Impact of Self-Service Factors on Customer Value: How Customer Behavioral Intentions are Formed?

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Service quality has been a topic of extensive inquiry for decades that has emerged in form of self-service which has profound effects on the way customers interact with firms to create positive service outcomes i.e., customer convenience, security, and behavioral intentions. This study focuses on investigating the factors that affect the consumer's intention to use self-service. This study also examines the mediating roles of customer value for the aforementioned relationships. An empirical survey research design was used to collect data from 350 customers using self-service in Taiwan. The data were analyzed using structural equation modeling approach to test the proposed hypotheses. The results showed the convenience, economy, security, and reduced complexity factors are significantly related to customer value of self-service, despite of their different contribution. The study found mediating effect of customer value on the relationship between influencing context factors and behavioral intentions. These results provide insights for the service sector of the Taiwan to invest in self-service in order to enhance the consumer repurchase Intentions.

Keywords: Service quality, self-service, behavioral intentions, customer value, Taiwan

JEL: L84, M31

The service industry, particularly the self−service, is considered as more important for service innovation while economy continues to develop. With information, communication and advances in network technology, the service model of the traditional service industry must be changed into three aspects: scientific, technological progress, and competitive environment to create business value by consumer expectation (Trivedi *et al.*, 2018). Due to the advancement of service and information technologies, self−service services are not only divided in various categories, but also integrated into people's daily life and work today. It is imperative for service industry practitioners to exactly understand the factors determining the self−service model to strengthen their competitive advantage. More self−service styles are applied in human living and work resulted due to the advancement of service and information technologies (Bailey *et al.*, 2017; Chiu *et al.*, 2017). For example, online banking transfers, placing orders, purchasing funds, automated teller machine (ATM) funds deposit and withdrawal (Mukerjee, 2020; Kimes and Collier, 2015), expressway electronic toll collection (ETC), public and private parking lot by automatic payment machines, MRT stations' automated ticketing machines, self−service gas stations, price checking machines in mass merchandise stores and super-

markets, etc.

The technology acceptance model (TAM) suggests that self-service usage is driven by perceived usefulness and perceived ease of use (Bailey *et al.*, 2017; Abdullah and Ward, 2016; Davis, 1989). Studies have shown that perceived usefulness and perceived ease of use influence the behavioral intentions of customers (Dwivedi *et al.*, 2019). For instance, Meuter *et al.* (2000) believe that whether consumers decide to try self-service depends on their readiness, including ability, role clarity and motivation. Dabholkar and Bagozzi (2002) used the general attitude towards the use of technology based on self-service as the intermediary variable. Meuter *et al.* (2003) used consumer readiness as an intermediary variable. However, few studies have explored customer value as a key intermediary variable to explore customer acceptance or purchase intentions and its influencing factors in a self-service context is the only exception (Chen *et al.*, 2018; Collier and Sherrell, 2010).

Self-service have made service delivery for customers cost-effective, convenient, and ubiquitous (Wirtz and Zeithaml, 2018). In modern marketing concepts, especially from the viewpoints of relationship marketing and performance marketing, customer value is regarded as a key influencing factor of customer loyalty (Trivedi *et al.*, 2018). Therefore, it is worthy to explore the mediating role of customer value. Literature shows that previous research mostly focused on the factors of self-service "technology" itself, such as ease of use and usefulness (Davis, 1989), innovative features (Meuter *et al.*, 2000), speed and reliability (Shamdasani *et al.*, 2008), convenience (Collier and Sherrell, 2010; Globerson and Maggard, 1991). In addition, few dealing with the adoption buying-decisions process of self-service explored consumer or user level factors (Chen *et al.*, 2018; Chen and Wang, 2016; Dabholkar and Bagozzi, 2002). Consequently, the behavioral intentions of customers' need further research (Giebelhausen *et al.*, 2014; Robertson *et al.*, 2016).

The mandatory use of self-service by some service providers and the enhanced e-service quality have led to loyalty among self-service users (Reinders *et al.*, 2015; Theodosiou *et al.*, 2019). Businesses require technological development to enhance service value and profit, with an even more competitive service pattern of innovation for delivery and creating higher customer value. The accelerating growth in technology-based self-service that is giving the acceptance of such forms of service delivery by all kinds of consumers and under different situational contexts (Dabholkar *et al.*, 2002). In view of above background development, the purpose of this research is to examine the influence of self-service on customer behavioral intentions. This study also attempts to examine the mediating roles of customer value for the aforementioned relationships.

