimensions on e-customer satisfaction. Additionally, the e-customer satisfaction has an affirmative and significant association with e-customer loyalty. Moreover, the serial mediation relationship results exhibited that the e-customer satisfaction, trust, and religiosity mediated the modified dimensions of the E-S-QUAL model and e-customer loyalty.

Keywords: *Modified E-S-QUAL Mode; E-Customer Loyalty; E-Customer Satisfaction; Serial Mediation; E-Islamic Banking; PLS-SEM (Partial Least Square – Structural Equation Modeling); Smart-PLS (Partial Least Square) Software.*

Introduction

E-Islamic banking follows Islam's basic *Shariah* principles and laws. According to Islam, Pakistani and Malaysian Islamic banks strictly observe the *Shariah laws* (Singh, 2019; Ahmed *et al*., 2020; Dusuki & Abdullah, 2007). However, e-Islamic banking of Iran, UAE, Bahrain, Qatar, and Saudi Arabia are also functioning on the fundamentals of Islamic *Shariah laws*. According to Zouari and Abdelhedi (2021), Ali and Raza (2017), Amin *et al.* (2014), and Raza *et al.* (2020), customers are attracted to e-Islamic banking due to e-financial benefits and religious faith. Additionally, the customers relate to e-Islamic banking due to compliance with *Shariah laws,* social influence, customer's needs, and operational cost (Sleimi *et al.*, 2020; Ahmed *et al.*, 2019; Raza *et al.*, 2019). The preceding literature demonstrated that customers are shifted towards e-Islamic banking for numerous reasons, such as e-service quality, location, religious beliefs, financial benefits, and *Shariah* laws compliance (Yaseen & Kamran, 2019; Raza *et al.,* 2015; Dusuki & Abdullah, 2007). According to Dusuki and Abdullah (2007) and Ahmed *et al.* (2019), the crucial factors of e-Islamic banking are subjective norms, behavioural control, and attitude. However, Amin *et al.* (2014) opposed the conflict between conventional e-banking and Islamic e-banking and emphasized identifying Islamic e-banking services' factual antecedents.

Flores *et al.* (2020), Butt (2018), Parasuraman and Zeithaml (2002), Yaseen and Kamran (2019), and Devaraj *et al.* (2002) have emphasized the significance and vibrant functions of service quality in different industries. Traditionally, the SERVQUAL model was used to measure customer satisfaction and perceived quality (Ahmed *et al.*, 2017; Raza *et al.*, 2015). Previous literature has exhibited that the dimensions of the SERVQUAL model are one of the adequate tools to measure customer satisfaction and customer loyalty in e-service industries (Dewi & Surabaya, 2020; Devaraj *et al.*, 2002; Ahmed *et al.*, 2017; Raza *et al.*, 2020). The Internet & digital media have enhanced the effectiveness of the SERVQUAL model, and customers are moving towards e-commerce, e-banking, and online shopping. Thus, the adaptation of the SERVQUAL model is inescapable to evaluate the e-service quality in cybernetic markets (Al Qaisi & Alrosan, 2020; Raza *et al.*, 2019). Therefore, a group of eminent researchers, Parasuraman *et al.* (2005), proposed an adapted electronic service quality (E-S-QUAL) model with multiple indicators to evaluate e-service quality effectiveness in a real-time interface. The conventional SERVQUAL model comprises of five standard constructs: 1) reliability, 2) assurance, 3) tangible, 4) responsiveness and 5) empathy with 22 items. However, the proposed E-S-QUAL model of Parasuraman *et al.* (2005) provided four constructs, such as 1) availability of the online system, 2) efficiency, 3) fulfillment, and 4) security & privacy measuring scales. The new E-S-QUAL tool as fulfillment-service quality in different online services has different features, such as privacy, secures the customers' information & data, and evaluates the speed & ease of online interface efficacy. However, fulfillment evaluates the website application, operation, and performance. The online system availability comprises technical infrastructure and websites' effectiveness (Ahmed *et al.*, 2020; Ali & Raza, 2017). The Internet has become the most powerful tool for e-commerce and e-services; therefore, e-services industries, including e-banking, use this instrument as a virtual marketplace. The e-system quality and information of e-services quality have become significant elements of the E-S-QUAL model to assess the e-service quality, e-customer satisfaction, and e-customer loyalty in online services industries (Dewi & Surabaya, 2020; Samsudeen *et al.*, 2020; Rodgers *et al.*, 2005; Vinayek & Jindal, 2011).

The Islamic e-banking sector of Pakistan successfully challenged the developed global e-banking system. This sector implements innovative Islamic e-banking operations methods for e-customer satisfaction and e-customer loyalty (Raza *et al.*, 2019). According to Ahmed *et al.* (2019), Pakistani Islamic banks have incorporated e-services and converted from conventional interfaces to e-banking systems. According to Azizah and Puspito (2021), Raza *et al.* (2015), and Pikkarainen *et al.* (2006), Gardener *et al.* (1999), the e-banking system is effective and efficient, which enhance revenue growth, increase geographic markets, reduces cost, and provides customer's satisfaction. Similarly, the Islamic e-banking sector of Pakistan offers supreme quality through e-banking services to create excellent opinions in customer's minds. Indeed, the finest quality e-services lead to e-customers satisfaction, e-customer retention, and e-customer loyalty. Satisfied customers can further enhance the pool of customers and corporate image (Lodhi, 2020; Caruana, 2002;

Cronin & Taylor, 1992). Previous literature demonstrated the effectiveness of the corporate banking system, but there is a shortage of information regarding the Islamic e-banking system in Pakistan. Thus, the undertaken study is conducted to evaluate the electronic service quality of Islamic banks, e-customer satisfaction, and e-customer loyalty in Pakistani Islamic banks' electronic service quality.

Additionally, this research evaluates the Islamic e-banking services and how customers appraise the Islamic e-banking services in an online environment. The significance of this research has increased during pandemic COVID-19 when people are shifted towards online purchases and online banking systems. The undertaken study employed a modified E-S-QUAL model to examine customer satisfaction and customer loyalty. We also incorporated trust and religiosity as mediating constructs in the perspective of the Islamic banking sector. Previous literature demonstrated the inconclusive results amid multidimensional E-S-QUAL models and examining the mediation. We measured the serial mediation between modified E-S-QUAL dimensions and customer satisfaction & e-customer loyalty. The findings of this research provide significant practical implications to the senior managers of the Islamic banking sector for applying robust marketing strategies to compete with conventional e-banking systems.

