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The Influence of User Experience, E-Service Quality, and Supply Chain on User Satisfaction Mediated by Platform Usability

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ABSTRACT
Maintaining user satisfaction of FMCG companies' online shopping platforms is a crucial thing that must be done as part of maintaining the competitiveness of the platform. So understanding the factors that can increase user satisfaction is an important issue that must be understood by the platform provider. FMCG companies' online shopping platforms are committed to continuously improving performance and user satisfaction, which is reflected in fluctuations in Order Fulfillment Rate (OFR) during 2022-2024. Although there are improvements in performance and satisfaction, OFR is still below the target. This study aims to analyze the influence of user experience, e-service quality, and supply chain management on platform user satisfaction in FMCG companies with the mediating role of platform usability. This research is expected to help platform providers understand the key factors that influence user satisfaction and improve platform competitiveness. Researchers used quantitative methods by involving 460 users of FMCG companies' online shopping platforms as respondents. This study uses SEM-AMOS analysis technique to answer the hypothesis. The results of the analysis show that user experience, e-service quality (E-S-Qual), and supply chain management significantly affect platform usability. platform usability, user experience, E-S-Qual and supply chain management also significantly affect user satisfaction. platform usability is proven not to mediate the relationship of user experience and supply chain management to user satisfaction, but is significant in mediating the relationship of E-S-Qual to user satisfaction. This research is to see the contributing influence of how important user experience, e-service quality, and supply chain management are on user satisfaction.

Keywords: user experience, e-service quality, supply chain management, platform usability, customer satisfaction.

INTRODUCTION

e-commerce has been the subject of research and analysis for several years. The evolution of the Internet has created new business opportunities and changed the shopping habits of customers around the world, who have shifted from traditional physical stores to online shopping platforms (Achadi et al., 2021; Lim & De Run, 2022; Nwankwo & Ayoade, 2022; Smith & Brown, 2019; Witi, 2021). The outbreak of the 2019 coronavirus disease (COVID-19) pandemic has resulted in an unprecedented surge in global online traffic, causing significant changes in consumer behavior (UNCTAD, 2020). e-commerce proved to be a highly effective shopping solution during the period of self-isolation. According to the latest statistics, user penetration is projected to increase to 63.1% by 2025 (Statista, 2020), while online sales are expected

to reach $6.54 trillion by 2022 (Statista, 2020). A survey conducted in Indonesia revealed that online purchases experienced a 100% surge in 2020 compared to 2019, and nearly half of all Internet users in Indonesia also do online shopping (Katadata, 2023). The use of e-commerce applications in Indonesia continues to increase, according to data (Use of e-commerce in Indonesia 2017-2023) shows that the use of e-commerce applications in Indonesia reached 189.6 million people by 2023. This figure reflects the significant growth in e-commerce adoption among Indonesians, driven by the development of digital technology and increased internet access. This phenomenon indicates a major shift in consumer shopping habits that are increasingly shifting from traditional methods to online platforms. This growth also shows great potential for e-commerce businesses in Indonesia to continue to expand and cater to a wider customer base.

The use of e-commerce in Indonesia is the second largest in ASEAN after Singapore to reach 25-30 billion USD (Katadata, 2023), its rapid growth has been accompanied by business practices that enable electronic transactions and create a user-friendly digital environment (Kala et al., 2024; Solmaz & Van Gerven, 2022, 2023). Along with the highest position as the largest market, Indonesia also faces the problem of high dissatisfaction from consumers reaching 45% as shown in Figure 2 This data is a proof of note for e-commerce service providers to continue to evaluate their customer satisfaction.

Online customer satisfaction in Indonesia can be further improved if the perceived quality and responsiveness meet their needs and expectations. Customer satisfaction is an important factor that indicates the likelihood of a customer experiencing positive feelings from a particular service. However, achieving and maintaining customer satisfaction remains a significant challenge in the e-commerce industry (Cao et al., 2003).

Customer satisfaction is highly dependent on service quality, and customers are more likely to be satisfied when they receive high-quality services. Several theories have been used to explain customer satisfaction (Butt et al., 2021; Gunawan, 2022; Hallencreutz & Parmler, 2021). Among these theories, Expectancy-Disconfirmation Theory (EDT) has gained wide acceptance as a theoretical framework that explains the impact of perceived discrepancies between expectations and actual experiences on customer satisfaction. When applied to e-commerce, EDT can provide insight into the relationship between service quality, user experience (UX), and customer satisfaction.

Service quality and e-service quality have been researched extensively in recent years, as both have been found to impact the economic performance of firms (Kim & Lennon, 2017). E-service quality, in particular, has been identified as the most crucial factor in the success of e-retailers. It is a subjective concept that is influenced by several factors, such as personal and cultural values. Improving service quality can reduce the likelihood of customer dissatisfaction, which can reduce financial and human costs. In addition, it also has a positive impact on perceived value and customer satisfaction, leading to purchase intentions and repeat purchases (Ataburo et al., 2017). Furthermore, e-service quality allows customers to compare technical aspects of products and prices online at no cost (Dhingra et al., 2020; Lee et al., 2022; Nitika Aggarwal, 2023). Several scales have been developed to measure e-service quality, with E-S-QUAL by Parasuraman et al. (2005) being one of the most popular and widely used.

The next factor that affects customer satisfaction is user experience (UX). UX refers to all aspects of a user's interaction with a product, service, environment, or facility. Research on UX has increased substantially in recent years as it becomes a major concern in designing strategic plans for online retailers.

UX encompasses the sensations users get when interacting with a product, as well as the satisfaction and pleasure they derive from its use (2015). UX has been identified as one of the most significant research challenges for the future (Institute, 2016). Although the concept of UX has been studied in many contexts, limited research has been conducted on its application in e-commerce. Moreover, to the best of our knowledge, although previous studies have explored the relationship between customer satisfaction and UX and e-service quality, research examining the combined effects of UX and e-service quality on customer satisfaction is still in its infancy (Dalbehera, 2020; Farooq et al., 2018).

