



RESEARCH PAPER

Determining SST Satisfaction and SST Loyalty through SST User Characteristics: The Mediating Role of Co-creation Experience

¹Muhammad Shahid Iqbal and ²Masood Ul Hassan*

1. PhD Scholar, Department of Commerce, Bahauddin Zakariya University, Multan, Punjab, Pakistan
2. Professor, Department of Commerce, Bahauddin Zakariya University, Multan, Punjab, Pakistan

*Corresponding Author: masood@bzu.edu.pk

ABSTRACT

The objective of the study is to empirically investigate the relationship between SST (self-service technologies) user characteristics, co-creation experience, SST satisfaction, and SST loyalty. Here SST user characteristics (technology innovativeness and technology optimism are independent variables, SST satisfaction, and SST loyalty are dependent variables and co-creation experience (cognitive experience, hedonic experience, and pragmatic experience) is the mediating variable. The population of the study is mobile banking application users in Pakistan. Data is collected through self-administrated survey questionnaire from 410 respondents. Partial Least Square Structural Equation Modeling (PLS-SEM) is employed for data analysis. Results found the positive significant relationship between SST user characteristics and SST satisfaction, and SST loyalty. Study also confirms the positive significant relationship co-creation experience and SST satisfaction, and SST loyalty. Further, Results found the full mediation of co-creation experience between technology innovativeness and SST satisfaction, and SST loyalty and partial mediation between technology optimism and SST satisfaction, and loyalty. This study adds several academic and practical contributions for SST providers. The limitations and future research directions are also given in the study.

KEYWORDS Co-creation Experience, SST loyalty, SST Satisfaction, Technology Innovativeness, Technology Optimism

Introduction

Over the centuries, economies have undergone numerous transformations, culminating in the current era that characterized by an emphasis on creating enduring and long lasting customer experiences in the realm of marketing (Nuseir et al., 2023; Katsikeas, Leonidou, Zeriti, 2020; Pine & Gilmore, 1999). In the face of modern business competition, organizations are actively seeking innovative ways to distinguish their service offerings from those of rivals, all with the goal of delivering exceptional customer experiences (Sheth, Jain, Ambika, 2023). Hence, delivering an exceptional experience to the customers can be regarded as a significant marketing strategy and a novel mechanism for generating value that benefits the customer and company (Zhang, Liang, Li, 2024; Carù & Cova, 2003). As a result, corporate sector organizations are actively pursuing novel opportunities to offer improved experiences by understanding the process of value creation for the customers (Akaka, Vargo, & Schau, 2015). Moreover, they are proficiently creating opportunities to engage the customers with the organization in shaping extremely personalized services, a concept recognized as co-creation of value (Vasil et al., 2024; Leong et al., 2024; Buhalis et al., 2022; Prahalad & Ramaswamy, 2004a; Solakis et al., 2022; Vargo & Lusch, 2008a; b; Vargo et al., 2008). In other words, when customers actively engage in the process of creating value, it is recognized as value co-creation.

The value co-creation within SSTs occurs through the concept of resource integration. The SSTs are acknowledged as operational resources (Barnes et al., 2000; Payne et al., 2009), encompassing functional elements for instance explicit knowledge and interactive features (Hughes et al., 2017). The consumers turned into partial employees according to Meuter and Bitner (1998), as they engage in creating their own services with limited or no assistance from organizational staff (Bitner et al., 1997), thus shifting their role toward active participants (Hilton et al., 2013). Initially, SSTs were primarily associated with basic and straightforward tasks. However, the current expectation is for customers to conduct more intricate and unique service transactions through SSTs, as noted by Quinn et al. (1990). This evolution shows a transition from simplicity to a more diverse and complex usage of SSTs by customers. Technology-driven services are emerging as distinguishing factors within the market landscape (Verhoef et al., 2009). A growing proportion of customers are adopting technology to carry out their service transactions, reducing their reliance on the organization's staff members (Meuter et al., 2000).

Irrespective of the progress made in SSTs, academic exploration within the context of value co-creation remains primarily focused on conventional interfaces (Hilton et al., 2013). Also, there exists a notable scarcity of existing research regarding technological interfaces as a means of facilitating co-creation factor (Liljander et al., 2006). In this vein, this study aims to empirically investigate

1. the relationship between SST user characteristics and co-creation experience
2. the relationship between creation experience and SST loyalty
3. the relationship between creation experience and SST satisfaction
4. the mediating role of co-creation experience between SST user characteristics and SST loyalty
5. the mediating role of co-creation experience between SST user characteristics and SST satisfaction

Literature Review

Self Service Technologies (SSTs)

Self-Service Technology (SST) is the technological interface used to facilitate the service users to get their services without service employee involvement (Meuter, Bitner, Ostrom, & Brown, 2005). The examples include internet-based services, interactive kiosks, self-checkouts, automated airline check-in systems, and online shopping etc. SSTs interfaces are growing and are increasingly being applied by service firms in the service delivery processes (Lee, 2015). This innovation in digitalized services i.e. SSTs led by advances in ICT, automation, and collaboration engineering have significantly revamp the service firms' abilities in providing range of services to customers including e-Commerce, e-Learning, e-Logistics, e-Government, e-Communication, and numerous other services and service industries (Chen & Tseng, 2013; Nof, et al., 2015).

