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The Effect of E-commerce Service Quality Factors on Customer Satisfaction, Purchase Intention, and Actual Purchase in Uzbekistan

Veronika Lee, Seungwook Park, DonHee Lee[†]

Department of Business Administration, INHA University 100 Inha-ro, Michhol-gu, Incheon, Republic of Korea

ABSTRACT

Purpose: The purpose of this study is to analyze the impact of characteristics of the service quality of e-commerce platforms on customer satisfaction and purchase intention.

Design/methodology/approach: The proposed research model and a set of hypotheses were developed and tested using structural equation modeling based on data collected from 172 e-commerce users in Uzbekistan.

Findings: The findings of this study revealed that while the responsiveness of e-commerce platforms is non-essential, website design, reliability, perceived usefulness, and perceived ease of use are essential elements for customer satisfaction in e-commerce. The results indicated that website design, perceived usefulness, and customer satisfaction positively affect purchase intention for e-commerce platforms in Uzbekistan.

Research limitations/implications: The study provided that COVID-19 significantly impacted the development and acceptance of e-commerce platforms in Uzbekistan. The results of this study suggested practical insights for improving customer satisfaction and service quality on e-commerce platforms in Uzbekistan.

Originality/value: Uzbekistan is a developing country with great potential; however, until recently, little research has been conducted on the Uzbek e-commerce market. From this perspective, this study fills this gap by analyzing the relationship among service quality, technology acceptance factors, customer satisfaction, and purchase intention by applying the initial TAM model. Therefore, it is essential to determine the key factors for improving e-commerce service quality.

Keywords: Customer satisfaction, Service quality, Technology Acceptance Model (TAM), e-commerce, Uzbekistan

I. Introduction

The industry 4.0 era has embraced a new and improved way of doing business by using innovative digital technology worldwide, which has led to a shift in customer behavior (Reinartz *et al.*, 2019). For example, customers now rely more on digital devices to shop via e-commerce platforms than visiting traditional shopping places (Vasic *et al.*, 2019). Accordingly, enterprises have adapted to this change in customer purchasing patterns. For example, in 2016, the world's largest retailer, Walmart (National Retail Federation, 2021), began to acquire retail e-commerce companies to expand both its business and customer reach online. Such companies included Jet.com and Heyneedle (in 2016); Moosejaw, ModCloth, Bonobos, Parcel, and ShoeBuy.com (in 2017); and Flipkart, Eloquii, Bare Necessities, and Art.com (in 2018) (Walmart.com). As such, digitalization has had

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E-mail: dhlee04@inha.ac.kr

an impressive impact on the development of e-commerce.

Digitalization had also been boosted due to the COVID-19 pandemic. As a result of lockdowns and social distancing, retail businesses and customers have been forced into using an increasing number of e-commerce services (Choudhury, 2020). Bhatti et al. (2020) further reported that 52% of United States (US) customers avoid going to brick-and-mortar stores and crowded areas, and 36% prefer not to shop in-store until they have received a COVID-19 vaccine. Therefore, COVID-19 has had a significant impact on e-commerce growth. For example, Amazon, the world's largest e-commerce retailer (National Retail Federation, 2021), reported \$108.5 billion in sales in the first three months of 2021, a 44 % increase from 2020. It also saw a profit of \$8.1 billion, a 220% increase from the same period in 2020 (Weise, 2021).

Moreover, global digitalization and the COVID-19 pandemic have led e-commerce to significantly Increase in developing countries where technology diffusion is still low (De' *et al.*, 2020). For example, in the Republic of Uzbekistan, many customers have started to use e-commerce despite the lack of information technology (IT) infrastructure development. By the end of 2019, the Uzbek market potential was forecasted to reach USD 50 billion by 2050 (Antimonopoly Committee of the Republic of Uzbekistan, com). Therefore, as demand and e-commerce market potential have increased, market competition has become intense in Uzbekistan. It implies that Uzbekistan businesses need to develop sufficient business operational strategies in the e-commerce market.

Gounaris *et al.* (2010) suggested that a critical factor for surviving in a fiercely competitive e-environment is prioritizing service quality. Thus, the biggest challenge for e-commerce retailers in Uzbekistan is to improve, gain, and maintain service quality as their key competitive advantage. Brady and Robertson (2001) reported that improving service quality will lead to higher levels of customer satisfaction, resulting in more favorable behavioral intentions. A company should offer a superior customer experience through high service quality to ensure repurchase intention and brand loyalty (Gounaris *et al.*, 2010). Therefore, it

is essential to determine the key factors necessary for improving e-commerce service quality in Uzbekistan.

Müller (1991) suggested that customer satisfaction is a strategic competitive advantage. Meanwhile, Ramkumar et el. (2019) stated that the technology acceptance model's factors of perceived ease of use (PEOU) and perceived usefulness (PU) impact customer satisfaction. Moreover, Koufaris (2002) also argued that in the e-commerce environment, PU and PEOU are strong predictors of a website's customer retention. Accordingly, it is essential to better understand ecommerce users' attitudes toward advanced technologies in Uzbekistan.

Previous studies have investigated service quality, customer satisfaction, purchase intention, and technology acceptance in e-commerce (Moslehpour *et al.*, 2018). However, the Uzbekistan e-commerce market has only recently emerged; therefore, there is a gap in the literature. Therefore, this study investigates the relationship between service quality and technology acceptance factors in Uzbekistan. This study had the following objectives: (1) to analyze the characteristics of service quality in the e-commerce environment in Uzbekistan; and (2) to examine the relationship among technology acceptance factors, service quality, customer satisfaction, purchase intention, and actual purchase.

The remainder of this paper is organized as follows. Section 2 provides the literature review and concepts underlying theories. Section 3 proposes a research model and hypotheses development. Section 4 reports the data analysis and results of this study. Section 5 presents the conclusion and limitations of the study.