Customer satisfaction (CS) is a marketing technique that focuses on customer behavior after they have purchased a product or service. It is based on product quality and how effectively the supply chain (SC) functions. However, a major source of customer dissatisfaction arises when they cannot find a balance between supply chain sustainability (CS), delivery time, product cost, and the quality of the delivered product. CS is examined in terms of comparing expectations and performance from the product to the customer, in accordance with the Expectation Disconfirmation Theory (EDT). When there are no expectations, the Value-Percept Theory (VPT) considers the client's satisfaction and dissatisfaction after purchasing the product.

The relationship between user experience, e-service quality, and supply chain management to user satisfaction can be insignificant in some cases, especially when technical problems and network disruptions occur on the platform. For example, even though user experience and e-service quality are good, if the system often experiences technical problems or network disruptions, it can reduce the level of user satisfaction. The need for mediating variables in this model can be explained through the Stimulus-Organism-Response (SOR) model, where a stimulus, such as user experience, e-service quality, and supply chain management, must go through an internalization process by the organism (user) before producing a response, namely user satisfaction. In certain cases, this stimulus may not directly result in user satisfaction if obstacles occur, such as technical glitches or network problems. Therefore, a mediating variable is needed that functions as an organism in the SOR model, which processes the impact of the stimulus and ensures that the resulting response is user satisfaction. This mediating variable makes the model more comprehensive, by explaining that the influence of external factors on user satisfaction depends on the internal processes that occur within the user (Dalbehera, 2020; Farooq et al., 2018).

Lavie and Tractinsky (2004) suggest that the visual aesthetics of computer interfaces are a strong determinant of user satisfaction and enjoyment, where classic aesthetic dimensions are strongly associated with perceived usability. Ensuring platform usability on shopping platforms is becoming increasingly important to increase user satisfaction. Shopping websites are more complex compared to others, and design elements can affect customer satisfaction. Customer satisfaction is critical to a company's long-term success and profitability. Since shopping websites have a more significant impact on customer satisfaction than information-focused platforms, it is important to understand how design elements and stimulation (user experience, e-service quality, and supply chain management) can mediate increased customer satisfaction. The web design field is increasingly recognizing that user needs go beyond usability and practicality, towards more experience-related aspects.

One of the FMCG Online Shopping Platform providers, which is included in the top 20 Selected Brands in the fast moving consumer goods (FMCG) sector in Indonesia in 2020, took a strategic step by developing their own e-commerce platform called FMCG company online shopping platform. As one of

the major players in the FMCG industry, the provider company sees great potential in expanding their reach through digital platforms. With the launch of the FMCG enterprise online shopping platform, the provider company hopes to provide an easier and more convenient shopping experience for its consumers, while strengthening its position in the market. FMCG companies' online shopping platforms not only enter the e-commerce market, but also compete with other large e-commerce (Katadata, 2023). Competition in this market is fierce, given the dominance of these big players who already have a wide user base and strong infrastructure. To be able to compete, FMCG companies' online shopping platforms must offer unique added value so that their consumers feel satisfied.

The purpose of this research is to analyze the strategies and competitive advantages employed by the FMCG online shopping platform provider to strengthen its position in the highly competitive Indonesian e-commerce market. This study aims to identify key factors that contribute to consumer satisfaction and loyalty, as well as how the platform differentiates itself from major competitors. The implications of this research for FMCG companies, understanding the successful strategies behind the platform's growth can inform better decision-making in digital transformation efforts and competitive positioning.

RESEARCH METHOD

This research is quantitative research because the data collected and presented in numerical and descriptive form. Quantitative methods emphasize objective measurements and statistical, mathematical, or numerical data analysis. Through this method, researchers can describe the characteristics of the variables studied based on existing data (U. dan R. B. Sekaran, 2020).

Population is the entire group or collection of individuals who are the object of research and have certain characteristics that the researcher wants to study. The population includes all members of the group, so the data representation is thorough and comprehensive. The sample is part of the population selected to represent the entire population in the study. Samples are used to make estimates or generalizations about the population. Proper sample selection is essential to ensure that research results are reliable and applicable to the entire population (Creswell & Creswell, 2017). Next, to ensure that the sample size can represent the population, this study uses the 10-times sample method (Hair Jr et al., 2016) as follows.

η = (many paths + many indicators) x 10
η = (7 + 38) x 10
η = 450

Description:
η = Number of samples

Based on the results of the minimum sample calculation using the 10-times method equation, it can be concluded that the minimum number of samples used is 450 users of the FMCG company's online shopping platform.

Sampling and Data Collection Methods

The sampling method used in this research is non-probability puposive sampling where all people do not have the same opportunity to become research respondents with certain criteria (U. Sekaran & Bougie, 2016). These criteria include the following:

1. The sample used is that the respondent must have an FMCG company online shopping platform account.
2. Have ever made a transaction on the platform

The aim is that respondents can provide an accurate assessment due to their experience. The type of data for this research is primary data collected using a questionnaire distributed online using google form.

This researcher presents the results of a study involving 460 respondents, consisting of both store owners and users of online shopping platforms in the Fast-Moving Consumer Goods (FMCG) category. This number of respondents has met, and even exceeded, the minimum research sample limit of 460 respondents. The analysis in this chapter includes observations on a number of key variables, namely e-service quality, user experience, supply chain management, platform usability, and customer satisfaction. The results obtained are described in detail, followed by an in-depth discussion to understand the relationships between variables and their implications for the management of FMCG online shopping platforms.

RESULT AND DISCUSSION

SEM-AMOS Results

Interpretation of SEM-AMOS results is done through several stages to ensure the research model meets the necessary criteria. These stages include measurement model evaluation to test validity and reliability, normality and outlier analysis as basic assumption prerequisites, goodness of fit assessment to assess the overall fit of the model, and hypothesis testing to identify significant relationships between variables. This approach enables comprehensive and in-depth analysis of research data (Hair Jr et al., 2016).