SST User Characteristics

Parasuraman (2000) proposed a preliminary conceptualization of TR, which consisted of four dimensions: innovativeness, optimism, discomfort, and insecurity. Former two dimensions are called motivators that enhance TR while the last two are the inhibitors that hinder the TR. Each dimension of TR is analyzed separately in literature to gain a more comprehensive understanding of the concept and its implications (Lam,

Chiang, & Parasuraman, 2008; Son & Han, 2011). In a study conducted by Chen et al. (2009), it was found that discomfort and insecurity were not significant negative factors that affected customer satisfaction and long-term usage intention when adopting SST services. Current study considers only two dimensions of TR for the SST user characteristics, which are technology optimism and technology innovativeness. Innovativeness refers to an individual's inclination to be at the forefront of technology adoption and acceptance as a trendsetter and influential figure (Parasuraman, 2000). Individuals who possess innovativeness exhibit a curiosity towards new technologies and possess a belief in their ability to navigate uncertainties that arise from using new technologies (Walczuch, Lemmink, & Streukens, 2007). Technology optimism is defined as a positive belief about technology to increase control, flexibility and efficiency in life (Parasuraman, 2000; Vize et al., 2013).

Co Creation Experience

Co-creation experience can be evaluated based on the fulfillment of expected co-creation benefits in order to balance customer expectations and perceptions, as highlighted by the gaps model (Zeithaml et al., 1990). It suggests that the actual benefits that customers receive from co-creation will determine their overall experience. The passage identifies six dimensions that contribute to the overall co-creation experience. The hedonic experience dimension refers to the actual hedonic benefits that customers receive from co-creation, which may include feelings of pleasure, enjoyment, and excitement. The cognitive experience dimension refers to the actual cognitive benefits received from co-creation, such as knowledge gained about products, services, and technologies. The social experience dimension includes the actual social benefits received from co-creation, such as building relationships with other participants. The personal experience dimension refers to the actual personal benefits received from co-creation, such as status and self-efficacy. The pragmatic experience dimension includes the actual pragmatic benefits received from co-creation, such as solutions that better meet personal needs. Finally, the economic experience dimension includes the actual economic benefits received from co-creation, such as monetary rewards.

SST Loyalty and Satisfaction

Lee, Lee, and Feick (2001) provided a definition of customer loyalty that includes word-of-mouth endorsement, better prospect of purchasing, and repeated purchasing of products or services. On the other hand, Pearson (1996) described customer loyalty as a customer's favorable attitude towards a company, a commitment to regularly purchase the products or services a company offer, and a willingness to recommend those products and to others as well. The existing literature suggests service quality as a vital determinant of customer loyalty (Boulding et al., 1993; Cronin & Taylor, 1992; Iqbal, Hassan, & Habibah, 2018; Hassan, Iqbal, & Habibah, 2020; Makanyeza & Chikazhe, 2017).

Customer satisfaction is the assessment about a product or service's ability to fulfill person's desires and hopes (Wilson et al., 2016), which also includes the emotional component related to how well the good or service offers a satisfying consumer experience (Oliver, 1999). As a critical element of marketing research and organizational performance as well as customer satisfaction drives loyalty, re-patronage, constructive words, and firm's success (Oliver, 1999; Anderson, Fornell, & Lehmann, 1994).

Service dominant logic (S-D Logic)

S-D Logic (Vargo & Lusch, 2008b) is a theoretical framework that focuses on the exchange of value between two or more parties. It is an alternative to the traditional goods-dominant logic (GDL). Overall, S-D Logic emphasizes the importance of understanding customer needs and co-creating value with them through the exchange of services, resources, and knowledge. Studying S-D Logic in the context of SSTs is important for several reasons. For example, SSTs are becoming increasingly prevalent in many service industries, such as banking, retail, and hospitality. Second, SSTs often require customers to take on a more active role in the service process, which aligns with the principles of S-D Logic that emphasize the co-creation of value between customers and service providers.

Stimulus Organism Response (SOR) Model

In the classical Stimulus Organism Response (SOR) model, the stimulus is defined as an element which affects an individual internal state. It can be described as a power that can excite someone in a particular situation (Eroglu, Machleit, & Davis, 2001). The SOR model has been adopted in various research in order to examine the link between input (i.e., Stimulus), the process (i.e., organism) and output (i.e., Response). The SOR has been widely used in the field of technology, including advertisement, website and computer (Eroglu, Machleit, & Davis, 2003; Mollen & Wilson, 2010). Not only this, but even researchers have also applied this framework to explain the behaviors of tourist, consumer behaviors and online purchase intentions (Chen, King, & Suntikul, 2019; Rajaguru, 2014; Zhu et al., 2020).

Relationship between SST User Characteristics and Co-creation Experience

There has been a greater emphasis on the importance of customers' perceptions of product innovation in studies (Shams et al., 2015). Innovativeness involves creating new and unique ways to engage customers, such as offering membership programs, deals, and marketing campaigns through various channels. The concept of innovativeness highlights the importance of collaborating with customers to co-create value, interacting with stakeholders, developing business models that prioritize customers, and delivering personalized experiences for virtual customers (Pralhad & Krishnan, 2008). The creation of value co-creation platforms is gaining recognition as a favorable approach to innovation, aligned with current transformations (Pralhad & Ramaswamy, 2003; Prahalad & Ramaswamy, 2004b; Romero & Molina, 2009).