Literature Review and Hypotheses Development

The Islamic E-Banking

The conception of Islamic banking has become a prominent feature of Islamic societies, and the Islamic banking sector grows in the developing and developed world. The Islamic banks have introduced several products, which surpassed the conventional banking system (Lodhi, 2020). The Islamic banking sector has provided several alternative products consistent with the Islamic *Shariah* laws compared to the conventional banking sector. Islamic banking has recorded phenomenal financial growth worldwide (Azizah & Puspito, 2021; Metawa & Almossawi, 1998). Like conventional e-banking, Islamic e-banking is a way to perform an online transaction through an internet portal to avail various Islamic e-banking facilities in real-time, for example, online fund transfer, utility bills payment, e-shopping, banking instruments requests, and E-purse facilities, etc. (Zouari & Abdelhedi, 2021).

Islamic E-Banking Service Quality

According to Azizah and Puspito (2021) and Ali and Raza (2017), e-service quality is very relevant to the Islamic e-banking sector because of the online banking services. Previous literature precisely discussed Islamic e-banking and electronic service quality. Previous literature demonstrated a customer's view regarding the e-service quality of Islamic e-banking services. Previous researches also measured the e-service quality of conventional e-banking, for instance, Siu and Mou (2005), Bauer *et al.* (2005), and Shao *et al.* (2009). Similarly, previous studies also examined the electronic service quality of the Islamic e-banking sector, such as Raza *et al.* (2015), Ahmed *et al.* (2020), Butt (2018), Sohail, and Shaikh (2008), and Khan *et al.* (2009). This study is unique in a way, which measuring

the Islamic e-banking service quality through modified E-S-QUAL dimensions with religiosity and trust as the mediators in the Islamic e-banking sector.

E-Customer Satisfaction

Customer satisfaction is experienced or achieved through the medium of electronic or online setting, which is regarded as e-customer satisfaction (Zeithaml, 2002). Additionally, accomplishing the expectancies and necessities of a consumer in e-commerce varies with time due to the unique knowledge and exposure of e-customers (Hayati *et al.,* 2020; Zeithaml *et al.*, 2002). E-customer satisfaction is the customer's assessment regarding the e-transaction in comparison to conventional transactions. According to Boateng *et al.* (2021), Evanschitzky *et al.* (2004), and Samsudeen *et al.* (2020), the significant difference between e-retailing and traditional retailing services is transforming man to machine or transactions through artificial intelligence through the Internet. Therefore, for e-customer satisfaction, modified & innovative improvements are required, and this research bridges the gap between e-customers satisfaction and e-customer loyalty. Previous literature has shaped a substantial research work on e-customer satisfaction, which pointed out numerous elements, for instance, websites characteristics, technology, product characteristics, and shopping, are essential for e-customer satisfaction (Al Qaisi & Alrosan, 2020; Yaseen & Kamran, 2019; Azizah & Puspito, 2021).

E-Customers Loyalty

E-customer loyalty is primarily associated with online customers through tackling their queries and concerns regarding Islamic e-banking. The significance of Islamic e-banking enhances as additional consumers utilize Internet networks in connection with their bank accounts (Sleimi *et al.*, 2020; Singh, 2019; Raza *et al.*, 2020). Our considered modified E-S-QUAL model is significant to enhance e-customer loyalty. Islamic e-banking provides less service cost, ease in transactions, and saves time. According to Lodhi (2020) and Aghdaie *et al.* (2015), when information quality and system quality are remarkable in Islamic e-banking, in response, e-customer satisfaction and e-customer loyalty will enhance. Previous literature emphasized the importance of Islamic e-banking as it permits customers can do transactions 24/7 without any hindrances by observing Islamic Laws. According to Boateng *et al.* (2021), Butt (2018), Iqbal (2020), Dewi and Surabaya (2020), and Nguyen and Leblanc (2002), e-customer loyalty increases when customer frequently uses e-banking services with satisfaction. Hence, it demonstrated that e-customer satisfaction is directly associated with e-customer loyalty. Thus, we framed the hypothesis as below:

H1: E-customer satisfaction has a significant & positive connection with e-customer loyalty.

E-Customers Satisfaction and Modified E-S-QUAL Model

A group of eminent researchers, such as Parasuraman *et al.* (2005), proposed an adapted electronic service quality (E-S-QUAL) model with multiple indicators to evaluate e-service quality effectiveness in a real-time interface. However, the proposed E-S-QUAL model of Parasuraman *et al.* (2005) provided four constructs: availability of the online system, efficiency, fulfillment, and security & privacy with 22 measuring scales. The new E-S-QUAL tool provided different online services features, such as privacy, secure the customer's information & data, and evaluates the speed & ease of online interface efficacy (Zeithaml *et al.*, 2000). However, fulfillment estimates the website application, operation & performance. The online system availability comprises the technical infrastructure and effectiveness of websites (Kumar & Mokha, 2021; Azizah & Puspito, 2021; Raza *et al.*, 2020). E-S-QUAL model, e-system quality, information, and e-services quality have become significant elements to evaluate the electronic service quality of e-customers satisfaction and e-customer loyalty in online services industries (Rahmawati & Sentana, 2021; Chang *et al.*, 2009; Vinayek & Jindal, 2011; Rodgers *et al.*, 2005). The current research evaluates the Islamic e-banking services and how customers evaluate the Islamic e-banking services in an online environment (Al Qaisi & Alrosan, 2020; Yaseen & Kamran, 2019). The undertaken study employed modified E-S-QUAL system dimensions to examine the customer's satisfaction & customer's loyalty.