Construct Validity and Reliability

Convergent validity is used to assess the extent to which the indicators in one construct are actually able to measure the construct. The measure used is Average Variance Extracted (AVE), with a cut-off value ≥ 0.50. The AVE value is obtained from the loading factor value. However, if the AVE value is below 0.50 but the Composite Reliability (CR) value is more than 0.60, the construct is still acceptable. This happens because there is a fairly high loading factor value (> 0.50 but < 0.70), which can cause the AVE to be relatively low but still reflect adequate reliability. This study uses a standard loading factor> 0.6 (Hair Jr et al., 2016). Construct reliability, which reflects the internal consistency of indicators in measuring constructs, is evaluated through CR with a cut-off value ≥ 0.70, although values ≤ 0.70 are acceptable in exploratory research. A good level of reliability indicates that the indicator has consistency in its measurement, providing confidence that the instrument used can be relied upon to produce accurate results. This evaluation of validity and reliability provides a strong basis for continuing the model analysis, ensuring that the data used is of sufficient quality to support the interpretation of the research results in the context of the theoretical model being tested. The following are the results of the convergent validity test in this study.

Table 1. Validity and Reliability of e-service quality

Variable	Dimensions	Loading Factor	Indicator	Loading Factor	C.R	AVE
e-service quality (E-S-QUAL)	Efficiency	0.789	E-S-QUAL1 This platform makes it easy for me to find what I want.	0.740	0.944	0.633
			E-S-QUAL2 The platform makes it easy for me to reach any part of the site.	0.753		
			E-S-QUAL3 This platform allows me to complete transactions quickly.	0.869		
			E-S-QUAL4 The platform is always available for business.	0.795		
	Fullfilment	0.714	E-S-QUAL5 The platform is up and running immediately.	0.905		
			E-S-QUAL6 The platform does not crash.	0.523		
	System availability	0.8275	E-S-QUAL7 The company delivers orders as promised from this platform.	0.815		
			E-S-QUAL8 The company makes goods available for delivery within the appropriate timeframe.	0.840		
	Privacy	0.826	E-S-QUAL9 The platform protects information about my web shopping behavior	0.850		
			E-S-QUAL10 This Platform does not disclose my personal information to other parties.	0.802		

Source: Primary data processed, 2024

Based on Table 1, the measurement of e-service quality (E-S-QUAL) constructs mostly shows good validity based on the loading factor and AVE values. Overall, the AVE value of 0.633 and Composite Reliability (CR) of 0.944 indicate that the E-S-QUAL construct has good internal consistency and convergent validity. At the indicator level, there is one indicator that does not meet the validity criteria, namely E-S-QUAL6 (This platform does not crash), with a loading factor value of 0.523, which is below the cut-off limit ≥ 0.60. This indicates that this indicator is not strong enough to represent the Fulfillment dimension of the E-S-QUAL construct. Therefore, E-S-QUAL6 should be removed from the model to improve the measurement quality of the Fulfillment dimension and the overall construct. In contrast, other indicators, such as E-S-QUAL3 (0.869) in the Efficiency dimension and E-S-QUAL5 (0.905) in the Fulfillment dimension, have excellent loading factor values, indicating a significant contribution in measuring their respective dimensions. Thus, although in general this construct is valid and reliable, it needs improvement by removing invalid indicators such as E-S-QUAL6.

The e-service quality (E-S-QUAL) construct consists of four main dimensions, namely Efficiency, Fulfillment, System Availability, and Privacy, each of which has important meaning if valid. The Efficiency dimension reflects the extent to which the platform makes it easy for users to find their needs, browse the site, and complete transactions quickly. Valid indicators such as E-S-QUAL3 indicate that the platform can provide an efficient experience, which is an important aspect in improving customer satisfaction. Fulfillment measures the platform's ability to fulfill promised services, such as timely delivery of goods. The valid indicator E-S-QUAL5 indicates the reliability of the platform in providing services, although E-S-

QUAL6 is considered invalid because the loading factor value is <0.60, so it needs to be removed from the model. The System Availability dimension assesses the reliability of the system in providing services at the promised time, with indicators such as E-S-QUAL7 showing customer confidence in the consistency of the platform. Privacy, as the last dimension, measures the platform's ability to protect users' personal information. Indicators such as the valid E-S-QUAL9 show that the platform is able to keep customer data safe, which is important for building loyalty. Overall, the valid dimensions indicate that the platform has high service quality, while the invalid indicators need to be reviewed to improve the accuracy of the measurement.

Table 2. Validitas dan Reliabilitaas user experience

Variable	Dimension	Loading Factor	Indicator	Loading Factor	C.R	AVE
user experience (UX)	Attractiveness	0.847	UX1 This platform is fun.	0.880	0.966	0.740
			UX2 The platform is good.	0.813		
	Perspiculty	0.854	UX3 The navigation on this platform is understandable.	0.868		
			UX4 Navigation on this platform is easy to learn.	0.839		
	Dependebility	0.851	UX5 Navigation on this platform is predictable.	0.822		
			UX6 The navigation on this platform is supportive.	0.879		
	Stimulation	0.883	UX7 This platform is valuable.	0.886		
			UX8 The platform is interesting.	0.880		
	Novelty	0.867	UX9 The design of this platform is creative.	0.869		
			UX10 The design of the platform is original and up-to-date.	0.864		

Source: Primary data processed, 2024

The user experience (UX) dimension is important, as it reflects the quality of the user experience of the platform. Attractiveness reflects the visual appeal and perceived enjoyment of the user, so the validity of this dimension indicates that the platform is able to provide an attractive and enjoyable experience overall. Perspicuity measures the extent to which the platform is easy to understand and learn; the validity of this dimension indicates that the platform is intuitive and user-friendly, making navigation easy for both new and repeat users. Dependability reflects the reliability and predictability of navigation on the platform; if valid, it indicates that users feel confident in the platform's consistency in supporting their needs. Stimulation measures the extent to which the platform provides value and emotional appeal; its validity indicates that users feel positively motivated and stimulated when using the platform. Finally, Novelty reflects the creativity and innovation of the platform's design; the validity of this dimension signifies that users value fresh and unique designs, which provide new and exciting experiences. If all dimensions are valid, the platform can be considered to provide an optimal and high-quality user experience.