LITERATURE REVIEW

Theoretical Underpinnings

Resource matching theory (RMT) is used to explain how to optimize the user's cognitive resources to complete tasks (Anand and Sternthal, 1990). This theory assumes that consumer's cognitive resources are limited. When the user's mental elaboration of cognitive resources and tasks are matched, we can have the best results. More or less, user's cognitive resources than the required task, the user's decision performance will be affected. Research showed that using the self-service can bring many benefits (Meuter *et al.*, 2003), for example, effective processing to complete transactions, convenience, ease of use, and saving time (Alreck and Settle, 2002; Bateson, 1985; Berry *et al.*, 2002). The potential benefits from utilizing a self-service have encouraged providers to remove contact with customers to technology-based encounters in order to increase efficiency and add consistency to service delivery (Dabholkar, 1996). TAM suggests that the attitude, intention to use service and actual use of a technology-based system are based on the perceived usefulness and perceived ease of use (Davis, 1989; Wu and Chen, 2017). Perceived usefulness has been defined as "the degree to which a person believes that using a particular system would enhance his or her job performance", while perceived ease of use has been defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). TAM is focused more on technology, and is claimed to be different from previous measurements as it provides a valid measurement scale to predict user acceptance of information technology (IT).

Empirical Review

Early studies on self-service showed that the enhanced service quality and lesser costs resulted in the rapid adoption of self-service by customers of various services like banking (Mukerjee, 2020; Dabholkar, 1996). The customers' readiness to adopt self-service, coupled with the growing penetration of internet-enabled mobile devices, like smartphones, has prompted many service providers to make self-service usage mandatory for customers (Yang and Lee, 2016; Reinders *et al.*, 2015). While a lot of the literature on self-service is focused on adoption and attitude towards self-service technology, there is a lack of research pertaining to the consequences of self-service usage, which is an important line of enquiry (Robertson *et al.*, 2016). Studies on the consequences of self-service usage have focused on service quality (Jun and Palacios, 2016), customer relationship and loyalty (Nijssen *et al.*, 2016), customer satisfaction and trust (Robertson *et al.*, 2016), brand engagement (Khan *et al.*, 2016), and service failure and recovery (Collier *et al.*, 2017). Other studies have mentioned that customers feel more empowered and show increased participation (Djelassi *et al.*, 2018). Customers share their opinions and recommendations based on self-service usage, and these are taken seriously by others (Singh *et al.*, 2020). With respect to self-service, perceived useful-

ness and perceived ease of use shape the behavioral intentions of customers (Bailey *et al.*, 2017; Dwivedi *et al.*, 2019).

Self-service has a significant impact on the efficiency of the overall quality and value and loyalty intentions (Dwivedi *et al.*, 2019; Parasuraman *et al.*, 2005). Changes in customer attitude and behavior are more important marketing objective that reflect basic psychological influences and have been a subject of intensive research for decades (Djelassi *et al.*, 2018). Through experience and learning, people acquire beliefs and attitudes (Dwivedi *et al.*, 2019). People believe that attributes and benefits of the product or brand influence their buying decision (Singh *et al.*, 2020). An attitude is a person' enduring favorable or unfavorable evaluation, emotional feeling, and action tendencies toward some object or idea (Kotler and Keller, 2012). Behavioral intentions include loyalty, tendency to switch, willingness to pay more, external responses and internal responses (Wu and Chen, 2017). The focus of this study is similar to the loyalty behavior perspectives, including recommendations to others or praising self-service; intent to purchase is assumed to be higher according to the customer value of the self-service, leading to more positive behavioral intentions.