Vargo and Lusch (2004) argue that the S-D logic suggests a theoretic basis for the relationship between innovativeness and value co-creation. In this regard, innovation is seen as a means to enable the exchange of information and knowledge between customers and employees, resulting in collaborative efforts to create value (Cabiddu, Lui, & Piccoli, 2013). Spohrer and Maglio (2008) further suggest that the service industry has witnessed a rapid development of co-creation value through innovations. Prahalad and Ramaswamy (2004a) assert that in service industries, unique value formation is based on customers' experiences, and hence innovative experiences among customers are crucial for value co-creation. Chathoth et al., (2013) posit that customers' positive perceptions of a business's innovativeness influence their participation in value co-creation. Yet, these arguments have only received theoretical support and have not been empirically tested.

Above arguments lead to the following hypotheses:

H1: SST User characteristics have a significant relationship with Co-creation experience

Relationship between Co-creation Experience and SST Loyalty & Satisfaction

The link between co-creation and customer loyalty has been understudied in the past. Nonetheless, some studies have indicated a positive correlation between customer loyalty and co-creation behavior. For instance, Cossío-Silva et al. (2016) discovered that customer co-creation behavior enhances customer loyalty in personal care services firms. Similarly, prior research has suggested that there exists a positive correlation between customer co-creation and loyalty. In the context of brand communities, Kaufmann, Loureiro, & Manarioti (2016) argued that customer loyalty towards the brand increases when customers actively participate in co-creation. Additionally, Hajli et al. (2017) established that co-creation in online brand communities can promote trust in the brand, leading to greater customer loyalty. Similarly, in the banking industry, Hosseini & Hosseini (2013) and Nysveen & Pedersen (2014) found that involving customers in co-creation positively affects their loyalty to the bank. Pena et al. (2014) found that co-creation of travel services with customers has a positive effect on customer loyalty in the tourism sector. Similarly, Banyte & Dovaliene (2014) found that patients' participation in co-creation enhances their loyalty to the clinic in the healthcare services sector.

Customer satisfaction is the extent to which customers perceive a service to be emotionally satisfying (Rust & Oliver, 1993). According to Bolton and Lemon (1999) and Oliver (1999), customer satisfaction is a crucial factor in retaining customers and increasing their loyalty, which is important for the long-term profitability and market value of hospitality businesses (Wu & Liang, 2009). Customer loyalty (CL) refers to the extent to which customers are committed to regularly using a particular product or service in the future (Oliver, 1999), and is often measured by repeat patronage, which is a reliable indicator of brand or business loyalty (Heskett et al., 1994).

Above arguments lead to the following hypotheses:

H2: Co-creation experience have a significant relationship with SST loyalty

H3: Co-creation experience have a significant relationship with SST satisfaction

Mediating Role of Co-creation Experience

The central premise of S-D Logic is that service is not a commodity to be exchanged, but rather a reciprocal process that involves the use of knowledge, skills, and competences for the benefit of all parties involved. This perspective considers all firms, markets, economies, and societies as being inherently service-based. In this context, co-creation is a fundamental aspect of businesses that offer services, where the quantity, quality, and attributes of the service are shaped through service encounters (Bitner, Brown, & Meuter, 2000; Solomon et al., 1985).

The customer involved in value co-creation expect the ranges of benefits including hedonic benefits which is informed by pleasurable experiences or intrinsic playful tasks. The customers also anticipate cognitive benefits which corresponds to the knowledge related to the technologies, services and products. It also includes the opportunities to develop skills and come across with new ideas and the benefits in order to meet personal needs (Füller, 2006a, 2010a; Jaakkola, Helkkula, Aarikka-Stenroos, et al., 2015; Nambisan & Baron, 2009).

Lusch and Vargo (2006) proclaimed that customer is always a co-creator of value and the customer's participation always involve value co-creation activities. The implied process is between firm and customer where customer experience enhancement and satisfaction is ultimate goal (Grisseemann & Stokburger-Sauer, 2012). This S-D logic is built around the concept that service is major component of value creation process where customers are actively engaged in each and every phase of value creation. The co-creation lies in to the crux of S-D logic and could be defined as the joint production of value form both customers and firms by the means of an interactive process. Foroudi et al., (2019) in their study found that technological interface i.e., SSTs play critical role in generating citizenship behavior and firm's image through pivotal role of customer co-creation behavior.

On the basis of above arguments, authors formulate the following hypotheses:

H4: Co-creation experience mediates the relationship between SST User Characteristics and SST Loyalty

H5: Co-creation experience mediates the relationship between SST User Characteristics and SST Satisfaction

Theoretical Framework

Based on the hypotheses developed above, the theoretical framework is given in Figure 1.

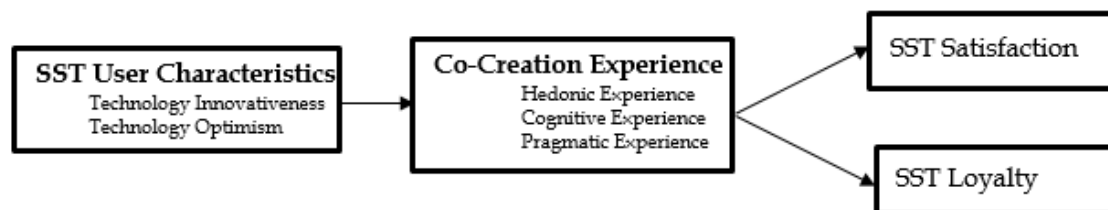


Figure 1: Theoretical Framework

Material and Methods

The sample of the study consisted of users of internet banking applications. A structured survey questionnaire is designed to collect data. Questionnaire of technology optimism and technology innovativeness is adopted from Parasuraman and Colby (2015), questionnaire of Hedonic Experience is adopted from Ryan and Connell, (1989), Questionnaire of Cognitive Experience is adopted from Füller, (2006, 2010), Questionnaire of Pragmatic Experience is adopted from (Chan et al., 2010), Questionnaire of SST Satisfaction is adopted from (Fornell et al., 1996) and Questionnaire of SST Loyalty is adopted from (Cronin, Brady, & Hult's 2000). All questions are asked on 5-point likert scale (1 for strongly disagree to 5 for strongly agree).