Hypothesized Direct Relationship

The current study incorporated modified dimensions such as efficiency, security & privacy, fulfillment, availability of the online system, and personal needs of the E-S-QUAL model and evaluate the influence of these dimensions on e-customer satisfaction and e-customer loyalty. Previous literature such as Raza *et al.* (2020), Lodhi (2020), Wu and Chang (2013), Chen and Hitt (2002), and Kheng (2010) demonstrated that efficiency has a significant & positive impact on e-customer satisfaction. Similarly, Yaseen and Kamran (2019), Yen and Lu (2008), Garzaro *et al.* (2020), Amin (2016), Singh and Kaur (2013), and Sakhaei *et al.* (2014) exhibited that security & privacy has a significant and affirmative association with e-customer satisfaction. Previous studies also demonstrated an affirmative and significant association between fulfillment and e-customer satisfaction (Kumar & Mokha, 2021; Singh, 2019; Mahadin *et al.,* 2020; Hammoud *et al.,* 2018; Rajaobelina *et al.,* 2019; Sheng & Leu, 2010; Ali & Raza, 2017; Ahmed *et al.,* 2019; Chen, 2013). Preceding studies, for instance, Hammoud *et al.* (2018), Ho *et al.* (2012), Raza *et al.* (2019), Ahmed *et al.* (2020), Suleman *et al.* (2012), and Amin (2016) have confirmed that the availability of online system has a significant and positive influence on e-customer satisfaction. Finally, studies such as Tanim *et al.* (2021), Raza *et al.* (2019), Brodie (2002), Yoon (2010), Kekar *et al.* (2020), Rahmawati and Sentana (2021), and Amin (2016) have demonstrated that personal needs of customers have an affirmative and significant relationship with e-customer satisfaction. Thus, we formulated the following hypotheses:

H2: The efficiency dimension has a significant & positive relationship with e-customer satisfaction.

H3: Security & privacy dimension has a significant & positive relationship with e-customer satisfaction.

H4: The fulfillment dimension has a significant & positive relationship with e-customer satisfaction.

H5: Availability of online system dimension has a significant & positive relationship with e-customer satisfaction.

H6: Personal needs dimension has a significant & positive relationship with e-customer satisfaction.

Hypothesized Indirect Relationship

We also incorporated trust and religiosity as mediating constructs in our considered E-S-QUAL model in the perspective of Islamic e-banking. We measured the serial mediation between modified E-S-QUAL dimensions and e-customer satisfaction and e-customer loyalty.

Customer's Trust

For e-banking services, trust is the vital element; if the promised features and benefits exceed or at least meet the customer's expectations, the trust establishes between the consumer and organization (Samsudeen *et al.*, 2020; Mayer *et al.*, 1995). In an online services industry or Islamic e-banking industry, trust always plays a significant function in e-transactions where insecurity is widespread, and it is challenging to measure the quality of online products or services before purchase (Kim *et al.*, 2009; Fang *et al.*, 2011; Al Qaisi & Alrosan, 2020; Flores *et al.*, 2020; Palvia, 2009). According to Yousafzai *et al.* (2009), e-banking has a novel dimension of customer's trust due to intrinsic uncertainty of e-transaction, the widespread use of technology, and the careful nature of e-atmosphere. The customer's trust builds on several elements: perceived privacy perceived security, and perceived trustworthiness, especially in Islamic e-banking transactions (Rahmawati & Sentana, 2021; Godwin *et al.*, 2010; Ahmed *et al.*, 2020; Dimitriadis *et al.*, 2011). According to Ahmad and Al-Zubi (2011), Singh (2019), Crumlish and Malone (2009), and Siam (2006), in e-banking transactions, the customer's trust has a multidimensional perception. Customer's trust played a significant mediating role between modified E-S-QUAL dimensions and e-customer satisfaction and e-customer loyalty. Hence, the following hypotheses are framed:

H7A: Trust has a significant and positive serial mediation between efficiency dimension, e-customer satisfaction, and e-customer loyalty.

H7B: Trust has a significant and positive serial mediation between security & privacy dimension, e-customer satisfaction, and e-customer loyalty.

H7C: Trust has a significant and positive serial mediation between fulfillment dimension, e-customer satisfaction, and e-customer loyalty.

H7D: Trust has a significant and positive serial mediation between the availability of online system dimension, e-customer satisfaction, and e-customer loyalty.

H7E: Trust has a significant and positive serial mediation between personal needs dimension, e-customer satisfaction, and e-customer loyalty.

H7F: Trust is a significant & positive mediating construct between e-customer satisfaction and e-customer loyalty.

Religiosity

Several research studies have identified customer's religiosity and concluded that this is a significant factor influencing customer's purchasing behavior (Dodds *et al.*, 1991). The imminence of action and factual existence towards the possession and use of products and services is affected by religious practices (Shaharudin *et al.*, 2010). Religiosity has an immediate connection with consumer behavior, a core point in every belief. Therefore, an exploration of religiosity enables a detailed examination of consumer behavior (Yaseen & Kamran, 2019; Rakrachakarn *et al.*, 2015). There is sufficient literature available regarding the correlation between religiosity and the actions of customers. In the modified E-S-QUAL model, we embedded 'religious belief' as a mediator, an essential component in Islamic e-banking. In traditional banking, interest is an integral element (Butt, 2018; Vitell, 2009). The interest rate is forbidden in Islamic values; therefore, religious belief is fundamental in choosing Islamic e-banking services. Religious belief is a fundamental component for clients who decide on any Islamic banking product (Flores *et al.*, 2020; Bukhari *et al.*, 2020; Dusuki & Abdullah, 2007). Previous literature demonstrated that religious belief is a significant construct in the Islamic e-banking sector (Lodhi, 2020; Ahmed *et al.*, 2019; Haron *et al.*, 1994). Therefore, based on previous studies, we framed the following hypotheses:

H8A: Religiosity has an affirmative & significant serial mediation between efficiency, e-customer satisfaction, and e-customer loyalty.

H8B: Religiosity has an affirmative & significant serial mediation between security & privacy dimension, e-customer satisfaction, and e-customer loyalty.

H8C: Religiosity has an affirmative & significant serial mediation between fulfillment dimension, e-customer satisfaction, and e-customer loyalty.

H8D: Religiosity has an affirmative & significant serial mediation between the availability of online system dimension, e-customer satisfaction, and e-customer loyalty.

H8E: Religiosity has an affirmative & significant serial mediation between personal needs dimension, e-customer satisfaction, and e-customer loyalty.

H8F: Religiosity has a significant and positive mediation between e-customer satisfaction and e-customer loyalty.

Material and Methods

Scaling and Research Design

This study is quantitative and cross-sectional; we incorporated a modified E-S-QUAL model with two new dimensions: 1) the availability of the online system and 2) the customer's personal needs as independent factors. Additionally, we employed two mediating variables: religiosity and trust in e-Islamic banking customer satisfaction and loyalty. We used modified items (scales) from the previous literature; for instance, scales of e-customer loyalty are considered from Ahmed *et al.* (2020), Zeithaml *et al.* (2002), Samsudeen *et al.* (2020), Evanschitzky *et al.* (2004), Al Qaisi and Alrosan (2020), Azizah and Puspito (2021), Lodhi (2020), and Iqbal (2020).