II. Literature Review

A. E-commerce

The rapid growth of the Internet has dramatically impacted the retail industry and has resulted in an online presence being paramount to achieving a competitive advantage (Lee & Lin, 2005; Dhingra et al., 2020). There has been a significant increase in the popularity of e-commerce, with many customers preferring to shop on e-commerce platforms (McLean & Wilson, 2016; Khatoon et al., 2020). E-commerce shopping has also become increasingly prevalent because companies such as PayPal offer secure payment methods (Nisar & Prabhakar, 2017). E-commerce involves maintaining relationships and conducting business transactions by selling information, services, and goods via computer telecommunications networks (Zwass, 2022). According to Bloomenthal (2021). the concept of e-commerce includes retail, wholesale, dropshipping, crowdfunding, subscriptions, physical products, digital products, and services. Therefore, there are vast options for services and products easily accessible online, which is infinitely more appealing to shoppers. E-commerce platforms are beneficial for both customers and businesses, and they provide managers with access to a gold mine of analytic tools to improve effective retailing methods (Trong & Tran, 2021). From the customer perspective, the benefits of using e-commerce include higher and better-quality information availability about a product, a more extensive assortment of products, greater transparency across vendors, and potentially lower prices (Reinartz et al., 2019).

Law of the Republic of Uzbekistan (2015) defined e-commerce as the "implementation of transactions by parties stipulated by law for actions and operations in negotiating and executing transactions on selling and delivering goods, operations, provision of services, and accomplishment of other operations by an agreement concluded with the use of information systems aimed at making a profit based on electronic procedures" (Mekhmonov & Temirkhanova, 2020). Mekhmonov and Temirkhanova (2020) defined ecommerce in Uzbekistan as "a functionally interconnected complex of entities with the participation of buyers, sellers, financial institutions, elements of unification of state regulation, transaction security, and information and communication technologies based on an integrated approach." The e-commerce market potential is estimated to be worth around USD 1.2 billion. While the share of e-commerce sales in Uzbekistan accounts

for less than 1%, it has a growth rate of 30% (Ubbiniya & Diping, 2019).

Despite its potential, e-commerce remains underdeveloped in Uzbekistan. However, the situation is changing, and e-commerce has more recently become a priority. In May 2018, the president of Uzbekistan signed the decree on measures for the 'Accelerated Development of Electronic Commerce' and approved the 'Program for the Development of E-Commerce' in Uzbekistan for 2018-2021 (Islamov & Isokhujaeva, 2021). From 2018, the Uzbekistan government started paying more attention to the development of e-commerce, and the 'Open Digital Ecosystem' for e-commerce is planning to start operation in 2022 (UZREPORT, 2021). As Uzbekistan can be seen as an early stage of e-commerce development compared to other countries, it is essential to understand the factors that influence the value creation of service quality in Uzbekistan e-commerce during this early development stage.

B. Technology Acceptance Model

Davis's (1989) technology acceptance model (TAM) is one of the most widely used theories in information systems research (Heikoop et al., 2020). The TAM explains how the determinants of advanced technology acceptance enable an understanding of users' behavior across a broad range of IT. Davis and Venkatesh (1996) developed the TAM 2 by adding social influences and cognitive instrumental processes. To ascertain the limitations of the TAM and TAM 2, Venkatesh et al. (2003) developed the unified theory of acceptance and use of technology (UTAUT) by integrating the theory of reasoned action (Fishbein & Ajzen, 1975), technology adoption model (Davis, 1989), motivational model (Davis et al., 1992), theory of planned behavior (TPB) (Ajzen, 2002), combined TAM-TPB (Taylor & Todd, 1995), model of personnel computer utilization (Thompson et al., 1991), innovation diffusion theory (Rogers, 2003), and social cognitive theory (Bandura, 1986). The UTAUT includes performance expectancy, effort

expectancy, social influence, and facilitating conditions. However, as the UTAUT, similar to the TAM, has been criticized for not capturing all variables related to the use of technology, Venkatesh *et al.* (2012) proposed the UTAUT 2 to incorporate hedonic motivation, price value, and habits (Lee & Lee, 2020).

Two constructs can be easily identified from the aforementioned theories: perceived usefulness (PU) and perceived ease of use (PEOU). According to Davis (1989), users will decide whether to adopt new IT based on two rational assessments: (1) PU and (2) PEOU. PU refers to a user's expectation that new IT will improve their productivity; PEOU refers to the degree to which a user believes that the system will be easy to use (Davis, 1989; Qiu & Li, 2008). Moslehpour *et al.* (2018) stated that PU and PEOU influence customer purchase intention online.

E-commerce platforms can only be used when available devices with an Internet connection, yet such devices remain scarce in developing countries (Singhal et al., 2013). Meanwhile, Internet access is difficult in developing countries (Singhal et al., 2013). Only 60% of the population has access to the Internet in Uzbekistan, compared to 96% in Europe (Kemp, 2020). Accordingly, weak national government strategies and the underdevelopment of adequate infrastructure and socioeconomics have created significant barriers to the use of e-commerce in developing countries (Singhal et al., 2013). Moreover, the early development stages of the Internet and e-commerce also make it difficult for businesses to digitalize and exploit e-commerce platforms (Kituvi, 2020). Hence, even though there are more detailed and advanced models to examine technology acceptance, the current study uses the primary TAM model's two main constructs (PU and PEOU) because Uzbekistan is still developing regarding its Internet and IT availability.

C. Service Quality

Quality is a key element for a business to be successful (Dale, 1999). Without a management approach that guarantees the quality of its systems, staff, and suppliers, a company will not deliver the appropriate level of service quality to satisfy its customers (Cox & Dale, 2002). Parasuraman et al. (1985) defined service quality as the distance between customers' expectations and evaluations on a multi-item scale called SERVQUAL (service quality). The SERVQUAL model consists of five dimensions: tangibles, referring to the physical facilities and appearance of personnel; reliability, meaning the ability to deliver promised services accurately and on time; responsiveness, which includes understanding customer needs and providing help quickly; assurance, meaning the knowledge that employees must possess to inspire customer trust and confidence; and empathy, referring to the provision of a caring and personalized customer approach.