The total of 449 responses are received from the respondents. After cleaning of the data, a sample of 410 responses was selected to work upon for the testing of hypotheses. The Partial Least Squares Structural Equation Modeling (PLS-SEM) technique is employed to analyze the data via SmartPLS 3.3.9.

Results and Discussion

The structural model was analyzed using Smart PLS 3.3.9. (Ringle, Sarstedt, & Straub, 2012). The suggested relationships between the latent variables were investigated using PLS-SEM. PLS-SEM analysis should be done in two steps, according to Hair et al. (2011). The first is the estimation of the outside measurement model, followed by the estimation of the inner structural model.

To measure the indicator reliability, the indicator factor loading are used. Composite reliability measures the internal reliability while the average variance explained (AVE) values are used to measure the convergent validity (Hair et al., 2011).

The factor loadings are used to assess the indicator's validity (Hair et al., 2011). Table 1 presents the factor loadings which are as per the defined criteria of Hair et al., (2011). Composite reliability (CR) is used to assess internal reliability of a construct (Hair et al., 2014). The composite reliability estimation aims to determine the effectiveness with which a latent variable is assessed by its associated factors. CR of all constructs is also given in Table 1 which is greater than 0.70. the values of Cronbach's alpha (α) are also greater than 0.70 which indicate the internal reliability of the constructs.

More specifically, the values of Cronbach's alpha (α) of technology innovativeness, technology optimism, cognitive experience, hedonic experience, pragmatic experience, SST satisfaction, SST loyalty are 0.729, 0.853, 0.896, 0.811, 0.787, 0.769, and 0.899 respectively. Likewise, the values of composite reliability of technology innovativeness, technology optimism, cognitive experience, hedonic experience, pragmatic experience, SST satisfaction, SST loyalty are 0.746, 0.859, 0.898, 0.827, 0.799, and 0.769 respectively. The values of AVE of technology innovativeness, technology optimism, cognitive experience, hedonic experience, pragmatic experience, SST satisfaction, SST loyalty are 0.551, 0.694, 0.657, 0.726, and 0.611 respectively (see table 1).

Further, VIF value represent the multicollinearity issue. VIF value less than 3.3 (Diamantopoulos & Siguaw, 2006) shows that there is no issue of multicollinearity which is the case of this study. The R square focuses on the in-sample predictive power. The R square of Cognitive Experience, Hedonic Experience, Pragmatic Experience, SST Loyalty, and SST Satisfaction is 0.251, 0.402, 0.220, 0.523, and 0.477 respectively. Further, the value of standardized root mean square residual (SRMR) is less than 0.08 showing the model fitness.

Table 1
Factor Loadings, Reliability and validity of constructs

Construct	Items	Loadings	Cronbach's Alpha (α)	CR	AVE
Technology Innovativeness	INN1	0.715	0.729	0.746	0.551
	INN2	0.744			
	INN3	0.702			
	INN4	0.805			
Technology Optimis	OPT1	0.821	0.853	0.859	0.694
	OPT2	0.851			
	OPT3	0.813			
	OPT4	0.846			
Cognitive Experienc	CCE1	0.799	0.896	0.898	0.657
	CCE2	0.798			
	CCE3	0.784			
	CCE4	0.852			
	CCE5	0.808			

	CCE6	0.820			
	CHE1	0.851			
Hedonic Experience	CHE2	0.803	0.811	0.827	0.726
	CHE3	0.899			
	CPE1	0.830			
Pragmatic Experience	CPE2	0.793	0.787	0.799	0.611
	CPE3	0.800			
	CPE4	0.698			
	SAT1	0.807			
SST Satisfaction	SAT2	0.830	0.769	0.769	0.684
	SAT3	0.844			
	LOY1	0.813			
	LOY2	0.866			
SST Loyalty	LOY3	0.859	0.899	0.900	0.713
	LOY4	0.844			
	LOY5	0.839			

Note. CR=Composite Reliability, AVE=Average Variance Extracted, α =Cronbach's Alpha

Table 2 presents the path coefficients, and its significance, results show that the technology Innovativeness has positive significant relationship with Cognitive Experience ($\beta=0.300$, $p=0.000$), with Hedonic Experience ($\beta=0.338$, $p=0.000$), and with pragmatic Experience ($\beta=0.381$, $p=0.000$). Results also show the positive relationship of technology optimism with Cognitive Experience ($\beta=0.265$, $p=0.000$), with Hedonic Experience ($\beta=0.376$, $p=0.000$), and with pragmatic Experience ($\beta=0.133$, $p=0.000$).