The adapted scales of e-customer satisfaction were taken as a second-order PLS-SEM from the dimensions (efficiency, security & privacy, fulfillment, availability of online system, and personal needs). However, the items of modified constructs are taken from previous literature; for instance, items of efficiency were extracted from Raza *et al.* (2019), Aghdaie *et al.* (2015), Ahmed *et al.* (2019), Butt (2018), Ali and Raza (2017), items (scales) of security & privacy were considered from Ahmed *et al.* (2020), Yaseen and Kamran (2019), and Raza *et al.* (2019). The Modified items of fulfillment and availability of online system were considered from Raza *et al.* (2020), Lodhi (2020), Wu and Chang (2013), Ahmed *et al.* (2020), Chen and Hitt (2002), Ali and Raza (2017), and Kheng *et al.* (2010). However, the modified scales of personal needs were acquired from Shaharudin *et al.* (2010), Yaseen and Kamran (2019), Dusuki and Abdullah (2007), and Ahmed et al. (2020). Though the modified measurement scales of religiosity were considered from Bukhari *et al.* (2020), Rakrachakarn *et al.* (2015), Vitell (2009), and Ahmed *et al.* (2019), and adapted items of trust were taken from Ahmed *et al.* (2017), Fang *et al.* (2011), Yousafzai *et al.* (2009) Dimitriadis *et al.* (2011), Godwin *et al.* (2010), Ahmad and Al-Zubi (2011), and Crumlish and Malone (2009).

Data Collection and Sampling Strategy

The customer survey was conducted from the top five Islamic banks well-versed in online banking and currently taking benefits of e-Islamic banking services. We selected five prestigious and top Pakistani Islamic banks and contacted the customers using the purposive sampling technique through the online and offline procedure. We used a modified five-point Likert scale questionnaire and employed it through emails, social media (LinkedIn), and in-person through personal contacts. We have collected a total of 674 complete responses. Though, we had floated 800 questionnaires. We received 211 replies from Karachi city, 135 responses from Lahore, and 101 from Islamabad/Rawalpindi. However, 56 responses were collected from Multan city, 47 responses from Peshawar, 27 responses from Quetta, 39 from Hyderabad, and 48 responses from Faisalabad. Thus, in this way, we have covered almost all the urban centres of Pakistan.

Estimation Techniques and Software

We employed partial least square–structural equation modeling (PLS-SEM) using the software, Smart-PLS 3.1.6 to examine the survey data (Ringle *et al.*, 2015). In the first step, we examine the measurement model and then evaluate the structural model in the second phase for the analysis purpose. However, first, we analysed the descriptive statistics

of all the constructs. We measured Cronbach's alpha, average variance extracted and composite reliability of each construct, and factor loading of each item to evaluate the measurement model. First, we measured the discriminant and convergent validities using cross-loading, HTMT, and Fornell and Larcker's (1981) methods. Thus, in this way, we evaluated the hypothesized measurement model. However, the second phase examined the structural model using the R-square of individual endogenous variables, path co-efficient analysis. Through path co-efficient analyses, we also examined the direct impact between independent and dependent variables. Additionally, we measured the serial mediation through PLS-SEM (path co-efficient analyses) using Smart-PLS (Ahmed *et al.*, 2019). Finally, we established the validation of a hypothesized structural model of e-customer satisfaction and e-customer loyalty through Stone-Geisser (Q^2) and SRMR indicators.

Respondents' Demography

We selected 674 responses; however, we had floated 800 questionnaires, but the rest of the responses was found inadequate and incomplete. Thus, the response rate was 84.25 %. For the employing of PLS-SEM, 674 are a sufficient sample (Ahmed *et al.,* 2017). The findings of the Table 1 demonstrate the demographic analyses of respondents. The results showed that we had taken 366 (54.30 %) male respondents and 308 (45.70 %) females respondents. Table 1 exhibited the details of the entire demographic statistics.

Estimations and Data Analysis

We employed partial least square–structural equation modeling (PLS-SEM) using the software, Smart-PLS 3.1.6 to examine the survey data (Ringle *et al.*, 2015). We examine the measurement model in the first step for the analysis purpose and then evaluate the structural model in the second step. However, first, we analysed the descriptive statistics of all the constructs.

Descriptive Statistics

We have analysed descriptive statistics of all the constructs to measure the initial characteristics of considered factors. First, we had converted data into z-scores and then drawn different statistics, for instance, standard deviation (SD), skewness (SK), and kurtosis. The outcomes of Table 2 exhibited that our collected data followed the central limit theorem, and data showed the normality pattern (SD&SK ranged ±1.5 and kurtosis ranged ±3). Hence, we can now proceed with further analysis of PLS-SEM (Raza *et al.*, 2020; Lu *et al.*, 2020).

Table 1

Respondents' Demographic Profile

Demographics		Frequency	Per cent
Gender	Male	366	54.30 %
	Female	308	45.70 %
Marital Status	Single	213	31.60 %
	Married	461	68.40 %
Age (In Years)	20–25	134	19.88 %
	26–30	164	24.33 %
	31–35	169	25.07 %

Demographics		Frequency	Per cent
	36-40	120	17.80 %
	More than 40	87	12.91 %
Experience (In Years)	5–10	187	27.74 %
	11–15	267	39.61 %
	16–20	154	22.85 %
	More than 20	66	9.79 %
Income (In PKR *)	20–30	185	27.45 %
	31–40	172	25.52 %
	41–50	149	22.11 %
	50–60	90	13.35 %
	More than 60	78	11.57 %
Education	Under Graduation	204	30.27 %
	Graduation	302	44.81 %
	Post-Graduation	168	24.93 %
Total – N		**674**	

Source: Authors' calculations

Measurement Model

According to Hair *et al.* (2019), Raza *et al.* (2020), the PLS-SEM method consisted of two phases. The first phase was to examine the measurement model. For this purpose, we measured the individual factor loading (FL) of each item of constructs. We examined the average variance extracted (AVE), Cronbach's alpha (CA), and composite reliabilities (CR) of constructs. The outcomes of Table 2 and Figure 1 exhibit that the FLs of each item are more significant than 0.70. Likewise, the CA, rho_A, and CR readings are also higher than 0.70. Hence, the condition of convergent validity has been met (Hair *et al.*, 2019; Ahmed *et al.*, 2017). Additionally, the measures of AVE are more significant than 0.50. Therefore, the discriminant validity of constructs is also satisfied (Ahmed *et al.*, 2019; Fronell & Lacrker, 1981). Hence, these outcomes showed the validation of the measurement model because initial conditions are met (Lu *et al.*, 2020).