Many scholars have argued that the components of SERVQUAL cannot fully evaluate customers' perceptions of service quality in specific industries (Cronin & Taylor, 1992). Meanwhile, Gefen (2002) provided that in an e-commerce environment, the SERVQUAL scale did not clearly state the five original service quality dimensions. Many other empirical studies (Wolfinbarger & Gilly, 2003) have made it clear that challenges in measuring web-based service quality exist due to the differences between web-based and traditional customer service and the importance of adapting the original SERVQUAL model to the e-commerce market correctly. Accordingly, in the e-commerce context, many researchers have modified SERVQUAL into several models, such as WebQual (e.g., Barnes & Vidgen, 2002), eTailQ (Wolfinbarger & Gilly, 2003), E-S-Qual (Parasuraman et al., 2005), and the latest hierarchical model of e-service quality proposed (Blut et al., 2015). Thus, the dimensions of SERVQUAL and other quality measurement models should be replaced for e-commerce quality.

Previous research indicates three determinants of service quality are necessary for customer satisfaction in e-commerce: website design, responsiveness, and reliability. Website design factors strongly influence customer satisfaction, loyalty, and quality judgment (Wolfinbarger & Gilly, 2003). E-commerce platform responsiveness refers to the frequency with which a platform voluntarily provides services to customers (e.g., customer inquiries, information retrieval, and navigation speed) (Parasuraman *et al.*, 1988; Tran & Vu, 2019); it also measures how well a business can serve customers when they encounter issues (Gefen, 2002). In addition, e-commerce platforms are reliable if they fulfill orders correctly, deliver products promptly, and keep personal information secure (Tran & Vu, 2019).

D. Customer Satisfaction

Customer satisfaction is a primary goal of ecommerce (Anderson *et al.*, 1994) and is viewed as a critical goal for all business activities (Anderson *et al.*, 1994). No business can survive or maintain competitiveness without an appropriate level of overall customer satisfaction (Nisar & Prabhakar, 2017). Moreover, business theorists emphasize the importance of customer satisfaction in a business's success. It is more profitable to retain current customers than to win new ones to replace those who leave (Reichheld & Sasser, 1990). Since customer satisfaction serves as a baseline for improvement, it is essential to determine its fundamental characteristics.

Customer satisfaction is also defined as the valueadding difference between a customer's expectation and experience; in short, customers are satisfied when the consumed product or service meets or exceeds their expectations (Suchánek & Králová, 2018). In the e-commerce context, Hansemark & Albinson (2004) define satisfaction as "the fulfillment of requirements, goals, or desires, and this can be reflected by the overall customer attitude toward e-commerce retailers, or is an emotional interaction with respect of between what online customers expect and what they obtain." In short, e-satisfaction is described as customer satisfaction that comes from previous purchase experiences with certain e-companies. E-satisfaction is an essential component in determining the success of online shopping (Vasic et al., 2019).

Previous studies have investigated the factors influencing customer satisfaction in the e-commerce environment. Sharma and Lijuan (2015) suggest that services provided by website systems influence customer satisfaction in an e-commerce environment. Lin *et al.* (2011) focused on website system qualities, as proposed in the information systems success model, and other factors, such as product quality, delivery quality, and perceived price. They argue that these factors are also important in the online shopping process as they reflect the outcome of online shopping; meanwhile, the authors also suggest that customers consider the product and delivery more important.

E. Customer purchase intention

Purchase intention is a dependent variable that concerns several external and internal factors, such as outcome expectations, values, recommendations, and emotional associations (Bakar *et al.*, 2018). Purchase intention can be defined as a customer's willingness to buy a particular product or service. E-commerce purchase intention is a customer's willingness to perform a specific behavior to buy a product or service from an online marketplace. The customer's trust influences the intention in online transactions (Kim, 2020). Online purchase intention can be defined as a factor that predicts a customer's behavior toward an action that finalizes a negotiation using the Internet (Mainardes *et al.*, 2019).

Zeithaml *et al.* (1996) defined purchase intention as a dimension of behavioral intention. Examining purchase intention helps predict actual customer behavior (Ajzen & Fishbein, 1980). The same applies in an e-commerce environment since purchase intention can characterize customers' actual purchasing behavior in an online shopping environment. Thus, purchase intention is the most accurate predictor of customers' actual purchase behavior online.

III. Research Model and Hypothesis Development

E-commerce platforms' service quality provided by e-commerce platforms and technologies should be adequate to increase customer satisfaction and purchase intention. Thus, SERVQUAL and TAM were adapted to suit Uzbekistan's e-commerce market based on the literature review. The service quality dimensions in the e-commerce environment included website design, reliability, and responsiveness. PU and PEOU were adopted from the TAM.

This study examines how service quality dimensions and technology acceptance factors affect customer satisfaction and purchase intentions in e-commerce. It also examines the impact of (1) customer satisfaction on purchase intention; (2) customer satisfaction on actual purchase; and (3) the relation between purchase intention on the actual purchase. Figure 1 shows the proposed hypotheses and research model.

A. Hypothesis development

According to Lan *et al.* (2021), e-commerce service providers' PU is one of the most important determinants of customer satisfaction. Humbani and Wiese (2019) also addressed that PU positively influences user satisfaction in the e-commerce environment. PEOU plays a crucial role in predicting and determining users' desire to use an information system and drives customer satisfaction when shopping online (Hendar & Rhemananda, 2020; Yang *et al.*, 2021). Further, it plays a significant role in providing high customer satisfaction because it increases efficiency when using a service and enhances customer trust (Gefen, 2002). Alalwan (2020) proposed that PEOU positively influenced customer satisfaction when using e-commerce in Jordan.

Overall, a prospective customer's ease of use and usefulness in accessing relevant information on an e-commerce website, social media account, and so on can affect the extent to which they feel in control of a website (Kandampully *et al.*, 2016). Ngubelanga and Duffett (2021) suggested that PU and PEOU were positively associated with e-commerce service users' satisfaction. Thus, the following hypotheses are proposed.