On the other hand, Cognitive Experience also have positive and significant relationship with SST Loyalty ($\beta=0.194$, $p=0.008$) and SST satisfaction ($\beta=0.287$, $p=0.000$). Further, hedonic Experience also have positive and significant relationship with SST Loyalty ($\beta=0.363$, $p=0.000$) and SST satisfaction ($\beta=0.172$, $p=0.010$). In addition, pragmatic Experience also have positive and significant relationship with SST Loyalty ($\beta=0.157$, $p=0.035$) and SST satisfaction ($\beta=0.069$, $p=0.000$).

Table 2
Path Coefficients and its Significance

Relationships	β	SD	t-stat.	p-values	VIF
TI -> CE	0.300	0.059	5.057	0.000	1.490
TI -> HE	0.338	0.048	7.061	0.000	1.490
TI -> PE	0.381	0.063	6.025	0.000	1.490
TO -> CE	0.265	0.052	5.061	0.000	1.490
TO -> HE	0.376	0.044	8.608	0.000	1.490
TO -> PE	0.133	0.052	2.574	0.010	1.490
CE -> SST Loyalty	0.194	0.073	2.654	0.008	1.998
CE -> SST Satisfaction	0.287	0.070	4.110	0.000	1.998
HE -> SST Loyalty	0.363	0.066	5.520	0.000	1.971
HE -> SST Satisfaction	0.172	0.067	2.583	0.010	1.971
PE -> SST Loyalty	0.157	0.074	2.111	0.035	1.811
PE -> SST Satisfaction	0.254	0.069	3.659	0.000	1.811

Note. TI=Technology Innovativeness, TO=Technology Optimism, CE=Cognitive Experience, HE= Hedonic Experience, PE= Pragmatic Experience, SD=Standard Deviation

The mediation analysis (see table 3) reveals that technology innovativeness has an indirect significant effect on SST Satisfaction via cognitive experience, hedonic experience and pragmatic experience ($\beta=0.086$, $p=0.001$; $\beta=0.058$, $p=0.022$; and $\beta=0.097$, $p=0.001$ respectively). Since the direct effect of TI on satisfaction is 0.014 which is insignificant, thus the relationship between technology innovativeness and SST Satisfaction is fully mediated by Cognitive Experience, Hedonic Experience and Pragmatic Experience (Hair et al. 2022). The total indirect effect of technology innovativeness on SST loyalty via cognitive experience, hedonic experience and pragmatic experience is significant ($\beta=0.058$, $p=0.008$; $\beta=0.123$, $p=0.000$; and $\beta=0.060$, $p=0.030$ respectively). Since the direct effect of technology innovativeness on SST Loyalty is insignificant, thus the relationship between technology innovativeness and SST Loyalty is fully mediated by Cognitive Experience, Hedonic Experience and Pragmatic Experience.

Table 3
Mediation Results (Specific Indirect Effects)

Relationship	β	P values
Technology Innovativeness -> Hedonic Experience -> SST Loyalty	0.123	0.000
Technology Optimism -> Hedonic Experience -> SST Loyalty	0.136	0.000
Technology Innovativeness -> Hedonic Experience -> SST Satisfaction	0.058	0.022
Technology Innovativeness -> Pragmatic Experience -> SST Loyalty	0.060	0.030
Technology Optimism -> Hedonic Experience -> SST Satisfaction	0.065	0.012
Technology Optimism -> Pragmatic Experience -> SST Satisfaction	0.034	0.027
Technology Optimism -> Pragmatic Experience -> SST Loyalty	0.021	0.115
Technology Innovativeness -> Cognitive Experience -> SST Satisfaction	0.086	0.001
Technology Optimism -> Cognitive Experience -> SST Satisfaction	0.076	0.001
Technology Optimism -> Cognitive Experience -> SST Loyalty	0.052	0.016
Technology Innovativeness -> Pragmatic Experience -> SST Satisfaction	0.097	0.001
Technology Innovativeness -> Cognitive Experience -> SST Loyalty	0.058	0.008

On the other side, there is partial mediation between Technology optimism and SST satisfaction via cognitive experience, hedonic experience and pragmatic experience. As the indirect effects between technology optimism and SST satisfaction via cognitive experience, hedonic experience and pragmatic experience are significant ($\beta=0.086$, $p=0.001$; $\beta=0.076$, $p=0.001$; and $\beta=0.034$, $p=0.027$ respectively). Since the direct effect of technology Optimism on SST Satisfaction is also significant ($\beta=0.130$, $p=0.015$). The direct effect of technology Optimism on SST loyalty is also significant ($\beta=0.230$, $p=0.000$) while the indirect effects via cognitive experience, hedonic experience are significant ($\beta=0.052$, $p=0.016$; and $\beta=0.136$, $p=0.000$ respectively) and via pragmatic experience is insignificant ($\beta=0.021$, $p=0.115$). Thus, cognitive experience, hedonic experience partially mediates the relationship between technology optimism and SST Loyalty, and pragmatic experience does not mediate the relationship.

Conclusion

Study found that SST user characteristics have a positive relationship with co-creation experience. These results are in accordance with the prior literature (Kim et al., 2019; Kim, Tang, & Bosselman, 2018; Maglio & Spohrer, 2008; Yen et al., 2020). These findings of H1 confirm that there is a positive relationship between the combination of an employee's views of optimism and innovativeness towards technology, and their experience of co-creation. When implementing new technology, it may be beneficial to focus on how it can improve daily functioning and success for consumers in order to fully accept and adopt the technological changes. Results of H1 could be summarized as

consumers/customers who have the higher extent of innovativeness would voluntarily adopt new technology and co-create the value and possess comparatively more experience than others. This means that SST service providers should stimulate more certainly the positive drivers of SST users' characteristics in order to reach the business goals for satisfying customers and increasing benefits.