Table 2

Measurement Model and Descriptive Statistics

Constructs		Items	FL	CA	rho_A	CR	AVE	SD	SKE	KUR	ECS
E-Customers' Satisfaction (ECS)	Efficiency	EF1	0.852	0.722	0.740	0.843	0.643	1.101	-1.061	1.034	ECS: CA=0.958; rho_A=0.963; CR=0.965; AVE=0.582; SD=1.102; SKE=1.014; KUR=1.102
		EF2	0.722								
		EF3	0.826								
	Security & Privacy	SP1	0.811	0.873	0.883	0.908	0.663	1.009	-1.181	1.152	
		SP2	0.862								
		SP3	0.771								
		SP4	0.868								
		SP5	0.754								
	Fulfillment	FUL1	0.874	0.829	0.839	0.888	0.666	1.107	-1.031	1.053	
		FUL2	0.796								
		FUL3	0.683								
		FUL4	0.896								
	Availability of Online System	AOS1	0.907	0.842	0.852	0.895	0.682	1.106	-1.011	1.109	
		AOS2	0.769								
		AOS3	0.885								
		AOS4	0.729								
	Personal Needs	PN1	0.838	0.698	0.722	0.816	0.600	1.172	-1.091	1.062	
		PN2	0.829								
		PN3	0.641								
Religiosity		REL1	0.772	0.791	0.797	0.878	0.707	1.061	-1.004	1.011	
		REL2	0.877								
		REL3	0.869								
Trust		TRU1	0.720	0.854	0.872	0.886	0.568	1.091	-1.215	1.055	
		TRU2	0.709								
		TRU3	0.726								
		TRU4	0.705								
		TRU5	0.809								
		TRU6	0.839								
E-Customer Loyalty		ECL1	0.953	0.935	0.943	0.952	0.796	1.071	-1.221	1.105	
		ECL2	0.838								
		ECL3	0.755								
		ECL4	0.951								
		ECL5	0.946								

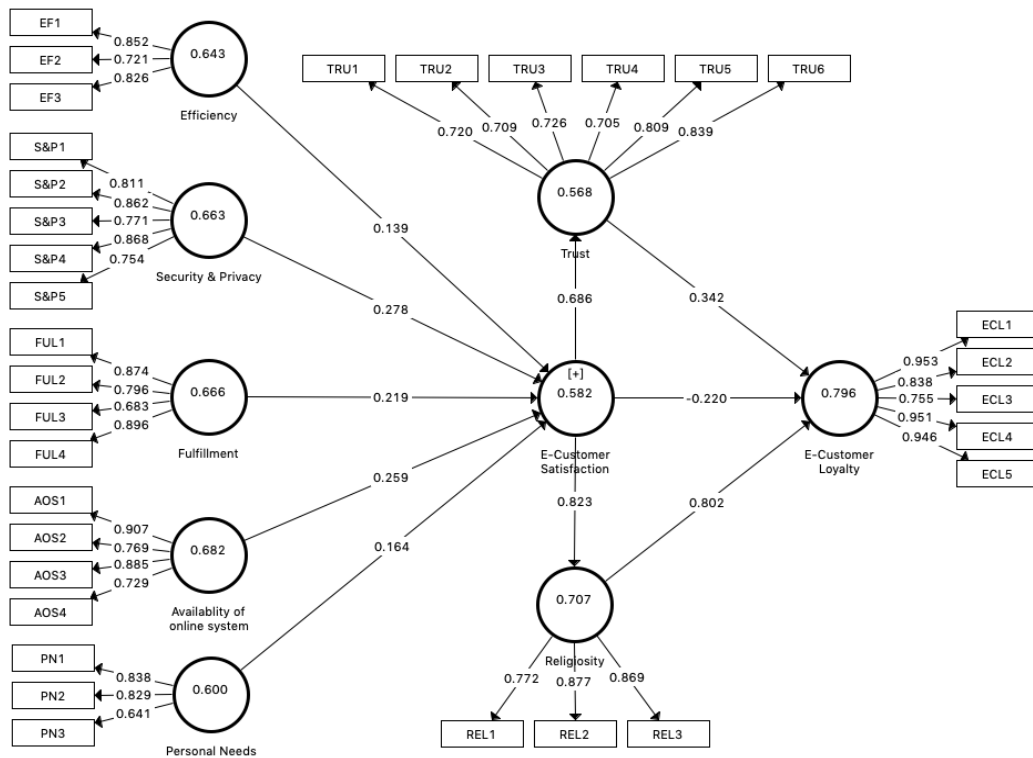*Source: Authors' calculations*

Figure 1. Smart-PLS – Factor Loading & Average Variance Extracted (Modified E-S-QUAL Model)
Source: Authors' calculations

The Fornell and Larkers (1981) criterion examined the discriminant validity; this method provided the square root values of AVE. The readings are provided in a diagonal (highlighted in Table 3), and these readings are more significant than the correlation of other variables. Thus, the discriminant validity of constructs has been met. Therefore, it is established that the considered measurement model is valid for the hypothesized modified E-S-QUAL model.

Table 3

The Fornell–Larcker (1981) Criterion – Discriminant Validity

Constructs	AOS	ECL	ECS	EF	FUL	PN	REL	SP	TRU
Availability of the online system	**0.826**								
E-Customer Loyalty	0.729	**0.892**							
E-Customer Satisfaction	0.749	0.675	**0.763**						
Efficiency	0.814	0.596	0.674	**0.802**					
Fulfillment	0.818	0.617	0.665	0.720	**0.816**				
Personal Needs	0.798	0.639	0.730	0.771	0.791	**0.775**			
Religiosity	0.809	0.804	0.723	0.758	0.753	0.693	**0.841**		
Security & Privacy	0.773	0.575	0.719	0.715	0.746	0.685	0.758	**0.815**	
Trust	0.706	0.854	0.686	0.591	0.634	0.757	0.827	0.558	**0.753**

Source: Authors' calculations

The loading and cross-loading analyses are other criteria to measure discriminant validity that support the measurement model. The findings of Table 4 exhibited that the cross-loading difference is higher than 0.1, and loadings of every single item of a construct are more significant than the other items of constructs as highlighted in rows and columns (Raza *et al.*, 2020). Hence, it is confirmed the validation of hypothesized measurement model of modified E-S-QUAL dimensions.