- H1: Perceived usefulness of an e-commerce platform will have a positive effect on customer satisfaction.
- H2: Perceived usefulness of an e-commerce platform will have a positive effect on customer purchase intention.



Figure 1. Research Model

- **H3:** Perceived ease of use of an e-commerce platform will have a positive effect on customer satisfaction.
- **H4:** Perceived ease of use of an e-commerce platform will have a positive effect on customer purchase intention.

While offline businesses always have service personnel to help customers during the purchasing process, customers who use e-commerce services complete the entire purchase process without assistance (McLean & Wilson, 2016). Therefore, when shopping online, the only contact point between a business and customers is the business's website or user interface. Hence, website design is a key factor in the success of e-business because it provides potential customers with their first impression (Tandon *et al.*, 2020). A sophisticated website design will maximize customer reach, customer satisfaction, and customers' revisit intention (Lan *et al.*, 2021).

Rita *et al.* (2019) empirically provided that the overall service quality of e-commerce is closely related to customer satisfaction. Rashid and Rokade (2019) suggested that customer satisfaction and service quality significantly influenced customer retention, market share, and profitability. Moreover, customers' satisfaction levels are strongly associated with repeat purchase intention (Lan *et al.*, 2021). As previous studies have suggested that website design is directly related to the user interface (Blut, 2016; Cao *et al.*, 2005; Rita *et al.*, 2019), it is important for creating customer satisfaction and purchase intention. Accordingly, website design is recognized as a predictor of customer satisfaction and purchase intention. Therefore, the following hypotheses are suggested.

- **H5:** The website design of an e-commerce platform will have a positive effect on customer satisfaction.
- **H6:** The website design of an e-commerce platform will have a positive effect on customer purchase intention.

Reliability refers to the ability to perform a task correctly and unfailingly (Raza *et al.*, 2020). Parasuraman et al. (1985) suggested that reliability means that a business will conduct a service correctly the first time and fulfill its promise. E-commerce platforms must provide customers with error-free services and secure online transactions to satisfy them (Lee & Lin, 2005).

According to Parasuraman *et al.* (1988) and Gajewska *et al.* (2019), reliability is the most critical factor when assessing the quality of e-commerce service. Hong *et al.* (2019) prove that reliability in the ecommerce environment is strongly influential on customer satisfaction and purchase intention. Wilson and Christella (2019) addressed that customer satisfaction is highly related to reliability in the Indonesian e-commerce industry. Thus, the following hypotheses are proposed.

- **H7:** The reliability of an e-commerce platform will have a positive effect on customer satisfaction.
- **H8:** The reliability of an e-commerce platform will have a positive effect on customer purchase intention.

Sheng and Liu (2010) defined responsiveness as the promptness of an e-commerce service provider's response to a customer. Ali and Raza (2015) and Dhingra et al. (2020) argued that responsiveness is critical for retaining customer satisfaction and loyalty. Rita et al. (2019) suggested that responsiveness positively and closely correlates with satisfaction and repurchase intention in e-commerce. The results of other studies have revealed that customer satisfaction and responsiveness are significant predictors of customer purchase intention (Khatoon et al., 2020). The literature has also provided empirical evidence that supports website responsiveness as one of the most critical service quality attributes for e-commerce platform users. Moreover, Ali and Raza (2015) provided that responsiveness has a positive and significant impact on customer satisfaction in Pakistani Islamic banks' electronic platforms; Pakistan is also a developing country like Uzbekistan. Therefore, the following hypotheses are suggested.

H9: The responsiveness of an e-commerce platform

will have a positive effect on customer satisfaction.H10: The responsiveness of an e-commerce platform will have a positive effect on customer purchase intention.

Satisfaction is closely related to customer attitude and directly influences their positive purchase intention (Chiu & Cho, 2021). The previous studies have also confirmed a significant relationship between e-commerce platforms' service quality, customer satisfaction, and purchasing behavior (Blut *et al.*, 2015; Dash *et al.*, 2021). Moreover, Chek and Ho (2016) addressed the evidence that if a customer previously had a good purchasing experience from a website, they would be likely to repurchase from the same website. Chi (2018) also provided that customer satisfaction regarding website use would positively affect their intention to purchase from that website.

Mahadin et al. (2020) argued that customer satisfaction is necessary for repurchase intention to promote a sustainable relationship with customers, while Ali Abumalloh et al. (2020) suggested that customer satisfaction announces online purchase intention. Quan et al. (2020) reported that customer satisfaction, customer retention, and repurchase intention are positively correlated. The theory of reasoned action proposes that behavior can be predicted from intentions that correspond directly (in terms of action, target, and context) to that behavior (Ajzen & Fishbein, 1980). Purchase intention can be used to represent customers' actual purchasing behavior in an online shopping environment (Nisar & Prabhakar, 2017). Therefore, a customer's purchase intention will provide an acceptable proxy for their actual online purchase behavior. The following hypotheses are developed.

- **H11:** Customer satisfaction will have a positive effect on purchase intention.
- **H12:** Customer satisfaction with an e-commerce platform will have a positive effect on the actual purchase.
- **H13:** Customer purchase intention of an e-commerce platform will have a positive effect on the actual purchase.

IV. Research Methodology

A. Data Collection

The questionnaire for this study was prepared based on the literature review and underwent a double translation protocol (Survey Research Center, 2011). The questionnaire was first developed in English and then was translated into Uzbek and Russian by a bilingual faculty member in the service management area. The Uzbek and Russian versions of the questionnaire were then translated into English by another bilingual faculty member in the management field. Afterward, these two bilingual faculty members examined the translated English versions of the questionnaires to confirm no significant difference.