The results in Table 2 show that the measurement consists of five main dimensions, namely Attractiveness, Perspicuity, Dependability, Stimulation, and Novelty, all of which have good validity and reliability. Overall, the Composite Reliability (CR) value of 0.966 and Average Variance Extracted (AVE) of 0.740 indicate high internal consistency and excellent convergent validity. The Attractiveness dimension reflects users' attractiveness and enjoyment of the platform, with indicators such as UX1 (This platform is fun) having a loading factor of 0.880. The Perspicuity dimension assesses the ease of navigation of the platform, indicated by indicator UX3 (Navigation on this Platform is understandable) with a loading factor of 0.868. Dependability reflects the reliability of navigation, such as indicator UX6 (Navigation on this Platform is supportive) which has a loading factor of 0.879. Stimulation indicates the extent to which the platform provides value and appeal, represented by UX7 (This platform is valuable) with a loading factor of 0.886. Meanwhile, Novelty assesses the creativity and innovation of the platform's design, with indicators such as UX9 (The platform's design is creative) having a loading factor of 0.869. With all indicators meeting the criteria for validity (loading factor ≥ 0.60) and reliability (CR ≥ 0.70), these results indicate that the platform provides a very positive user experience, both in terms of attractiveness, ease of use, reliability, stimulation, and design innovation.

Outlier and Normality Test

At this stage of the analysis, several tests were conducted to ensure that the data met the basic assumptions underlying the model, including normality and outlier tests. The outlier test is conducted at two levels: univariate and multivariate. The univariate outlier test aims to evaluate whether there are observations that are significantly different from other values in each variable individually, while the multivariate outlier test is used to identify patterns of extreme values in combinations of variables, which may affect the overall stability of the model. Furthermore, a normality test was conducted to measure the extent to which the distribution of data approximates a normal distribution, which is an important assumption in many statistical methods, including SEM. In addition, a collinearity test was conducted to ensure that there is no significant linear relationship between the independent variables, which may affect the accuracy of the interpretation of the model parameters. The results of these tests provide a strong basis for ensuring that the data used are reliable and valid, thus supporting the continuation of analysis and hypothesis testing in the next stage. This stage is a critical step in validating the data before proceeding to the structural model analysis.

Outliers are observational data that have different unique characteristics and appear in extreme forms (Hair Jr et al., 2016). Outlier data appears in univariate and multivariate forms. Univariate outlier testing can be done by looking at standard score (Z-Score) conversion data which has an average value of 0 and a standard deviation of 1. The model is said to have univariate outliers if the minimum and maximum values are at the threshold □ 4. The following is the univariate outlier test data

Table 3. Univariate Outlier Assumption Test

	Minimum	Maximum
Zscore(ESQUAL1)	-3.51456	1.28632
Zscore(ESQUAL2)	-3.41883	1.48043
Zscore(ESQUAL3)	-3.50371	1.29304
Zscore(ESQUAL4)	-3.41620	1.37481

	Minimum	Maximum
Zscore(ESQUAL5)	-3.25921	1.44059
Zscore(ESQUAL7)	-3.42956	1.28673
Zscore(ESQUAL8)	-3.26588	1.33184
Zscore(ESQUAL9)	-3.39929	1.44931
Zscore(ESQUAL10)	-3.38267	1.35050
Zscore(UX1)	-3.72071	1.46181
Zscore(UX2)	-3.06083	1.33796
Zscore(UX3)	-3.66697	1.46790
Zscore(UX4)	-3.58914	1.47141
Zscore(UX5)	-3.31261	1.70402
Zscore(UX6)	-3.82883	1.47218
Zscore(UX7)	-3.21237	1.47000
Zscore(UX8)	-3.07668	1.45918
Zscore(UX9)	-3.65217	1.50515
Zscore(UX10)	-3.70975	1.56532
Zscore(SCM1)	-2.73608	1.54122
Zscore(SCM2)	-2.88351	1.62427
Zscore(SCM3)	-3.74777	1.35275
Zscore(SCM4)	-2.96945	1.68058
Zscore(SCM5)	-3.39464	1.50045
Zscore(SCM6)	-3.53636	1.53132
Zscore(SCM7)	-3.85689	1.31185
Zscore(SCM8)	-3.32721	1.44447
Zscore(PU1)	-3.78903	1.46875
Zscore(PU2)	-3.59897	1.41019
Zscore(PU3)	-3.44615	1.42025
Zscore(PU4)	-3.66945	1.48852
Zscore(PU5)	-3.42244	1.52437
Zscore(PU6)	-3.33515	1.59787
Zscore(PU7)	-3.44205	1.48281
Zscore(CS1)	-3.78869	1.49652
Zscore(CS2)	-3.51468	1.42197
Zscore(CS3)	-3.96930	1.34621

Based on the results of the univariate outlier assumption test in Table 3, it is known that the minimum and maximum values of each indicator are at the threshold 4. So it can be ascertained that the data used is free from univariate outliers. Furthermore, multivariate outlier testing (Table 3) can be done by looking at the mahalanobis distance at a probability of 0.001 and a degree of freedom (df) of a number of parameters in this study or 655. The mahalanobis distance of X2 p=0.001, df=655 is 772.569 so that if the value is above the mahalanobis distance it can be said to be a multivariate outlier. The following are the results of multivariate outlier processing

Table 4. Multivariate Outlier Assumption Test

Observation number	Mahalanobis d-squared	p1	p2
7	183,476	,000	,000
5	182,583	,000	,000
23	181,919	,000	,000
.	.	.	.

Observation number	Mahalanobis d-squared	p1	p2
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
16	56,554	,027	,000
110	56,451	,027	,000
311	56,451	,027	,000

Data normality is an important requirement that must be met in modeling using SEM, with the aim of knowing the distribution of research data. To determine the normality of the data, it can be seen from the skewness and kurtosis values and by observing the data distribution curve. SEM requires the fulfillment of the normality assumption, the test used is to observe the skewness and kurtosis value coefficients of the data used and presented in descriptive statistics. The statistical value used to test data normality is the critical ratio value (c.r.) Data is normally distributed univariate if the critical ratio value (c.r.) of skewness and kurtosis is between -2.58 and 2.58 (± 2.58). Data is said to be multivariate normally distributed if its multivariate value is smaller than 10. The results of the data normality test in this study are as follows:

Table 5. Data Normality Test

Variable	min	max	skew	c.r.	kurtosis	c.r.
ESQUAL6	1,000	5,000	0,128	0,874	-0,233	-0,793
CS1	1,000	5,000	0,226	1,541	-0,291	-0,992
CS2	1,000	5,000	-0,261	-1,777	-0,379	-1,293
CS3	1,000	5,000	0,069	0,469	-0,245	-0,835
PU1	1,000	5,000	-0,13	-0,889	-0,139	-0,475
PU2	1,000	5,000	-0,033	-0,228	0,483	1,647
PU3	1,000	5,000	-0,37	-2,525	-0,362	-1,235
PU4	1,000	5,000	-0,492	-2,354	-0,061	-0,207
PU5	1,000	5,000	0,089	0,608	-0,43	-1,467
PU6	1,000	5,000	-0,394	-2,289	-0,185	-0,631
PU7	1,000	5,000	0,52	2,549	-0,874	-1,98
SCM1	1,000	5,000	-0,37	-2,521	0,236	0,805
SCM2	1,000	5,000	0,07	0,477	-0,219	-0,746
SCM3	1,000	5,000	-0,998	-2,491	0,879	2,362
SCM4	1,000	5,000	-0,453	-2,089	0,857	2,308
SCM5	1,000	5,000	-0,176	-0,3	-0,157	-1,246
SCM6	1,000	5,000	0,065	0,444	0,066	0,225
SCM7	1,000	5,000	-0,163	-1,115	-0,494	-1,686
SCM8	1,000	5,000	-0,121	-0,827	-0,344	-1,172
ESQUAL1	1,000	5,000	-0,243	-1,656	-0,347	-1,183
ESQUAL2	1,000	5,000	-0,001	-0,006	-0,37	-1,263
ESQUAL3	1,000	5,000	-0,173	-1,18	-0,038	-0,129
ESQUAL4	1,000	5,000	0,118	0,865	-0,221	-0,712
ESQUAL5	1,000	5,000	0,225	1,567	-0,243	-0,932
ESQUAL7	1,000	5,000	-0,221	-1,754	-0,344	-1,342
ESQUAL8	1,000	5,000	0,064	0,345	-0,213	-0,832
ESQUAL9	1,000	5,000	-0,12	-0,768	-0,11	-0,412

Variable	min	max	skew	c.r.	kurtosis	c.r.
ESQUAL10	1,000	5,000	-0,043	-0,211	0,465	1,675
UX1	1,000	5,000	-0,365	-2,453	-0,322	-1,243
UX2	1,000	5,000	-0,443	-2,234	-0,054	-0,276
UX3	1,000	5,000	0,045	0,566	-0,422	-1,444
UX4	1,000	5,000	-0,387	-2,566	-0,197	-0,654
UX5	1,000	5,000	0,546	2,455	-0,789	-1,643
UX6	1,000	5,000	-0,021	-0,311	0,455	1,602
UX7	1,000	5,000	-0,354	-2,323	-0,386	2,150
UX8	1,000	5,000	-0,465	-2,341	-0,099	1,894
UX9	1,000	5,000	0,073	0,511	-0,432	2,101
UX10	1,000	5,000	-0,354	-2,523	-0,391	1,871
Multivariate					25,188	7,894

Based on Table 5, it is known that univariate data is normally distributed and multivariate data is also normally distributed.

Collinearity Test

Collinearity arises when two or more independent variables in a regression model are correlated. A little multicollinearity can sometimes cause major problems with the relationship of the variables but if the relationship is too high it is also a problem because the variables may be identical. Collinearity or non-linear dependence is a statistical phenomenon in which two or more predictor variables in the model are highly correlated. Predictor variables are said to have a high correlation if they have a correlation value> 0.9. The following are the results of the collinearity test analysis in this study.

Table 6. Collinearity Test

			Estimate
User_Experience	<-->	E_Service_Quality	,818
Supply_Chain_Management	<-->	E_Service_Quality	,873
Supply_Chain_Management	<-->	User_Experience	,817

Table 6. shows that the correlation value between variables is smaller than 0.9 so it can be concluded that there are no symptoms of collinearity in this study.

Construct Model Analysis Test

Figure 6 shows the construct model of the research as a whole (measurement model analysis, structural model analysis and hypothesis testing). A construct cannot be said to be good if it does not meet the goodness of fit criteria. Goodness-of-Fit measures the suitability of observed or actual input (covariance or correlation matrix) with predictions from the proposed model. There are four types of Goodness-of-Fit measures, namely

1. Basic goodness of fit
2. Absolute fit indices
3. Incremental fit indices
4. Parsimonious fit indices.

Goodness of fit is a basic indicator to assess the feasibility of the model. Basic goodness of fit includes Chi-square (X^2) and degrees of freedom as the basis for model measurement. Absolute fit

measures are used to measure the overall fit of the model (both structural and measurement models), including Chi-square (X^2), Goodness of Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA). Incremental fit indices compare the proposed model with alternative models, including Adjusted Goodness of Fit Index (AGFI), Norm Fit Index (NFI), Comparative Fit Index (CFI), Incremental Fit Index (IFI), and Relative Fit Index (RFI). Parsimonious fit indices customize fit measures for models with different numbers of parameters, including Akaike's Information Criterion (AIC), Consistent Akaike Information Index (CAII), Expected Cross Validation Index (ECVI), Parsimonious Normal Fit Index (PNFI), and Parsimonious Goodness of Fit Index (PGFI).

The influence of user experience on platform usability

Hypothesis 1, user experience (UX) has a positive and significant effect on platform usability (β = 0.574; T = 11.356; p = ***), indicating that user experience significantly improves platform usability. The results of this study are in line with previous research which states that user experience has a positive effect on platform usability.

User experience (UX) has a significant influence on platform usability, especially in the context of online shopping, because UX covers all aspects of user interaction with the platform. These aspects include interface design, navigation, responsiveness, and system stability. When users feel comfortable, happy, and efficient in using a platform, they tend to rate it as usable. This positive experience is often driven by intuitive UX design, such as a clean layout, clear navigation processes, and the speed and reliability of the platform when accessed. Good website design, as described by Nguyen et al. (2021), plays an important role in creating a positive UX. Visual elements, navigation, and information are at the core of the user experience. An attractive visual design enhances the appeal of the platform, structured navigation makes it easier for users to navigate through different parts of the site, and accurate and organized information helps users make decisions quickly. These three elements support the functionality, structure, and content of the website, ultimately shaping the perceived usability of the platform.