Convenience: Self-services offered by service providers have made it easy and convenient for customers to search and buy more products (Kumar and Kashyap, 2018). The role of perceived usefulness and perceived ease of use has been to offer enhanced convenience to customers and improve the self-efficacy with respect to the use of self-service (Ozturk *et al.*, 2016). The convenience of a service refers to the time and effort required by customers to purchase or use the service (Alreck and Settle, 2002; Bateson, 1985; Berry *et al.*, 2002). Furthermore, Brown (1989) believed that convenience includes five dimensions: time, place, acquisition, use, and execution. The time and place dimensions refer to the service provided is convenient for customers (Djelassi *et al.*, 2018). The acquisition dimension refers to the financial or other channels provided by the enterprise to facilitate customers to purchase their services. The use dimension refers to the service that makes customers feel comfortable to use the degree of convenience. The execution dimension refers to the convenience of choosing to do it by yourself or by others. Berry *et al.* (2002) believed that any convenience that can reduce customer shopping time and energy can be regarded as the category of service convenience. In the consumer process, time of use is often regarded as an investment. The convenience of self-services can provide more classes to customers to reduce customer worries and business costs effectively (Conningham *et al.*, 2008), then it can be higher customer value. According to resource matching theory, customer should allocate matching cognitive resource to the task, if the self-service is too hard for customer to access, the task will need more cognitive resource (Anand and Sternthal, 1990). On the basis of the aforementioned arguments, the following hypothesis is proposed:

H_1: Convenience provided by self-service will positively influence customer value.

Economy: Economy refers to the degree of customers' consumption behavior that can save money (Lovelock and Young, 1979). Price discounts or promotions that can increase customer economic value and therefore increase customers' purchases (Chen *et al.*, 2018; Bonini and Rumiate, 2002). Zeithaml *et al.* (2009) think customers must give up or sacrifice when they obtain a certain product or service. Conningham *et al.* (2008) believed that money saving is one of the main factors for customers to use self-service. Service providers often use financial links such as promotion and price reduction to improve the economics of customers' purchases (Chen and Wang, 2016), which in turn positively affect customers' perception of value (Bailey *et al.*, 2017; Chiu *et al.*, 2005). Past studies have shown that customers do not always remember the actual price of a product or service, so they usually encode the actual price in a way that is more meaningful to them and convert it into the concept of "expensive" or "cheap". The price method can facilitate memory and accelerate value judgment. Self-service can usually save the cost of personnel service and provide a lower price than the personnel service model (Chen *et al*, 2018; Chen and Wang, 2016), so it can improve customer value. On the basis of the aforementioned arguments, the following hypothesis is proposed:

H_2: Economy provided by self-service will positively influence customer value.

Security: Security means that when customers purchase products or services, they pay special attention to the security of the transaction environment to ensure their own rights and interests (Estrella-Ramon, 2017). If customers purchase products or services through the internet, they often use credit card transactions, which may involve the unauthorized acquisition and disclosure of personal data or the risk of personal data being hacked (Mukerjee, 2020). Szymanski and Hise (2000) showed the cognitive risk of the purchase situation has a great influence on customers' shopping decision. The provision of online transaction security has a significant positive impact on customers' value perception (Mukerjee, 2020; Szymanski and Hise, 2000). Customers often prioritize product safety-related information provided by a company (Hurley and Ragothaman, 2002). The security of trading venues and transactions themselves is very important for customers (Dabholkar, 1996). Self-service methods require customers to operate equipment or engage in self-service by themselves (Mukerjee, 2020; Estrella-Ramon, 2017). Because customer needs secure environment to make transections, we propose that secure personnel service model can improve the customer value. On the basis of the aforementioned arguments, the following hypothesis is proposed:

H_3: Security provided by self-service will positively influence customer value.

Reduced Complexity: Kotler and Keller (2012) believed that complexity refers to the relative difficulty of using or understanding a new product. As long as the complexity of the new product is lower than original product, customers will be more inclined to accept the new product. Conversely, higher the complexity of innovative products, less likely it is to be adopted by customers. In a self-service study based on TAM, it was found that ease of use (low complexity) and fun are very important variables (Wu and Chen, 2017). When customers are crowded and may have to wait for a long time, enterprises should emphasize that using self-service is "easy to use" and "pleasant" (Dabholkar and Bagozzi, 2002). In another study on customer trials of self-service, people also listed "complexity" as a pre-variable for innovation adoption (Meuter *et al.*, 2003). When the new self-service provided by enterprise is difficult to operate and understand, customers' willingness to use it will be reduced (Meuter *et al.*, 2003). Shamdasani *et al.* (2008) also listed work complexity as one of the influencing factors for customers to use self-service. Self-service usually saves the time of personnel service and provides a lower price as compared to the personnel service (Chen *et al*, 2018; Chen and Wang, 2016). Consequently, we propose that the reduced complexity of self-service can improve customer value. On the basis of the aforementioned arguments, the following hypothesis is proposed:

H_4: Reduced complexity provided by self-service will positively influence customer value.