A pretest of the questionnaires, either Uzbek or Russian, was conducted with ten respondents aged over 19 years to confirm no semantic problems. After that, the questionnaires were posted on several social networking sites and emailed to targeted respondents. The data were collected from May 1 to July 30, 2021. Participation was voluntary; subjects gave informed consent for inclusion before participating in the study. Respondents had to meet the selection criteria: they had to be aged over 19 years and have visited an e-commerce platform, made a purchase on an ecommerce platform, or used an e-commerce service at least once in the past three years. A total of 280 questionnaires were completed, 45 of the Uzbeklanguage version and 135 of the Russian-language version. Of the 280 responses, 172 (61.4%) were suitable for the study. Table 1 presents the 25 items used to measure each construct in the study. All questions were measured using a seven-point Likert-type scale (1 = strongly disagree, 7 = strongly agree), except for inquiries related to respondents' demographics.

The respondents' demographic characteristics are summarized in Table 2. 100% of respondents had experienced purchasing on an e-commerce platform. 53% of respondents used two or more e-commerce platforms for their purchases, 24% used only webpages, and 11% used Instagram. About 40% of respondents had used e-commerce services four to five times

#	Construct	Measurement	Reference
1		"A" retailer makes it easier to shop	
2	Perceived	"A" retailer provides fun buying experience	Davis [30]
3	userumess	"A" retailer enables more efficient shopping	
4		Navigation at the "A" retailer is understandable and clear	Davis [30].
5	Perceived ease of use	"A" retailer is easy to use	Kassim and Abdullah
6	cuse of use	It would be easy for me to become skillful at using "A" retailer	[49]
7		Information at "A" retailer is well organized	
8	Website	The text on the "A" retailer's website is easy to read for me	Blut [17]; Cao et al [20]
9	uesign	I have experienced correct technical functioning on "A" retailer's website	
10		"A" retailer shows a sincere interest in solving customers' problems	~ ~ ~ ~ ~
11	Reliability	When "A" retailer promises to do something at a particular time, it does so	Gefen [38]; Lee and Lin [57]
12		"A" retailer has adequate security	Lee and Lin [57]
13		"A" retailer is prompt in replying to queries/requests	Cao et al [20]: Gefen
14	Paspansivanass	It is easy to get in contact with "A" retailer	[38]; Kassim and
15	Responsiveness	"A" retailer is always willing to help customers	Abdullah [49]; Lee and
16		Loading time when buying via "A" retailer is reasonable	Lin [57]
17		"A" retailer fully meets my needs	Raza et al. [78];
18	customer	I am generally satisfied with total experience of buying via "A" retailer	Rita et al. [81];
19	Suisiaetion	I feel pleasure when buying via "A" retailer	Vasic et al.[95]
20		I will repurchase from "A" retailer in the future	-
21	Purchase	I will recommend using "A" retailer to other people	Raza et al. [78]; Rita et al [81]
22		I would like to say positive things about "A" retailer to other people	ina er an [oi]
23		I usually use the "A" retailer to purchase products/services at least once	
~ /	Actual	in a few month	Cho et al. [24];
24	purchases	I purchase products/services from the "A" retailer on regular basis	Shi et al. [85]
25		I have bought many products/services from the "A" retailer	

Table 1. Measurement Items

during the past six months. 71% of respondents bought at least two types of goods on e-commerce platforms.

As presented in Table 3, 66 respondents (38%) had experienced returning the purchase. 37% of these 66 respondents had returned a purchase one to three times during the past six months. 23% of people, who experienced returning the purchase, claimed they returned a purchase because of a mismatch with the description, and 13% simply changed their mind. 30% found it easy to return a purchase, and 31% were satisfied with the return policy and procedure (5% were very satisfied). Meanwhile, 8% said it was not easy to return the purchase, and 6% were not satisfied (1% were not satisfied at all).

As shown in Table 4, the percentage of goods bought at e-commerce platforms gradually grew from 2018 to 2020 in Uzbekistan. Respondents (74.42%) are willing to continue to purchase goods on e-commerce platforms even after COVID-19.

B. Variables of the Model

SPSS 21.0 and AMOS 21.0 were used for data analysis and perform confirmatory factor analysis (CFA) to examine the reliability and validity of the measurement model. To test the hypotheses, structural equation modeling was employed.

Dimensions	Item	Frequency	Percentage (%)	Dimensions	Item	Frequency	Percentage (%)
Candan	Female	102	59.30	Actual purchase	Yes	172	100.00
Gender	Male	70	40.70	experience	No	0	0.00
	19-20	22	12.79		Using at least 2 platforms	91	52.91
	21-30	128	74.42	Types of	Web page	42	24.42
Age	31-40	16	9.30	e-commerce	Instagram	19	11.05
	41-60	5	2.91	plationins	Telegram	16	9.30
	51-60	1	0.58		Others	4	2.33
Marital status	Single	112	65.12	Purchase	More than 3 times and less than 6 times	64	37.21
	Married	60	34.88	during last 6	More than 6 times	47	27.33
	Tashkent	140	81.40	month	Less than 3 times	61	35.47
Place	Other cities	32	18.60	_	Purchasing at least 2 types of goods	122	70.93
	Corporate worker	70	40.70	_	Apparel and shoes	25	14.53
	Student	61	35.47	Types of goods	Digital devices	9	5.23
Desfersion	Other	16	9.30	purchased	Cosmetics	8	4.65
Protession	Unemployed	13	7.56		Food/Groceries	4	2.33
	Freelancer	10	5.81		Other	3	1.74
	Entrepreneur	2	1.16		Books	1	0.58

Table 2. Characteristics of Respondents

Table 3. Order Returning Experience of Respondents

Dimensions			Item	Frequency	Percentage(%)
	No			106	61.63
				66	38.37
		The number of times of	more than 1 less than 3	63	95.45
		returning goods in last	more than 3 less than 5	2	3.03
		unce monui	more than 5 times	1	1.52
		The reason for returning	Item details were different from the description	39	59.09
Order		goods	I have changed my mind	22	33.33
experience	Yes		Other	5	7.58
		Whether it was easy to return goods Satisfaction level after	Yes	52	78.79
			No	14	21.21
			Satisfied	45	68.18
		returning the goods	Not satisfied	11	16.67
			Very satisfied	8	12.12
			Not satisfied at all	2	3.03

First, principal component analysis (PCA) was performed using varimax factor analysis to clarify

the relationships between factors. Second, confirmatory factor analysis (CFA) was performed on the adapted

survey instrument to reaffirm the results of the PCA. Reliability was tested using Cronbach's alpha, as shown in Table 5; all the coefficients for the constructs exceeded the threshold value of 0.70, which means that all constructs meet the reliability criteria (Nunnally, 1978).