Findings of H2 & H3 confirms the positive relationship between co-creation experience and SST loyalty and satisfaction. These results are in accordance with the prior literature (Euiyoung Kim et al., 2018; Eojina Kim et al., 2019). Authors can discuss this relationship as positive co-creation experience creates a sense of loyalty and sense of satisfaction to the self-service technologies.

Moreover, the findings of H4 & H5 confirms the mediating role of co-creation experience between SST user characteristics and SST loyalty and satisfaction. These results are in accordance with the prior literature Kim (2016), they tested and found the significant mediating role of co creation behavior between customer innovativeness, and customer satisfaction and customer loyalty. Results are also in accordance with the previous literature (Chen & Chen, 2009; Kang & Gretzel, 2012; Lin & Hsieh, 2007; Parasuraman, 2000; Thong et al., 2006; Wang et al., 2017). These results could be discussed as co-creation experience can act as an intermediate variable that explains how user characteristics (such as technology innovativeness and technology optimism) can influence SST satisfaction. More technology innovative customers are more likely to have a positive co-creation experience while using self-service technology. A positive co-creation experience, in turn, leads to higher level of self-service technology' satisfaction. Similarly, more technology optimistic customers are more likely to have a positive co-creation experience while using a self-service technology. A positive co-creation experience, in turn, leads to higher level of self-service technology' satisfaction.

The present study identifies some limitations which need to get addressed by future researchers. First of all, as all variables are measured via questionnaire only, so there may be common method bias. Which in turn may affect the results' accuracy. Authors direct the future researchers to imply other methods, most probably qualitative methods i.e. interviews to gain the detailed insights of results and avoid the common method bias.

The other limitation is about the data, as the collected data is from Pakistan only. Authors give the directions to future researchers to conduct the study in other countries, or other regions to gain the generalizability of results. Applying same study on respondents from different cultural background may enhance the generalizability of results. Further, author also suggests to incorporate the factors other than the factors already taken in this study to get the more comprehensive overview of self-service technology. These factors may be situational factors as well.

As per the methodological limitations are concerned, this study is cross sectional one. Future researchers are suggested to give longitudinal results. As the behavior aspects of customers get changed very frequently. Longitudinal study incorporates these changings and can provide better results.

Recommendations

This study unveils the empirical relationship between SST user characteristics (technology innovativeness and technology optimism), co-creation experience (cognitive experience, hedonic experience, and pragmatic experience) and SST satisfaction, and SST

loyalty. Results of the study provide the empirical evidence of mediating role of co-creation experience. Self-service technology providers can enhance the customer experience of co-creation by providing them customization, by giving them option to share the feedback. By doing so, customer will participate in value creation, and this will ultimately enhance the customer satisfaction, loyalty and their usage intention regarding SST.

References

- Akaka, M. A., & Vargo, S. L. (2015). Extending the context of service: from encounters to ecosystems. *Journal of Services Marketing*, 29(6/7), 453-462.
- Banyte, J., & Dovaliene, A. (2014). Relations between customer engagement into value creation and customer loyalty. *Procedia-Social and Behavioral Sciences*, 156, 484-489.
- Barnes, J. G., Dunne, P. A., & Glynn, W. J. (2000). Self-service and technology. *Handbook of services marketing and management*, 89-102.
- Bitner, M. J., Brown, S. W., & Meuter, M. L. (2000). Technology infusion in service encounters. *Journal of the Academy of marketing Science*, 28(1), 138-149.
- Bitner, M. J., Faranda, W. T., Hubbert, A. R., & Zeithaml, V. A. (1997). Customer contributions and roles in service delivery. *International Journal of Service Industry Management*.
- Bolton, R. N., & Lemon, K. N. (1999). A dynamic model of customers' usage of services: Usage as an antecedent and consequence of satisfaction. *Journal of marketing research*, 36(2), 171-186.
- Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V. A. (1993). A dynamic process model of service quality: from expectations to behavioral intentions. *Journal of marketing research*, 30(1), 7-27.
- Buhalis, D., Lin, M. S., & Leung, D. (2022). Metaverse as a driver for customer experience and value co-creation: implications for hospitality and tourism management and marketing. *International Journal of Contemporary Hospitality Management*, 35(2), 701-716.
- Carù, A., & Cova, B. (2003). Revisiting consumption experience: A more humble but complete view of the concept. *Marketing theory*, 3(2), 267-286.
- Chan, K. W., Yim, C. K., & Lam, S. S. (2010). Is customer participation in value creation a double-edged sword? Evidence from professional financial services across cultures. *Journal of marketing*, 74(3), 48-64.
- Chen, H.-H., & Chen, S.-C. (2009). The empirical study of automotive telematics acceptance in Taiwan: Comparing three technology acceptance models. *International Journal of Mobile Communications*, 7(1), 50-65.
- Chen, L.-C., & Tseng, C.-Y. (2013). Managing service innovation with cloud technology. *Global Business Perspectives*, 1(4), 379-390.
- Chen, S. C., Chen, H. H., & Chen, M. F. (2009). Determinants of satisfaction and continuance intention towards self-service technologies. *Industrial Management & Data Systems*.
- Chen, Z., King, B., & Suntikul, W. (2019). Festivalscapes and the visitor experience: An application of the Stimulus Organism Response approach. *International Journal of Tourism Research*, 21(6), 758-771.