Table 4

Cross Loadings

Indicators	AOS	ECL	EF	FUL	PN	REL	SP	TRU
AOS1	**0.907**	0.553	0.820	0.863	0.790	0.611	0.617	0.553
AOS2	**0.769**	0.498	0.727	0.730	0.680	0.724	0.638	0.509
AOS3	**0.885**	0.498	0.764	0.832	0.779	0.530	0.551	0.518
AOS4	**0.729**	0.639	0.570	0.575	0.590	0.550	0.523	0.505
ECL1	0.720	**0.953**	0.571	0.578	0.587	0.865	0.533	0.803
ECL2	0.624	**0.838**	0.540	0.603	0.649	0.761	0.535	0.811

Indicators	AOS	ECL	EF	FUL	PN	REL	SP	TRU
ECL3	0.518	**0.755**	0.435	0.427	0.461	0.609	0.413	0.610
ECL4	0.692	**0.951**	0.562	0.556	0.565	0.838	0.542	0.782
ECL5	0.675	**0.946**	0.536	0.563	0.569	0.821	0.523	0.778
EF1	0.758	0.508	**0.852**	0.730	0.795	0.748	0.764	0.506
EF2	0.484	0.359	**0.721**	0.593	0.461	0.427	0.649	0.341
EF3	0.808	0.547	**0.826**	0.669	0.794	0.615	0.603	0.551
FUL1	0.807	0.556	0.719	**0.874**	0.812	0.627	0.563	0.593
FUL2	0.750	0.523	0.686	**0.796**	0.584	0.746	0.654	0.546
FUL3	0.506	0.384	0.691	**0.683**	0.486	0.452	0.562	0.381
FUL4	0.796	0.532	0.802	**0.896**	0.787	0.605	0.593	0.529
PN1	0.808	0.535	0.703	0.739	**0.838**	0.588	0.546	0.591
PN3	0.775	0.511	0.751	0.737	**0.829**	0.754	0.650	0.531
PN3	0.421	0.446	0.360	0.412	**0.641**	0.458	0.320	0.547
REL1	0.465	0.520	0.546	0.637	0.707	**0.772**	0.659	0.533
REL2	0.661	0.818	0.547	0.554	0.547	**0.877**	0.534	0.749
REL3	0.625	0.817	0.542	0.624	0.666	**0.869**	0.543	0.792
SP1	0.646	0.502	0.711	0.678	0.642	0.625	**0.811**	0.465
SP2	0.723	0.544	0.773	0.765	0.753	0.757	**0.862**	0.542
SP3	0.489	0.385	0.675	0.667	0.483	0.464	**0.771**	0.374
SP4	0.756	0.511	0.844	0.729	0.789	0.743	**0.868**	0.504
SP5	0.488	0.372	0.713	0.592	0.474	0.438	**0.754**	0.360
TRU1	0.406	0.446	0.360	0.390	0.580	0.453	0.345	**0.720**
TRU2	0.397	0.422	0.347	0.413	0.497	0.451	0.357	**0.709**
TRU3	0.506	0.479	0.448	0.438	0.621	0.489	0.373	**0.726**
TRU4	0.388	0.417	0.339	0.394	0.495	0.430	0.347	**0.705**
TRU5	0.717	0.745	0.560	0.563	0.583	0.736	0.517	**0.809**
TRU6	0.619	0.646	0.519	0.582	0.645	0.636	0.501	**0.839**

Source: Authors' calculations

Additionally, the findings of Table 5 demonstrate the analyses of the Heterotrait–Monotrait (HTMT) ratio of correlation. The HTMT should be less than 0.85 (Henseler *et al.*, 2015) since the values of the HTMT ratio of correlation of constructs are less than 0.85. Therefore, both convergent and discriminant validity criteria are met, and our considered hypothesized measurement model is validated for e-customer loyalty and e-customer satisfaction.

Table 5

Heterotrait–Monotrait (HTMT) Ratio

Constructs	AOS	ECL	ECS	EF	FUL	PN	REL	SP	TRU
Availability of the online system									
E-Customer Loyalty	0.849								
E-Customer Satisfaction	0.841	0.711							
Efficiency	0.837	0.715	0.765						
Fulfillment	0.781	0.695	0.683	0.784					
Personal Needs	0.632	0.802	0.804	0.649	0.728				
Religiosity	0.815	0.736	0.849	0.838	0.832	0.764			
Security & Privacy	0.782	0.627	0.707	0.762	0.801	0.840	0.706		
Trust	0.802	0.770	0.736	0.707	0.721	0.756	0.829	0.611	

Source: Authors' calculations

Structural Model

We have evaluated the structural model through path analyses between constructs, evaluation of R^2, predictive relevance (Q^2), and SRMR measurement. The findings of Table 6 and Figure 2 exhibited R-square values that confirmed the goodness of fitness of the structural model. Figure 2 showed that the percent of change in endogenous factor due to the independent variables measured R^2. Table 6 demonstrates that 87.0 % variation in e-customer loyalty is experienced due to e-customer satisfaction, religiosity, and trust. Similarly, the coefficient of determination (R^2) of religiosity is 69.2 %, and trust is 48.8 %, revealing the change in religiosity and trust due to the respective independent variables. However, e-customer satisfaction experienced 100 % change because of the second-order variable, and it is derived from the similar items of modified E-S-QUAL dimensions. The second step for evaluating the structural model is to evaluate the direct and indirect relationship (serial mediation) between the variables through co-efficient analysis.