Customer Value: Value includes four dimensions: acquisition, transaction, in-use, and redemption (Parasuraman and Grewal, 2000). Customer value is considered central to acquiring competitive advantage and to the long-term success of a company (Trivedi *et al.*, 2018; Ma *et al.*, 2010). Customer value has become one of the key sources of competitive advantage or success (Nasution *et al.*, 2011; Parasuraman, 1997; Woodruff, 1997). Customer value is a subjective perception constituted by multiple factors, including quality, emotional response, monetary price, behavioral price, and prestige (Petrick, 2002). Total customer value is the monetary value of the bundle of economic, functional, and psychological benefits customers expect from a given market offering. Total customer cost is the bundle of costs customers expect to incur in evaluating, obtaining, using, and disposing of the given market offering, including monetary, time, energy, and psychic costs (Kotler and Keller, 2012). Heinonen (2004) found that time and location are even more important dimensions than outcome and process elements. The theory of customer value is becoming increasingly used in management strategy formulation as well as marketing literature in recent years (Trivedi *et al.*, 2018). The construct of perceived value has been identified as one of the most important measures for gaining competitive edge (Parasuraman, 1997), and has been argued to be the most important indicator of behavioral intentions (Parasuraman and Grewal, 2000). Zeithaml *et al.* (2009) defined

customer value as the overall assessment of the utility of merchandises based on perceptions of what is received and what is given. Customer value in an online or a self-service context directly relates to benefits that are derived from using the self-service (Mukerjee, 2020). On the basis of the aforementioned arguments, the following hypothesis is proposed:

H_5: Customer value provided by self-service will positively influence behavioral intentions.

Changes to the product/service cycle means that the value of a dynamic concept will change over time. Customer value is a subjective perception constituted by multiple factors (Petrick, 2002). Heinonen (2004) found that time and location are perceived as important value dimensions. Numerous researchers have identified value as one of the critical factors in a customer's decision-making process (Baker *et al.*, 2002; Parasuraman and Grewal, 2000; Grewal *et al.*, 1998). Further, we propose the mediator effects offered by customer value between the relationship of self-service and behavioral intentions, the following hypotheses are proposed:

H_6: Customer value will positively mediate the relationship between convenience and behavioral intentions.

H_7: Customer value will positively mediate the relationship between economy and behavioral intentions.

H_8: Customer value will positively mediate the relationship between security and behavioral intentions.

H_9: Customer value will positively mediate the relationship between reduced complexity and behavioral intentions.
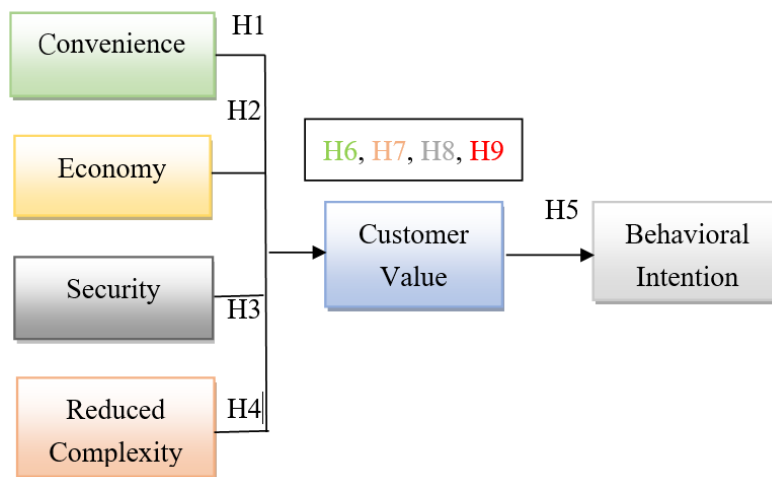
Source: Author's Presentation

Figure 1. Conceptual Framework

The conceptual framework is given in Figure 1 above. Kotler used a stimulus-response model to analyze consumers' behavior when stimulated by marketing (black box) i.e., to examine the impact of marketing efforts on consumers' purchase decisions. A model is proposed that views the stimulus and response set in S- R ensembles as categories with dimensions that may or may not overlap (Kornblum *et al.*, 1990). The model performs a holistic evaluation of the subject matter that affects consumers' behavioral intentions.