Table 5 presents the results of PCA using the varimax rotation matrix. The factor loading values of eight components were above 0.60. CFA was used to assess overall measurement quality (Anderson &

Gerbing, 1998); standardized factor loading should be above 0.6 (Hu & Bentler, 1999). Table 5 shows the results of the standardized factor loadings and t-values for measurement variables of CFA with all standardized factor loadings exceeding 0.7.

The average variance extracted (AVE) and composite reliability (CR) are needed to reach an acceptable level of 0.5 and 0.6, respectively. As shown in Table 5, there are no validity problems. Regarding the t-value,

Table 4.	COVID-19	Related	Experience	of	Respondents

Dimensions	Item	Freque	ncy Percenta	ge	Frequency	Percentage (%)	Frequency	Percentage (%)
	Year		2018		2	2019	202	0
Percentage of	less than 20%	135	78.49		99	57.56	54	31.40
goods bought at	more than 20% less than 50%	22	12.79		56	32.56	78	45.35
platform in	more than 50% less than 70%	9	5.23		12	6.98	33	19.19
2018-2020	more than 70%	6	3.49		5	2.91	7	4.07
Dimensions	Item Fr	equency	Percentage (%)	Din	nensions	Item	Frequency	Percentage
Frequency of	strongly agree	72	41.86	Willin	gness to	strongly agree	66	38.37
purchasing at	agree	45	26.16	continue to purchase goo e-commerce platforms at	ie to se goods at	agree	62	36.05
platform has increased after	neither agree nor disagree	26	15.12		nerce ms after	neither agree nor disagree	30	17.44
COVID-19	disagree	18	10.47	COVII	D-19 is over	disagree	10	5.81
	strongly disagree	11	6.40			strongly disagree	4	2.33

Table 5. Results of Cronbach's Alpha, AVE, CR, PCA, and CFA

		PCA		CFA	1			Composito	
Construct	Variables	Eigen value	Factor loading	Standard factor loading	t-value	Cronbach's α	AVE	reliability (CR)	
	PU1		0.647	0.767	-				
Perceived	PU2	1.179	0.734	0.797	10.23	0.812	0.652	0.849	
userumess	PU3		0.708	0.772	9.918				
	PEU3		0.741	0.784	-				
Perceived	PEU3	1.102	0.709	0.838	10.94	0.828	0.685	0.867	
cuse of use	PEU3		0.74	0.738	9.657				
	WD1		0.712	0.733	-		0.561	0.793	
Website design	WD2	10.718	0.676	0.716	8.476	0.779			
	WD3		0.716	0.758	8.898				
	RES1		0.799	0.74	-				
D	RES2	1 472	0.773	0.745	9.114	0.822	0.557	0.824	
Responsiveness	RES3	1.4/2	0.744	0.776	9.46	0.832	0.55/	0.834	
	RES4		0.645	0.717	8.774				

		PCA	A	CFA				Commonito	
Construct	Variables	Eigen value	Factor loading	Standard factor loading	t-value	Cronbach's α	AVE	reliability (CR)	
	REL1		0.763	0.753	-				
Reliability	REL2	2.069	0.728	0.757	9.271	0.813	0.583	0.808	
	REL3		0.722	0.799	9.7				
	SAT1		0.766	0.805	-				
Customer	SAT2	0.96	0.792	0.905	13.68	0.894	0.789	0.918	
Satisfaction	SAT3		0.73	0.873	13.13				
	PI1		0.753	0.814	-				
Purchase	PI2	0.891	0.76	0.905	13.86	0.893	0.737	0.893	
intentions	PI3		0.74	0.859	13.04				
	AP1		0.763	0.718	11.24				
Actual purchase	AP2	0.782	0.875	0.908	15.59	0.873	0.626	0.833	
	AP3		0.863	0.895	-				

Table 5. Continued

Table 6. Results of Fit Indices for CFA

Fit measurement	χ^2 /d.f (p)	GFI	RMR	IFI	NFI	TLI	CFI	RMSEA
Measurement index	1.388(<.01)	0.872	0.043	0.963	0.88	0.955	0.963	0.047
Recommendation index	< 2.5(>.05)	> .900	< .080	> .900	> .900	> .900	> .900	< .050

Note: IFI: incremental fit index, TLI: Tucker-Lewis index

the greater the magnitude of the t-value, the greater the evidence against the null hypothesis. This indicates that there is greater evidence for a significant difference. The closer the t-value is to zero, the more likely there is no significant difference.

Table 6 shows that the goodness of fit index (GFI) and normalized fit index (NFI) are 0.872 and 0.880, respectively, which is slightly lower than the recommended value of 0.9 (Joreskog & Sorbom, 1996) but is still acceptable (Bagozzi and Yi, 1988). The root mean square residual (RMR) is 0.043, which is smaller than the value of 0.80, which indicates that it is acceptable. The non-incremental fit index, such as the comparative fit index (CFI), is 0.963, which exceeds the recommended cut-off level of 0.9 (Bagozzi & Yi, 1988). Finally, the root mean square error of approximation (RMSEA) is 0.047, which suggests that the data have a good fit (Bagozzi and Yi, 1988). According to Hu and Bentler (1999), and RMSEA value of \leq 0.06 indicates a good-fitting model relative

to the model's degree of freedom. The RMSEA estimates the lack of fit in a model compared to a perfect model. Based on all statistics, the model fits the data very well and generates a good fit. Therefore, the measurement model is a good fit for the collected data.