R-Square and R-Square Adjusted

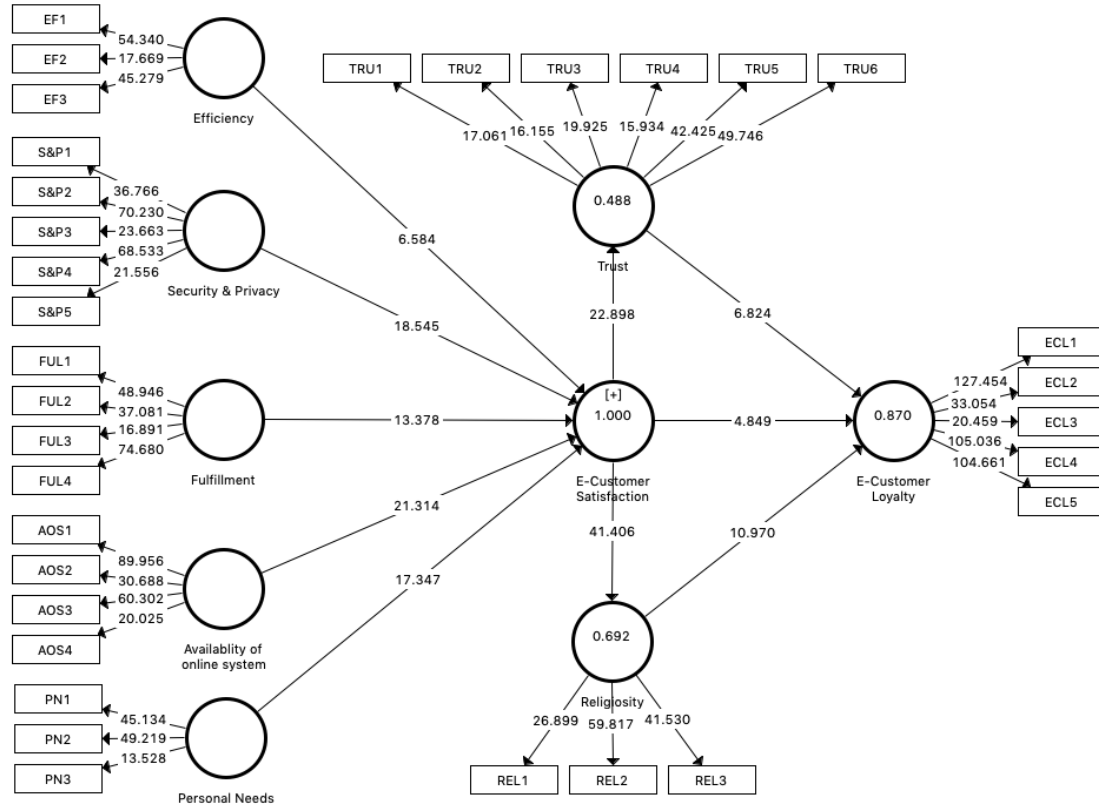| Factors	R Square	R Square Adjusted
E-Customer Loyalty	0.870	0.867
E-Customer Satisfaction	1.000	1.000
Religiosity	0.692	0.677
Trust	0.488	0.469

Source: Authors' calculations

Figure 2. Smart-PLS – Path Analyses with R-Square Values (Modified E-S-QUAL Model)
Source: Authors' calculations

Postulated Direct Association

The direct association between independent and dependent variables was analysed, and results are reported in Table 7. Additionally, the path co-efficient (standardized regression weights) also validated the structural model between the independent and dependent variables. Similarly, Figure 2 also demonstrated the T-values of a direct and indirect relationship between the variables. The findings of Table 7 exhibited that efficiency, security & privacy, availability of the online system, and fulfillment have a positive and significant influence on e-customer satisfaction (ECS). Similarly, e-customers have a linear and an affirmative relationship with e-customer loyalty (ECL). Hence, it is conclusively established that H1 to H6 is substantiated because of the significance values (p<0.01) and T-values (T±>1.96). However, security & privacy has the highest impact of 29.30 % on e-customer satisfaction, and the availability of online system has an equal significance with 29.30 % for the e-customer satisfaction. It is also concluded from Table 7 that e-customer satisfaction is directly translated into e-customer loyalty as ECS has an impact of 22.40 % on ECL.

Postulated Direct Association

Hypotheses	Direct Path Analyses	Standardized Regression Weights	T-Statistics	P-Values	Decision
H1	EF -> ECS	0.098	6.584	0.000**	Supported
H2	SP -> ECS	0.293	18.545	0.000**	Supported
H3	FUL -> ECS	0.197	13.378	0.000**	Supported
H4	AOS -> ECS	0.293	21.314	0.000**	Supported
H5	PN -> ECS	0.180	17.347	0.000**	Supported
H6	ECS -> ECL	0.224	4.849	0.000**	Supported

*Note: Null Hypotheses Rejected at **p<0.01*
Source: Authors' calculations

Serial Mediation Analyses

We employed bootstrapping method to examine the serial mediation of religiosity and trust through the serial path of e-customer satisfaction with e-customer loyalty (Ahmed *et al.*, 2019). The findings of Table 8 exhibited that religiosity and trust have a positive and significant mediating influence between dimensions of the modified E-S-QUAL model, for instance, security & privacy, efficiency, fulfillment, availability of the online system, and personal needs, and e-customer loyalty through serial

mediation of e-customer satisfaction. Hence, it is finally concluded that hypotheses H7A to H7E are accepted and retained because T>±1.96 & p<0.01, and a value of zero does not occur between the lower and upper interval of BCCI (Hayes & Rockwood, 2020). Similarly, hypotheses H8A to H8E are also substantiated. Likewise, the findings of Table 8 also exhibited that religiosity and trust have a cogent and affirmative impact on e-customer satisfaction and e-customer loyalty. Hence, it is finally confirmed that hypotheses H7F and H8F are also validated.

Table 8

Serial Mediation Analysis

Hypotheses	Serial Mediation Path Analyses	Path Coefficient	T Statistics	P** Values	BCCI 2.5 %	BCCI 97.5 %
H7A	EF -> ECS -> REL -> ECL	0.066	5.295	0.000	0.158	0.233
H7B	SP -> ECS -> REL -> ECL	0.196	9.013	0.000	0.041	0.089
H7C	FUL -> ECS -> REL -> ECL	0.132	9.274	0.000	0.107	0.161
H7D	AOS -> ECS -> REL -> ECL	0.196	10.346	0.000	0.097	0.146
H7E	PN -> ECS -> REL -> ECL	0.120	9.765	0.000	0.550	0.793
H7F	ECS -> REL -> ECL	0.670	10.844	0.000	0.156	0.240
H8A	EF -> ECS -> TRU -> ECL	0.070	6.979	0.000	0.052	0.090
H8B	SP -> ECS -> TRU -> ECL	0.024	4.482	0.000	0.014	0.034
H8C	FUL -> ECS -> TRU -> ECL	0.047	5.594	0.000	0.032	0.066
H8D	AOS -> ECS -> TRU -> ECL	0.043	6.750	0.000	0.032	0.056
H8E	PN -> ECS -> TRU -> ECL	0.070	7.208	0.000	0.052	0.090
H8F	ECS -> TRU -> ECL	0.240	7.100	0.000	0.177	0.309

Note: Null Hypotheses Rejected at: **p<0.01; BCCI: Bias Corrected Confidence Interval
Source: Authors' calculations

Stone-Geisser (Q^2) and SRMR indicator

The outcomes of Table 9 exhibit that Stone-Geisser or the predictive relevance (Q^2) validated the predictive relevance of every endogenous model such as ECS, REL, TRU, and ECL (1.000, 0.678, 0.472 & 0.457 respectively), and their respective independent variables. The outcomes of Table 10 showed the SRMR indicators, such as saturated and estimated SRMR models. According to Henseler *et al.* (2015) and Raza *et al.* (2019), the saturated SRMR model is considered the best fit, which also validated the goodness of fit of the hypothesized structural model.