METHODOLOGY

-Sample and Data

A self-reported survey research design was adopted to test the hypothesized relationships. The instrument development, the summary of each construct operational definition is given in Table 1 (see Appendix-I). A questionnaire was designed using 24 items, wherein respondents rated each item on a 5-point Likert-type scale. The descriptive statistics were calculated by using SPSS 20.0. 435 questionnaires were administered to customers with self-service experience in Taiwan and a total of 350 (response rate 80.8%) valid responses to the questionnaire were got back. In terms of gender, 60% percent of the respondents were female and 40 percent were male. The biggest group of respondents in terms of age was 40-49 (38.6%). The demographic information about the samples is given in Table 2 (see Appendix-II).

-Measures

The measures for the constructs were adapted from the extant literature and adjusted to capture the context of self-service. The adapted items were shown to a group of marketing experts from the self-service marketing domain to assess the face and content validity. Convenience and behavioral intentions were measured using three-item scale. Economy and customer value were measured with a four-item scale, while security and reduced complexity were measured using five-item scale. These items related to self-service provided an understanding of the customer's behavioral intentions.

-Reliability and Validity

The scale reliability (Cronbach's α) of convenience was 0.67, economy was 0.74, security was 0.83, reduced complexity was 0.73, customer value was 0.60 and behavior intentions was 0.71. All the scales were then subjected to confirmatory factor analysis (CFA) using SPSS 20.0 with maximum likelihood estimation method.

The scales' composite reliability (CR) and average variance extracted (AVE) for the convenience, economy, security, and reduced complexity exceeded the threshold level of 0.50. The loadings and

composite reliability (CR) of each of the construct was greater than 0.60 (Table 3 - Appendix-III). Thus, the constructs meet the convergent and discriminant validity criteria (Voorhees *et al.*, 2016).

-Hypotheses Testing

The data were analyzed using structural equation modelling (SEM). The questionnaire constructed for this study was based on previous research; it was modified for the customer context. Table 3 showed each item's mean, standard deviation, and *t*-statistics. The descriptive statistics and Pearson correlation matrix is shown in Table 4 (see Appendix-IV).

The structural model results show that convenience, economy, security, and reduced complexity positively influences customer value, therefore, hypotheses 1 to 4 are supported. In addition, customer value positively influenced behavioral intentions. This provided support to hypothesis 5. The mediating relationships reported to hypothesis 6 to hypothesis 9 also got support as shown in Table 5 (see Appendix-V).

DISCUSSION AND CONCLUSION

The objective of this study was to test the influence of self-service factors i.e., convenience, economy, security, and reduced complexity on customer value. Previous studies on self-service have shown that it can influence satisfaction (Meuter *et al.*, 2000), service quality (Jun and Palacios, 2016), customer relationship and loyalty (Nijssen *et al.*, 2016), service failure and recovery (Collier *et al.*, 2017) etc. While behavioral intentions among self-service users have been shown as an outcome of mandated use by service providers (Reinders *et al.*, 2015) and e-service quality (Theodosiou *et al.*, 2019). Further, the mediating role of customer value between the relationship of self-service factors (convenience, economy, security and reduced complexity) and customer behavioral intentions has not been studied previously. The current study has made an attempt to offer new empirical evidence on the consequences of self-service factors i.e., convenience, economy, security, and reduced complexity.

The research found that convenience, economy, security, and reduced complexity are positively and significantly related to customer value. These effects show that in the self-service situation, customer value plays an important role in enhancing customers' behavioral intentions. In other words, this study found that the self-service scenario, the convenience, economy, security, and reduced complexity have a direct impact on behavioral intentions and in direct impact via customer value. This study examined the mediator effect of customer value on the relationship between self-service factors and behavioral intentions. The research not only provides insights into the study of self-service and but also will help practitioners identifying self-service influencing factors (and their relative importance).

IMPLICATIONS

The current study has shown that factors influencing self-service i.e., convenience, economy, security, and reduced complexity have a direct impact on customer value and customer behavioral intentions. In addition, customer value partially mediates the aforementioned relationships. Managers can foster convenience through improvements in self-service, with particular focus on enhancing the perceived usefulness and perceived ease of use. The customers' journey while using self-service can be tracked by firms, and based on the analysis of customer experiences, the systems can be made more useful and easier to use (Akesson *et al.*, 2014).