Users often look for ease and speed in finding products, comparing prices, and completing transactions. Good UX supports these needs through features such as effective product search, a simple checkout process, and a layout that makes it easy for users to understand information. Conversely, poor UX-such as a confusing interface or complicated transaction process-can lower the perception of a platform's usability, even if the platform actually offers quality products or services. Thus, UX design that focuses on user needs and convenience not only improves the efficiency of user interactions with the platform but also creates the perception that the platform is easy to use. Therefore, the justification that user experience has a positive influence on platform usability is strong, supported by various design elements and platform functions that are integrated to meet user expectations.

Effect of E-S-Qual on platform usability

The second hypothesis (H2), which states that E-S-Qual has a positive and significant effect on platform usability (β = 0.211; T = 3.748; p = ***), indicates that electronic service quality supports platform usability. The results of this study are in line with previous research which states that -service quality has a positive influence on platform usability. E-service quality has a direct influence on platform usability because good service can create a smoother, more efficient, and satisfying user experience. According to,

e-service quality includes important aspects such as system reliability, efficiency, privacy, and responsiveness to user needs. These aspects play an important role in influencing user interaction with the platform. When e-service quality is high, the platform can provide a reliable, fast, secure, and responsive experience. For example, users who can easily find accurate product information, complete transactions quickly, and feel secure that their personal data is protected rate the platform as usable.

Conversely, if e-service quality is poor, such as frequent system glitches, inaccurate product information, or slow transaction processes, this can cause frustration in users and lower their perception of platform usability. Therefore, good e-service quality improves users' perception of platform usability, as responsive and reliable services support users' needs effectively and efficiently. Ultimately, this not only improves usability but also creates user satisfaction and loyalty towards the platform. The dimensions of e-service quality, efficiency, fulfillment, system availability, and privacy have a significant influence on platform usability by complementing each other in creating an efficient and satisfying user experience. Efficiency contributes to usability by ensuring users can complete tasks, such as finding products or completing transactions, quickly and without difficulty. Efficient processes, such as intuitive navigation and responsive search features, make users find the platform easy to use. Fulfillment, on the other hand, focuses on the platform's ability to fulfill promises to users, such as product availability and timely delivery. When users feel that the platform can be relied upon to fulfill their needs without any problems, the perception of the platform's ease of use increases.

System availability ensures that the platform can be accessed at any time without interruption. A stable and responsive system allows users to carry out their activities without technical hindrance, which is an important aspect of perceived usability. Finally, privacy plays a key role by providing users with a sense of security through the protection of their personal data. When users feel that their information is safe and not being misused, trust in the platform increases, which strengthens the perceived ease and comfort of using the platform. Thus, these four dimensions collectively support the perception that the platform has high usability, making e-service quality a key driver in creating a positive and efficient user experience.

The influence of supply chain management on platform usability

The third hypothesis (H3), supply chain management has a positive and significant effect on platform usability (β = 0.221; T = 3.927; p = ***), indicating that good supply chain management contributes to platform usability. The results of this study support previous research. Supply chain management (SCM) has a significant influence on user satisfaction, especially in the context of online shopping. Effective SCM ensures that products are available, on time, of appropriate quality, and at a reasonable cost, all of which contribute to a positive shopping experience. Good SCM ensures that the products desired by users are always available. When users find the products they want easily, without having to wait long or face out of stock situations, this increases their satisfaction. Conversely, product unavailability or late delivery can cause frustration and decrease user satisfaction.

On-time delivery is one of the critical aspects that greatly affects user satisfaction in the context of online shopping. An effective supply chain management (SCM) system plays an important role in optimizing distribution and logistics processes, ensuring products can be delivered quickly and on schedule. When products arrive on time as promised, users feel that the platform meets their

expectations, which directly increases satisfaction with the service. In addition, SCM is also responsible for maintaining product quality throughout the delivery process. Close supervision along the supply chain ensures that the delivered products are not defective or damaged, so users who receive high-quality products are satisfied with their shopping experience. Efficiency in SCM not only improves service quality but also provides economic benefits. By reducing operational costs through optimized supply chain management, platforms can offer more competitive prices to users. Fair and transparent pricing, when combined with high-quality services such as on-time delivery and quality-assured products, becomes a very effective combination in creating a satisfying user experience. Therefore, efficient SCM not only meets logistics needs, but also supports the creation of higher user satisfaction through reliable, quality and economical services.

The dimensions of supply chain management (SCM)-damage-free, defect-free, flexibility, and cost mediation-are interrelated in creating a satisfactory user experience. The damage-free dimension ensures that the delivered products arrive in good condition without any damage during the delivery process. This creates user confidence in the reliability of the platform. Furthermore, defect-free ensures that the products received conform to specifications and are free from defects. The combination of these two dimensions contributes directly to user satisfaction as they receive the product as expected, both in terms of condition and quality. The flexibility dimension adds value by giving the platform the ability to respond to dynamic user needs, such as changes in delivery addresses or order quantities. This flexibility not only improves operational efficiency but also provides a more personalized and satisfying experience for users. Finally, cost mediation, which focuses on cost efficiency along the supply chain, enables the platform to offer competitive prices to users. Reasonable prices, combined with responsive and high-quality services, strengthen users' satisfaction with the platform. Thus, these four dimensions work synergistically to ensure that SCM not only supports platform operations but also directly contributes to user satisfaction and loyalty.

The influence of platform usability on user satisfaction

The fourth hypothesis (H4), platform usability has a positive effect on user satisfaction ($\beta = 0.111$; $T = 1.650$; $p = 0.099$), but shows a weak relationship between platform usability and user satisfaction. The results of this study are in line with previous research. Customer satisfaction is an important metric that reflects a customer's overall experience with a product or service over time. It is a vital indicator of the strength of the relationship between the company and the customer, which consists of five important factors: content, format, accuracy, ease of use, and timeliness. Furthermore, according to Expectation Confirmation Theory (ECT), if customer expectations are met, it results in confirmation and satisfaction. Usability is a key driver of user satisfaction, as users tend to be more satisfied when they feel that the system is easy to use. Tandon et al. (2017) examined the effect of perceived usability on customer satisfaction in online shopping among Indian consumers who were not familiar with the practice and found a significant negative effect. However, they did not investigate the specific factors that influence perceived usability. Usability is likely to have a significant impact on satisfaction in China, where online shopping is very common.