The convergent validity was estimated based on testing the AVE. The prerequisite of convergent validity is that the AVE crosses the lower limit of acceptability of 0.50 (AVE \geq 0.50). The AVE values for all model variables are over 0.50, with the lowest value being 0.746 for responsiveness, meaning that the prerequisite is fulfilled (see Table 7).

C. Hypothesis Testing

The results of the goodness of fit test for the proposed research model are the following: CFI = 0.963, RMSEA = 0.047, RMR = 0.043, incremental fit index = 0.963, Tucker-Lewis index = 0.955, and

Factor	Website design	Reliability	Responsiv eness	Perceived usefulness	Perceived ease of use	Customer satisfaction	Purchase intention	Actual purchase
Website design	0.749							
Reliability	0.654	0.764						
Responsiveness	0.524	0.678	0.746					
Perceived usefulness	0.695	0.621	0.701	0.807				
Perceived ease of use	0.709	0.650	0.607	0.698	0.828			
Customer satisfaction	0.711	0.621	0.435	0.655	0.676	0.888		
Purchase intention	0.709	0.611	0.547	0.704	0.610	0.691	0.858	
Actual purchase	0.497	0.416	0.315	0.518	0.484	0.519	0.528	0.712
CR	0.561	0.557	0.583	0.652	0.685	0.789	0.737	0.626
AVE	0.793	0.834	0.808	0.849	0.867	0.918	0.893	0.833

Table 7. Result of Discriminant Validity Test

Note: CR (Composite Reliability) = \sum (factor loading)2 / [(factor loading)2 + \sum (error)] AVE = \sum (factor loading)2 / [\sum (factor loading)2 + \sum (error)]

Table 8. Results of Hypotheses Test

	Hypothesis	Unstandardized coefficient	Standardized coefficient	<i>t</i> -value	Results
H1	Perceived usefulness -> Customer satisfaction	0.302^{*}	0.300	2.183	accepted
H2	Perceived usefulness -> Purchase intention	0.334*	0.282	2.028	accepted
Н3	Perceived ease of use -> Customer satisfaction	0.259^{*}	0.254	2.096	accepted
H4	Perceived ease of use -> Purchase intention	-0.061	-0.051	-0.430	rejected
Н5	Website design -> Customer satisfaction	0.297^{*}	0.294	2.197	accepted
H6	Website design -> Purchase Intention	0.320^{*}	0.276	2.052	accepted
H7	Responsiveness->Customer satisfaction	-0.252	-0.252	-2.045	rejected
H8	Responsiveness -> Purchase intention	0.078	0.066	0.540	rejected
H9	Reliability -> Customer satisfaction	0.234*	0.250	2.054	accepted
H10	Reliability -> Purchase Intention	0.089	0.081	0.671	rejected
H11	Customer satisfaction -> Purchase intention	0.312**	0.265	2.342	accepted
H12	Customer satisfaction -> Actual purchase	0.393**	0.308	2.780	accepted
H13	Purchase intention -> Actual purchase	0.350***	0.323	2.908	accepted

* p<.05; ** p<.01

 $\chi 2/df = 1.388$; the normalized fit index (0.88) and goodness of fit index (0.872) were below the required threshold.

Table 8 presents the results of the significance test for hypotheses tests. For H1 and H3, the standardized path coefficient between customer satisfaction and PU (H1) was 0.300, and PEOU (H3) was 0.254. These coefficients are statistically significant at the .05 level, supporting H1 and H3.

The results imply that the PU and PEOU of an e-commerce platform influence customer satisfaction.

For H2, the standardized path coefficient between PU and purchase intention was 0.282 and statistically significant at the 0.05 level, supporting H2. For H4, the standardized path coefficient between PEOU and purchase intention was -0.051 and insignificant, thus not supporting H4. These results indicate that it is essential for e-commerce platform users in Uzbekistan

to feel that it is more efficient and productive to shop online to have the intention to purchase online. Meanwhile, an e-commerce platform's ease of use does not make a difference. Technology in Uzbekistan is still underdeveloped, especially when compared to South Korea. Therefore, it may be concluded that Uzbek consumers can not yet fully acknowledge the ease of use of the e-commerce platform. However, the result of this study did not satisfy previous studies' results. Thus, over time when technology development in Uzbekistan will be more advanced, there is a need to investigate this hypothesis. In addition, website design, PU, and customer satisfaction have a positive effect on purchase intention at e-commerce platforms in Uzbekistan.

For H5, H7, and H9, the standardized path coefficient between customer satisfaction and website design (H5), responsiveness (H7), and reliability (H9) were 0.294, -0.252, and 0.250, respectively. H5 and H9 were statistically significant at the .05 level, supporting H5 and H9. However, H7 was not significant, thus not supporting H7. These results suggest that while e-commerce platforms' responsiveness is non-essential, website design and reliability are important factors for improving customer satisfaction in e-commerce.

For H6, H8, H10, and H11, the standardized path coefficient between purchase intention and website design (H6), responsiveness (H8), reliability (H10), and customer satisfaction (H11) were 0.276, 0.066, 0.081, and 0.265, respectively. H6 and H11 were statistically significant at the 0.05 level, supporting H6 and H11. Therefore, the results imply that website design is crucial and significantly affects customer purchase intention. However, H8 and H10 are not significant, thus not supporting H8 and H10. Responsiveness in this study did not affect the purchase intention and customer satisfaction. This result implied that e-commerce retailers in Uzbekistan did not reply quickly as requested by customers. Therefore, this research suggested that an operation strategy based on the characteristics of the people of that country is necessary to promote consumer purchase intention. As e-commerce development has recently started in Uzbekistan, customers' trust in online transactions is still weak. It means that Uzbek people do not have full trust in e-commerce platforms. Although the reliability of an e-commerce platform positively affects customer satisfaction (H9), the reliability of an e-commerce platform does not directly affect purchase intention (H10).