LIMITATIONS AND FUTURE DIRECTIONS

The measured subjects of this research were general consumers. Because the sample was not obtained by using random sampling, some research limitations may affect the validity and generalizability of the research results. This research examined the direct impact of four factors influencing self-service by tapping general consumers. It is recommended that subsequent related researchers may investigate different industries offering self-service. Although external validity may be limited, this study can be used as comparative research with future research studies on self-service.

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Construct	Operation Definition	Reference Sources
Convenience	When customers use self-service, the service can save customers time and/or effort.	Alreck and Settle, 2002; Berry *et al*., 2002
Economy	The price for customers to use self-service is cheaper than non-self-service. (can save more money)	Lovelock and Young, 1979; Bonini and Rumiati, 2002
Security	Self-service provided a safe transaction environment and made customers easy to use.	Dabholkar *et al*., 2002; Parasuraman *et al*., 1985
Reduced Complexity	The use of self-service is simple, clear and easy to understand or complicated, vague and difficult.	Rogers, 1985; Kotler and Keller, 2012
Customer Value	The overall evaluation of the benefits and costs by using self-service.	Zeithaml *et al*., 2009; Kotler and Keller, 2012
Behavioral Intentions	The possibility that customers are willing to repurchases behavior.	Zeithaml *et al*., 2009

Source: Author's Presentation

Table 1. Operation Definitions of Constructs

	N	%
Gender		
Male	140	40%
Female	210	60%
Age (years)		
20-29	90	25.7%
30-39	122	34.9%
40-49	135	38.6%
>50	3	0.80%
Education		
High School	35	10.0%
Undergraduate	241	68.9%
Graduate	74	21.1%
Annual income		
Less than NT$10,000	30	08.6%
Between NT$10,000-30,000	82	23.4%
Between NT$30,001-50,000	122	34.9%
Between NT$50,001-75,000	80	22.9%
More than NT$75,001	36	10.2%

Source: Author's Computation

Table 2. Demographic Profiles of Respondents

	Items	Loadings	Cronbach's α	CR	AVE
Convenience	3	0.609	0.671	0.676	0.575
Economy	4	0.680	0.744	0.747	0.550
Security	5	0.768	0.832	0.838	0.654
Reduced Complexity	5	0.685	0.730	0.731	0.675
Customer Value	4	0.609	0.604	0.655	0.528
Behavioral Intention	3	0.985	0.711	0.712	0.558

Source: Author's Computation

Table 3. Reliability and Validity

Appendix-IV

	Mean	SD	1	2	3	4	5
1.Convenience	4.33	0.52					
2.Economy	3.28	0.74	0.10*				
3.Security	3.70	0.66	0.08	0.23**			
4.R. Complexity	4.21	0.40	0.38**	0.13**	0.38**		
5.Customer Value	4.15	0.41	0.27**	0.25**	0.28**	0.35**	
6. Behavioral Intention	4.34	0.46	0.56**	0.17**	0.31**	0.55**	0.42**

Source: Author's Computation
Notes: ** $p < 0.01$; *$p < 0.05$

Table 4. Descriptive Statistics and Correlation Matrix

Paths	β-value	p-value	Results
Direct relationships / direct effects			
H1 Convenience → Customer value	0.274	0.000	Supported
H2 Economy → Customer value	0.250	0.000	Supported
H3 Security → Customer value	0.285	0.000	Supported
H4 R.Complexity → Customer value	0.350	0.000	Supported
H5 Customer value → Behavioral Intention	0.428	0.000	Supported
Indirect relationships / mediating effects			
H6 Convenience → Behavioral Intention	0.483	0.000	Supported-partial mediation
Convenience → Customer value	0.565	0.000	
H7 Economy → Behavioral Intention	0.070	0.000	Supported-full mediation
Economy → Customer value	0.172	0.000	
H8 Security → Behavioral Intention	0.231	0.000	Supported-partial mediation
Security → Customer value	0.318	0.000	
H9 R.Complexity → Behavioral Intention	0.468	0.000	Supported-partial mediation
R.Complexity → Customer value	0.557	0.000	

Source: Author's Computation

Table 5. Summary of Hypothesized Relationships