Table 9

Stone-Geisser (Q^2)

Constructs	Q^2 Predict
ECS	1.000
EF	
SP	
FUL	
AOS	
PN	
REL	0.678
TRU	0.472
ECL	0.457

Source: Authors' calculations

Table 10

SRMR Indicators

Saturated Model	Estimated Model
0.061	0.166

Source: Authors' calculations

Discussions and Conclusion

The current study has employed a modified E-S-QUAL model to evaluate e-customer satisfaction and e-customer loyalty. We have taken efficiency, fulfillment, security & privacy, availability of the online system, and personal needs as the dimensions of the modified E-S-QUAL model. The study's findings exhibited that the dimension efficiency has a significant and positive association with e-customer satisfaction and e-customer loyalty. However, security & privacy has the highest impact on e-customer satisfaction, and the availability of an online system has an equal significance for e-customer satisfaction. Preceding studies also depicted similar outcomes, for instance, Zouari and Abdelhedi (2021), Wu and Chang (2013), Chen and Hitt (2002), Kheng (2010), Raza *et al.* (2020), Yen and Lu (2008), Singh (2019), Ahmed *et al.* (2019), Sakhaei *et al.* (2014), Singh and Kaur (2013), Amin (2016), and Yaseen and Kamran (2019. The findings further demonstrated that fulfillment and personal needs are significantly and positively correlated with e-customer satisfaction and e-customer loyalty in the perspective of Islamic e-banking services. The previous literature also confirmed similar results, for example, Sleimi *et al.* (2020), Suleman *et al.* (2012), Raza *et al.* (2019), Ho *et al.* (2012), Hammoud *et al.* (2018), Ahmed *et al.* (2020), and Amin (2016). Hence, it is confirmed that our hypothesized modified E-S-QUAL model is useful to assess the direct association between modified dimensions and e-customer satisfaction and e-customer loyalty. Additionally, we had incorporated customer trust as a mediating factor between modified dimensions of the E-S-QUAL model and e-customer satisfaction and e-customer loyalty. The mediation

outcomes exhibited that the customer trust has an affirmative and significant serial mediation between dimensions of the modified E-S-QUAL model and e-customer satisfaction and e-customer loyalty. We also evaluated the mediating effect of trust between e-customer satisfaction and e-customer loyalty, which confirmed the mediation of trust between ECS and ECL. The results of the current study are consistent with preceding studies, such as Hayati *et al.* (2020), Dewi and Surabaya (2020), Mayer *et al.* (1995), Fang *et al.* (2011), Palvia (2009), Kim *et al.* (2009), Ahmed *et al.* (2017), Ali and Raza (2017), Godwin *et al.* (2010), Dimitriadis *et al.* (2011), Ahmad and Al-Zubi (2011), and Crumlish and Malone (2009). We also incorporated religiosity as a mediator in our considered modified E-S-QUAL model. The outcomes also verified that religiosity has a serial mediation in an association of modified E-S-QUAL dimensions, e-customer satisfaction, and e-customer loyalty. Finally, we examined the impact of religiosity as mediating factor between e-customer satisfaction and e-customer loyalty. The outcomes proved a significant and positive impact of religiosity as a mediator. These findings are also consistent with the previous literature, for instance, Tanim *et al.* (2021), Kumar and Mokha (2021), Bukhari *et al.* (2020), Ahmed *et al.* (2019), Dodds *et al.* (1991), Shaharudin *et al.* (2010), Dusuki and Abdullah (2007), Haron *et al.* (1994), and Rakrachakarn *et al.* (2015). The research results showed that the Islamic e-banking sector should increase awareness of their services, improve promotional and advertisement campaigns for long-run competitive growth. Moreover, Islamic banks should educate ordinary people that their products comply with *Islamic Shariah* values (Zouari & Abdelhedi, 2021).

Practical Contribution and Implications

The research provides the basis for decision-making and strategies to improve the effectiveness of services of Islamic e-banking, especially for policymakers and higher management of Islamic banks. Islamic banks should consider customer's psychological variables to understand customer's acceptance of Islamic products. Besides, it is still necessary to recognize some essential elements aspiring to customer acceptance towards Islamic e-banking services. This will also boost the present situation for Islamic bank management, receiving more customers following *Shariah law* for e-banking services. The present and prospective customers of the Islamic products may increase product demand and help for anticipated e-customer satisfaction and e-customer loyalty.

Additionally, this research provides guidelines to the senior management of Islamic banks to devise novel strategies to compete with the conventional banking sector. The findings of the undertaken study provide two new dimensions, for instance, availability of the online system and personal needs as modified E-S-QUAL model. The proposed model helps the senior management of the Islamic banking sector integrate these two new dimensions for more competitive performance. Additionally, the findings demonstrated that religiosity and trust are predominant for customer satisfaction and loyalty. Thus, senior management of the Islamic banking sector may add religiosity and trust in their functional and marketing strategies.

Theoretical Implications

The undertaken study demonstrated important theoretical implications because it provides the fundamental foils to future researchers to replicate this modified model in different industries. Moreover, the derived modified conceptual model may help future researchers to carry out further studies in a different geographical context.

Limitations and Future Areas of Research Studies

The undertaken study has some specific limitations; for instance, we have taken only important urban centres of Pakistan. Therefore, it is recommended that future researchers may take more urban and semi-urban centres for more generalizable outcomes. We have taken only Pakistan to carry out this research; however, the prospective researcher may take more Islamic countries to confirm the modified model's robustness. This research could not check the causality between the variable. Thus, future studies may incorporate cause & effect models. Finally, we have considered specific modified dimensions for the E-S-QUAL model and mediators; however, future researchers may take additional dimensions and mediators for more robust outcomes.

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