- Cossío-Silva, F.-J., Revilla-Camacho, M.-Á., Vega-Vázquez, M., & Palacios-Florencio, B. (2016). Value co-creation and customer loyalty. *Journal of Business Research*, 69(5), 1621-1625.
- Cronin Jr, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of retailing*, 76(2), 193-218.
- Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2001). Atmospheric qualities of online retailing: A conceptual model and implications. *Journal of Business Research*, 54(2), 177-184.
- Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2003). Empirical testing of a model of online store atmospherics and shopper responses. *Psychology & Marketing*, 20(2), 139-150.
- Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American customer satisfaction index: nature, purpose, and findings. *Journal of marketing*, 60(4), 7-18.
- Foroudi, P., Yu, Q., Gupta, S., & Foroudi, M. M. (2019). Enhancing university brand image and reputation through customer value co-creation behaviour. *Technological Forecasting and Social Change*, 138, 218-227.
- Füller, J. (2006). Why Consumers Engage in Virtual New Product Developments Initiated by Producers. *Advances in Consumer research*, 33(1), 639-646.
- Füller, J. (2010). Refining virtual co-creation from a consumer perspective. 52(2), 98-122.
- Grisseemann, U. S., & Stokburger-Sauer, N. E. (2012). Customer co-creation of travel services: The role of company support and customer satisfaction with the co-creation performance. *Tourism management*, 33(6), 1483-1492.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
- Hajli, N., Shanmugam, M., Papagiannidis, S., Zahay, D., & Richard, M.-O. (2017). Branding co-creation with members of online brand communities. *Journal of Business Research*, 70, 136-144.
- Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., & Schlesinger, L. A. (1994). Putting the service-profit chain to work. *Harvard business review*, 72(2), 164-174.
- Hilton, T., Hughes, T., Little, E., & Marandi, E. (2013). Adopting self-service technology to do more with less. *Journal of Services Marketing*.
- Hughes, C. A., Morris, J. R., Therrien, W. J., & Benson, S. K. (2017). Explicit instruction: Historical and contemporary contexts. *Learning Disabilities Research & Practice*, 32(3), 140-148.
- Jaakkola, E., Helkkula, A., Aarikka-Stenroos, L., & Verleye, K. (2015). The co-creation experience from the customer perspective: its measurement and determinants. *Journal of Service Management*.

- Kang, M., & Gretzel, U. (2012). Perceptions of museum podcast tours: Effects of consumer innovativeness, Internet familiarity and podcasting affinity on performance expectancies. *Tourism Management Perspectives*, 4, 155-163.
- Katsikeas, C., Leonidou, L., & Zeriti, A. (2020). Revisiting international marketing strategy in a digital era: Opportunities, challenges, and research directions. *International Marketing Review*, 37(3), 405-424.
- Kim, E., Beckman, S. L., & Agogino, A. (2018). Design roadmapping in an uncertain world: implementing a customer-experience-focused strategy. *California management review*, 61(1), 43-70.
- Kim, E., Tang, L. R., & Bosselman, R. (2018). Measuring customer perceptions of restaurant innovativeness: Developing and validating a scale. *International Journal of Hospitality Management*, 74, 85-98.
- Kim, E., Tang, L., & Bosselman, R. (2019). Customer perceptions of innovativeness: An accelerator for value co-creation. *Journal of Hospitality & Tourism Research*, 43(6), 807-838.
- Kim, J. (2016). An extended technology acceptance model in behavioral intention toward hotel tablet apps with moderating effects of gender and age. *International Journal of Contemporary Hospitality Management*, 28(8), 1535-1553.
- Lee, H.-J. (2015). Consumer-to-store employee and consumer-to-self-service technology (SST) interactions in a retail setting. *International Journal of Retail & Distribution Management*.
- Leong, A. M. W., Yeh, S. S., Zhou, Y., Hung, C. W., & Huan, T. C. (2024). Exploring the influence of historical storytelling on cultural heritage tourists' value co-creation using tour guide interaction and authentic place as mediators. *Tourism Management Perspectives*, 50, 101198.
- Liljander, V., Gillberg, F., Gummerus, J., & Van Riel, A. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, 13(3), 177-191.
- Lin, J.-S. C., & Hsieh, P.-L. (2007). The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computers in Human Behavior*, 23(3), 1597-1615.
- Lusch, R. F., & Vargo, S. L. (2006). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory*, 6(3), 281-288.
- Maglio, P. P., & Spohrer, J. (2008). Fundamentals of service science. *Journal of the Academy of marketing Science*, 36(1), 18-20.
- Makanyeza, C., & Chikazhe, L. (2017). Mediators of the relationship between service quality and customer loyalty: Evidence from the banking sector in Zimbabwe. *International Journal of Bank Marketing*.
- Meuter, M. L., & Bitner, M. J. (1998). Self-service technologies: extending service frameworks and identifying issues for research. Paper presented at the *American marketing association. Conference proceedings*.

- Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of marketing*, 69(2), 61-83.
- Mollen, A., & Wilson, H. (2010). Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives. *Journal of Business Research*, 63(9-10), 919-925.
- Nambisan, S., & Baron, R. A. (2009). Virtual customer environments: testing a model of voluntary participation in value co-creation activities. *Journal of product innovation management*, 26(4), 388-406.
- Nof, S. Y., Ceroni, J., Jeong, W., & Moghaddam, M. (2015). Revolutionizing Collaboration through e-Work, e-Business, and e-Service, *Springer*, (2).
- Nuseir, M. T., El Refae, G. A., Aljumah, A., Alshurideh, M., Urabi, S., & Kurdi, B. A. (2023). Digital Marketing Strategies and the Impact on Customer Experience: A Systematic Review. The Effect of Information Technology on Business and Marketing Intelligence Systems, 21-44.
- Oliver, R. L. (1999). Whence consumer loyalty? *Journal of marketing*, 63(4), 33-44.
- Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of service research*, 2(4), 307-320.
- Parasuraman, A., & Colby, C. L. (2015). An updated and streamlined technology readiness index: TRI 2.0. *Journal of service research*, 18(1), 59-74.
- Payne, A., Storbacka, K., Frow, P., & Knox, S. (2009). Co-creating brands: Diagnosing and designing the relationship experience. *Journal of Business Research*, 62(3), 379-389.
- Pine, B. J., & Gilmore, J. H. (1999). The experience economy: work is theatre & every business a stage: *Harvard Business Press*.
- Polo Pena, A. I., Frias Jamilena, D. M., & Rodríguez Molina, M. Á. (2014). Value co-creation via information and communications technology. *The Service Industries Journal*, 34(13), 1043-1059.
- Prahalad, C. K., & Krishnan, M. (2008). The new age of innovation: *McGraw-Hill Professional Publishing New York*.
- Prahalad, C. K., & Ramaswamy, V. (2003). The new frontier of experience innovation. *MIT Sloan management review*, 44(4).
- Prahalad, C. K., & Ramaswamy, V. (2004a). Co-creation experiences: The next practice in value creation. *Journal of interactive marketing*, 18(3), 5-14.
- Quinn, J. B., Doorley, T. L., & Paquette, P. C. (1990). Beyond products: Services-based strategy. *Harvard business review*, 68(2), 58-60, 64.
- Rajaguru, R. (2014). Motion picture-induced visual, vocal and celebrity effects on tourism motivation: Stimulus organism response model. *Asia Pacific Journal of Tourism Research*, 19(4), 375-388.

- Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). Editor's comments: a critical look at the use of PLS-SEM in "MIS Quarterly". *MIS quarterly*, iii-xiv.
- Romero, D., & Molina, A. (2009). Value co-creation and co-innovation: Linking networked organisations and customer communities. Paper presented at the *Working Conference on Virtual Enterprises*.
- Rust, R. T., & Oliver, R. L. (Eds.). (1993). *Service quality: New directions in theory and practice*. Sage Publications.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of personality and social psychology*, 57(5), 749.
- Sheth, J. N., Jain, V., & Ambika, A. (2023). The growing importance of customer-centric support services for improving customer experience. *Journal of Business Research*, 164.
- Solakis, K., Pena-Vinces, J., & Lopez-Bonilla, J. M. (2022). Value co-creation and perceived value: A customer perspective in the hospitality context. *European research on management and business economics*, 28(1).
- Solomon, M. R., Surprenant, C., Czepiel, J. A., & Gutman, E. G. (1985). A role theory perspective on dyadic interactions: the service encounter. *Journal of marketing*, 49(1), 99-111.
- Thong, J. Y., Hong, S.-J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International journal of human-computer studies*, 64(9), 799-810.
- Vargo, S. L., & Lusch, R. F. (2004). The four service marketing myths: remnants of a goods-based, manufacturing model. *Journal of service research*, 6(4), 324-335.
- Vargo, S. L., & Lusch, R. F. (2008a). From goods to service (s): Divergences and convergences of logics. *Industrial Marketing Management*, 37(3), 254-259.
- Vargo, S. L., & Lusch, R. F. (2008b). Service-dominant logic: continuing the evolution. *Journal of the Academy of marketing Science*, 36(1), 1-10.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European management journal*, 26(3), 145-152.
- Vasil M, M., Chopdar, P. K., Buhalis, D., & Das, S. S. (2024). Value co-creation in the sharing economy: Revisiting the past to inform future. *Psychology & Marketing*.
- Verhoef, P. C., Lemon, K. N., Parasuraman, A., Roggeveen, A., Tsiros, M., & Schlesinger, L. A. (2009). Customer experience creation: Determinants, dynamics and management strategies. *Journal of retailing*, 85(1), 31-41.
- Vize, R., Coughlan, J., Kennedy, A., & Ellis-Chadwick, F. (2013). Technology readiness in a B2B online retail context: An examination of antecedents and outcomes. *Industrial Marketing Management*, 42(6), 909-918.

- Walczuch, R., Lemmink, J., & Streukens, S. (2007). The effect of service employees' technology readiness on technology acceptance. *Information & management*, 44(2), 206-215.
- Wang, C. (2017). Consumer acceptance of self-service technologies: an ability-willingness model. *International Journal of Market Research*, 59(6), 787-802.
- Wu, C. H. J., & Liang, R. D. (2009). Effect of experiential value on customer satisfaction with service encounters in luxury-hotel restaurants. *International Journal of Hospitality Management*, 28(4), 586-593.
- Yen, C.-H., Teng, H.-Y., & Tzeng, J.-C. (2020). Innovativeness and customer value co-creation behaviors: Mediating role of customer engagement. *International Journal of Hospitality Management*, 88, 102514.
- Zhang, Y., Liang, C., & Li, X. (2024). Understanding virtual agents' service quality in the context of customer service: A fit-viability perspective. *Electronic Commerce Research and Applications*, (65), 101380.