Platform usability in online shopping greatly affects user satisfaction because platform usability determines how easily and efficiently users can complete tasks such as searching for products, comparing

prices, and making transactions. When a platform has high usability, users can navigate the site easily, find the information they need without difficulty, and complete purchases quickly. These positive experiences tend to increase user satisfaction as they feel that the platform supports their needs and expectations well. Users often face a wide choice of online shopping platforms, so they prefer the platform that offers the smoothest and most seamless user experience. For example, if a platform has an intuitive interface, a fast checkout process, and accurate search features, users are more satisfied because they can complete purchases with less effort and without frustration. Conversely, if the platform is difficult to use, for example, with confusing navigation or complicated payment processes, users may feel frustrated and eventually choose to shop elsewhere. Therefore, good platform usability is critical in creating a satisfying shopping experience, which in turn drives customer loyalty and the long-term success of the platform.

The dimensions of platform usability-easy to understand, easy to use, and easy to customize-influence each other in creating a satisfying and efficient online shopping experience. The easy to understand dimension focuses on the extent to which users can quickly understand the structure and functions of the platform. When the information and layout of the platform are intuitively designed, users feel comfortable navigating the site, which is the first step in creating satisfaction. The easy to use dimension complements this aspect by ensuring that processes within the platform run smoothly, such as efficient product searches, simple navigation, and fast checkout processes. Users who find the platform easy to use tend to be more satisfied as they can complete tasks without excessive effort.

The last dimension, easy to customize, gives users the flexibility to customize their experience according to their preferences, making orders anywhere anytime. This capability increases user engagement with the platform, ultimately creating a more personalized and satisfying experience. These three dimensions work synergistically to ensure that the platform is not only easy to use but also able to efficiently fulfill users' needs and expectations. The positive experience resulting from this synergy directly contributes to high levels of customer satisfaction, which in turn supports loyalty and the long-term success of the platform.

The influence of UX on user satisfaction

The fifth hypothesis (H5), that user experience has a positive and significant effect on user satisfaction (β = 0.836; T = 12.318; p = ***), confirms that user experience plays an important role in increasing satisfaction. The results of this study are in line with previous research Filippi & Barattin (2019) which states that user experience has a positive effect on user satisfaction. user experience Questionnaire (UEQ) is very similar to AttrakDiff and focuses on pragmatic and hedonic dimensions. The UEQ includes six dimensions and 26 items and is used as part of usability testing to collect quantitative data on users' impressions of a product. The meCUE scale provides an evaluation of product perceptions, user emotions, consequences of use, and overall judgment. The scale consists of four dimensions and 34 items and has been applied in UX studies on all types of interactive systems (Filippi & Barattin, 2019).

In our empirical study, we used the scale proposed by Laugwitz et al. (2008), which assesses UX based on six factors: attractiveness, clarity, efficiency, reliability, stimulation, and novelty. Attractiveness is a pure valence dimension, while clarity, efficiency, and reliability represent pragmatic/ergonomic quality aspects, while stimulation and novelty represent hedonic quality aspects. A basic requirement for

our study was to use a scale with a balance between pragmatic and hedonic qualities of a system. This instrument provides the necessary balance and was therefore chosen for our study. Previous studies have found a close relationship between usability, UX, and e-service quality. However, despite the mutual relationship, there is still a lack of models explaining the dimensions of these three constructs. Bhattacharya et al. (2012) consider usability as a subset of e-service quality. Nonetheless, most researchers in the community see usability as an important component of UX, although these concepts have different focus areas.

For a long time, usability and other important aspects of UX, such as trust, empathy, attractiveness, reliability/fulfillment, and information quality, have been recognized as key dimensions of e-service quality. UX is considered an important indicator of service quality that affects user satisfaction and experience. In a recent study, Zhou et al. (2019) examined e-service quality from a UX perspective and identified a positive relationship between e-service quality, customer satisfaction, and loyalty. The researchers used UX-related scales to assess e-service quality in the telecommunications industry, which highlighted the close relationship between UX and e-service quality.

The effect of E-S-Qual on user satisfaction

The sixth hypothesis (H6), which states that e-service quality has a positive and significant effect on user satisfaction ($\beta = 0.161$; $T = 2.669$; $p = 0.008$), indicates that e-service quality has an influence on user satisfaction. This finding supports previous research, such as Farooq et al. (2018), which consistently found a positive relationship between e-service quality and user satisfaction. This contradiction can be explained through several contextual factors. One of them is the possibility of a more dominant mediating variable, such as platform usability, which plays an important role in bridging the relationship between e-service quality and user satisfaction. In this context, although e-service quality serves to increase the perceived ease of use of the platform, its effect is not direct on user satisfaction but rather through the user experience at the usability level.

This research shows that e-service quality is an important element, its influence on user satisfaction is always immediately significant. In the increasingly advanced online shopping ecosystem, aspects such as system reliability, service efficiency, and privacy may have become minimum standards that users take for granted. As such, e-service quality is no longer the main differentiating factor affecting satisfaction, but rather other elements such as competitive pricing, service flexibility, or platform usability tend to have a more dominant role. In addition, modern users may be more focused on the overall shopping experience, including interface design, navigation speed, and service personalization. In other words, while e-service quality is important, its impact on user satisfaction may be masked by other factors that more directly influence the user experience of using online shopping platforms. This phenomenon reflects the evolving dynamics of user needs and preferences, emphasizing the need for a holistic approach in understanding user satisfaction.

The effect of supply chain management on User Satisfaction

The seventh hypothesis (H7), which states that supply chain management has a positive and significant effect on user satisfaction ($\beta = 0.195$; $T = 3.202$; $p = 0.001$), shows that good supply chain

management increases user satisfaction. The results of this study are in line with previous research which revealed that supply chain management has a positive effect on user satisfaction.

Supply chain management (SCM) plays a crucial role in addressing inefficiencies along the value chain, from raw material procurement to product delivery to end customers. The main focus of SCM is to optimize various processes in the supply chain to minimize waste, speed up workflow, and improve operational efficiency. With effective implementation of SCM, online stores can reduce operational costs, such as storage and shipping costs, and obtain more competitive prices, which in turn increase the attractiveness for customers.