For H12 and H13, the standardized path coefficient between actual purchase and customer satisfaction (H12) and purchase intention (H13) were 0.308 and 0.323, respectively. H12 and H13 were statistically significant at the .01 level, supporting H12 and H13. The results imply that a high level of customer satisfaction positively affects purchase intention and actual purchase. These results were similar to the previous study (e.g., Dhingra *et al.*, 2020).

V. Conclusions

This study combines the SERVQUAL and TAM models to empirically analyze the factors influencing customer satisfaction, purchase intention, and actual purchase via e-commerce in Uzbekistan. It explores the relationships between website design, responsiveness, reliability, PU, PEOU, customer satisfaction, purchase intention, and actual purchase.

The study results confirmed positive relationships between PU and customer satisfaction (H1), PU and purchase intention (H2), and PEOU and customer satisfaction (H3) in Uzbek e-commerce. The study results confirmed the positive effects of website design (H5 and H6) on customer satisfaction and purchase intention in Uzbek e-commerce. The study confirmed positive relationships between reliability and customer satisfaction (H9) and customer satisfaction and purchase intention (H11) in Uzbek e-commerce. The study results confirmed the positive effects of customer satisfaction (H12) and purchase intention (H13) on actual purchases in Uzbek e-commerce. However, no positive relationships were found between PEOU and purchase intention (H4), responsiveness, and customer satisfaction (H7) and (H8), as well as between reliability and purchase intention (H10) in Uzbek e-commerce.

The results of this study imply that Uzbek ecommerce customers are more concerned with how the PU of a particular e-commerce platform can increase their productivity than with the PEOU of that platform. Therefore, to increase sales, e-commerce platforms should devise more creative ways of helping customers to save time and shop more efficiently rather than simplifying their services. The easier it is for users to access e-commerce platforms, the greater the chance that they will use the platforms to shop (Lee & Lee, 2020). E-commerce platforms' website design quality is critical for driving traffic, website retention rates, and actual purchase. It also implies that businesses should provide high-quality experiences to attract customers to their websites (Lan et al., 2021).

Uzbek customers tend not to care about how promptly an e-commerce retailer responds to their queries. This may be explained by providing a detailed website design so that a customer does not need to interact with a service provider. These findings align with the earlier literature that supports responsiveness not affecting customer satisfaction (Lan *et al.*, 2021). In addition, e-commerce users want to feel secure regarding privacy protection and transaction safety. Therefore, stating and abiding by clear privacy policies may lead to greater customer satisfaction (Kim, 2020). Customers who are more satisfied with an e-commerce retailer's performance are more likely to have purchase intentions and actual purchases.

As shown in Table 4, the percentage of goods bought at e-commerce platforms gradually grew from 2018 to 2020. In fact, in 2018, almost 80% of respondents used e-commerce platforms to buy less than 20% of their purchases, but in 2020 nearly 30% of respondents answered the same. Therefore, this study demonstrates that purchases on e-commerce platforms increased year to year in Uzbekistan. Moreover, 68% of respondents agreed that their purchasing frequency via e-commerce platforms was affected by COVID-19. Thus, COVID-19 significantly impacted the development and acceptance of e-commerce platforms in Uzbekistan. As shown in Tables 2, 3, and 4, survey results also provide the importance of managing several sales channels when managing e-commerce in Uzbekistan. Managers should focus on using a multi-channel retailing strategy, the wider the variety of goods that e-commerce platforms can offer, and retailers might provide a more detailed description on their platforms so that customers are not confused and/or reduce returns.

A. Implications of the Study Results

Examining online customer behavior requires continuous attention from academic scholars and industry practitioners. The results of the study provide the following academic values. First, in the context of the Industry 4.0 era, this study uses the TAM to assess technology acceptance in Uzbekistan. Since the current e-commerce market in Uzbekistan is just emerging, the initial model was used in this study. This study expands the TAM by showing that although the world is rapidly changing, the initial TAM or other later models may still be used depending on the areas and/or countries they are applied to. Second, Uzbekistan is a developing country with great potential; however, until recently, little research has been conducted on the Uzbek e-commerce market. Since 2018 the number of e-commerce-related papers has been rising, but most papers are review articles (Islamov & Isokhujaeva, 2021). They give a general overview of the e-commerce market or criticize the e-commerce market by providing opinions for future development. From this perspective, this study fills this gap by analyzing the relationship between service quality, technology acceptance factors, customer satisfaction, and purchase intention by applying the initial TAM model.

Regarding this study's practical implications, findings and implications of the study may allow e-commerce retailers in Uzbekistan to deepen their understanding of both the positive factors and hindrances to develop strategies for attracting more customers. According to this paper, Uzbek e-commerce users are not interested in the retailers' responsiveness, while website design significantly influences customer satisfaction and purchase intention. Therefore, rather than quickly responding to a customer's query and showing a keen interest in resolving their problem, retailers should put more effort into developing valuable and reliable website designs. In short, e-commerce retailers should design and continuously enhance their websites to fulfill customer needs. Hence, companies should build attractive e-commerce platforms to attract and retain customers. Therefore, the results of this study provide practical guidelines for Uzbek e-commerce retailers to deepen their understanding of the factors needed to develop business operational strategies for attracting more

B. Limitations and Future Study

customers and ensuring market survival.

This study has several limitations. First, the TAM has been modified several times to cover broader sectors of technology acceptance and reflect customer needs based on changes in technology. However, this study used the initial TAM to suit the context of Uzbekistan, which lacks sufficient Internet connection and other IT commodities. Over time, other more developed TAM models may be used in the Uzbek market to obtain a more precise overview. Second, since the sample was collected in Uzbekistan, the results may lack generalizability to other countries due to cultural differences in purchasing behaviors. Thus, future studies should compare the Uzbek e-commerce industry to other developing countries with different cultures to provide cross-cultural comparisons. Third, service quality was measured only with website design, responsiveness, and reliability, so it is necessary to add more dimensions (e-payment system, return service, logistics solution) for better quality measurement. Therefore, based on the study's limitations, future research should analyze and find alternative ways for Uzbekistan's e-commerce promotion and development.

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