Good SCM practices strengthen the reputation of online stores by ensuring timely delivery, consistent product quality, and adequate service, building trust and a positive reputation. Efficient SCM also enables businesses to be more flexible in the face of changing markets and consumer demands, support the introduction of new products, and better meet customer needs. These practices contribute to long-term growth by creating operational efficiency and building long-term relationships with suppliers and customers. In addition, efficient integration of SCM principles encourages more responsible practices, such as reduction of wastage and efficient use of resources, which ultimately increases customer satisfaction. Thus, effective SCM not only improves operational efficiency but also strengthens relationships with customers, increases their satisfaction, and encourages loyalty to online stores.

Supply chain management (SCM) has a significant effect on online shopping platform user satisfaction as it is directly related to various aspects of the shopping experience. Efficient SCM ensures consistent product availability, so users do not experience stock shortages when searching for desired items. In addition, good SCM optimizes the logistics process to ensure product delivery on time and in good condition, increasing user trust and satisfaction. Effective supply chain management also helps reduce operational costs, enables platforms to offer competitive and transparent pricing, and ensures that products meet high quality standards. In addition, good SCM supports responsive customer service with prompt handling of issues and product returns. All these factors contribute to a satisfying shopping experience, increase customer loyalty, and strengthen the positive reputation of online shopping platforms.

Mediation function on the relationship between user experience, E-S-Qual, and supply chain management on user satisfaction

The indirect effect or mediation effect in this study was determined through sobel test modeling. The mediation test results (using a significance tolerance level of 0.1) show that platform usability mediates the relationship between user experience and user satisfaction (H8), so the hypothesis is accepted ($T = 1.645$; $p = 0.099$). Mediation of platform usability on the relationship between e-service quality and user satisfaction (H9) is rejected ($T = 1.563$; $p = 0.117$), so this hypothesis is rejected. platform usability is proven not to mediate the relationship between supply chain management and user satisfaction (H10), so the hypothesis is rejected ($T = 1.571$; $p = 0.116$).

Customer satisfaction (CS) is a marketing technique that focuses on customer behavior after they have purchased a product or service. It is based on product quality and how effectively the supply chain (SC) functions. However, a major source of customer dissatisfaction arises when they cannot find a balance between supply chain sustainability (CS), delivery time, product cost, and the quality of the delivered product. CS is examined in terms of comparing expectations and performance from the product

to the customer, in accordance with the Expectation Disconfirmation Theory (EDT). When there are no expectations, the Value-Percept Theory (VPT) considers the client's satisfaction and dissatisfaction after purchasing the product.

The relationship between user experience, e-service quality, and supply chain management to user satisfaction can be insignificant in some cases, especially when technical problems and network disruptions occur on the platform. For example, even though user experience and e-service quality are good, if the system often experiences technical problems or network disruptions, it can reduce the level of user satisfaction. The need for mediating variables in this model can be explained through the Stimulus-Organism-Response (SOR) model, where a stimulus, such as user experience, e-service quality, and supply chain management, must go through an internalization process by the organism (user) before producing a response, namely user satisfaction. In certain cases, this stimulus may not directly result in user satisfaction if obstacles occur, such as technical glitches or network problems. Therefore, a mediating variable is needed that functions as an organism in the SOR model, which processes the impact of the stimulus and ensures that the resulting response is user satisfaction. This mediating variable makes the model more comprehensive, by explaining that the influence of external factors on user satisfaction depends on the internal processes that occur within the user.

Lavie and Tractinsky (2004) suggest that the visual aesthetics of computer interfaces are a strong determinant of user satisfaction and enjoyment, where classic aesthetic dimensions are strongly associated with perceived usability. Ensuring platform usability on shopping platforms is becoming increasingly important to increase user satisfaction. Shopping websites are more complex compared to others, and design elements can affect customer satisfaction. Customer satisfaction is critical to a company's long-term success and profitability. Since shopping websites have a more significant impact on customer satisfaction than information-focused platforms, it is important to understand how design elements and stimulation (user experience, e-service quality, and supply chain management) can mediate increased customer satisfaction. The web design field is increasingly recognizing that user needs go beyond usability and practicality, towards more experience-related aspects.

A good user experience strongly influences perceptions of platform usability. When users find a platform easy to use, intuitive and engaging, they tend to be more satisfied with the overall experience, as such ease and convenience adds value. For example, if someone uses a platform with an attractive design and simple navigation, they find the shopping or usage experience more enjoyable, resulting in increased satisfaction. In this context, platform usability becomes an important link between users' experience and their satisfaction. Hypothesis 9 (platform usability mediates the relationship between e-service quality and User Satisfaction) is rejected because e-service quality is likely to have a direct impact on user satisfaction, without the need to rely on perceived platform usability. For example, if a platform has fast service, on-time delivery, and cost transparency, users are satisfied directly from the service quality, regardless of whether the platform is easy to use or not. In such a situation, although platform usability plays a role, its effect is not significant enough to be a mediator. Hypothesis 10 (platform usability mediates the relationship between supply chain management and User Satisfaction) was also rejected because supply chain management focuses more on aspects of delivery and fulfillment of service promises that affect user satisfaction directly. For example, if the product arrives in good condition, as described,

and on time, users are satisfied regardless of how they experience using the platform. The usability factor of the platform becomes less relevant than supply chain performance in building satisfaction.

CONCLUSION

Based on the results and discussion, this study found that user experience (UX), e-service quality (E-S-Qual), and supply chain management (SCM) have a positive and significant influence on platform usability. An attractive and intuitive UX increases the ease of use of the platform, while reliable e-services and good supply chain management strengthen the perceived usability of the platform. However, platform usability has only a weak positive influence on user satisfaction, suggesting that user satisfaction is more dependent on other factors such as UX and E-S-Qual. UX proved to be the dominant factor in increasing user satisfaction because an engaging experience fulfills user expectations in terms of functionality and emotional comfort. In addition, E-S-Qual and SCM also contribute significantly to user satisfaction by providing reliable services and timely delivery. In terms of mediation, platform usability plays a role in the relationship between UX and user satisfaction, although with a weak effect, while there is no mediating role for the relationship between E-S-Qual and SCM on user satisfaction. Users tend to perceive direct benefits from e-service quality and supply chain management without being influenced by perceived platform usability.

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