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Determinants of Continuance Intention to Use Mobile Commerce during the Emergence of COVID-19 In Indonesia: DeLone and McLean Perspective

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Abstract: The level of online shopping in Indonesia has been increasing since its inception, especially due to the COVID-19 pandemic which has caused a more significant increase. In addition to the quality of supporting applications, service quality in the form of timeliness in delivery and suitability of goods ordered by consumers are also important aspects that need to be considered by businesses that use the Electronic Commerce (E-commerce) platform. This study aims to examine the effect of system quality, information quality, and reliability on user satisfaction of Mobile Commerce (M-commerce), the effect of user satisfaction on the intention to use M-commerce continually, and the role of user experience in strengthening the relationship between user satisfaction and intention to use M-Commerce continually. We used 196 M-commerce consumers who conducted online shopping within three months (April-June 2020) as samples. Hypothesis was tested using PLS-SEM. The findings prove that customer satisfaction is not only determined by technological factors such as system quality, but also customer value, such as service accuracy in delivering products. Furthermore, this study has a practical contribution whether understanding individual behavior in M-commerce adoption can be an effective tool to help decision makers develop superior strategies to compete in the digital era and can be used to make policies.

Keywords: E-Commerce, M-Commerce, System Quality, Information Quality, Reliability, Satisfaction, Experience, Continuance Intention.

Introduction

Currently the whole world is facing the COVID-19 era, which requires all levels of society to carry out social distancing, which has an impact on reducing people's daily activities.

Previously, people shopped to meet household needs through traditional and modern markets, but now the intensity has decreased due to this social distancing policy. This has greatly affected economic growth and led the company to rearrange its strategy so that it can still reach consumers. The level of online shopping in Indonesia has always increased since its emergence, especially because the COVID-19 pandemic has caused a more significant increase (IPrice, 2020). This can be seen from the information reported on the I Price (2020) website which stated that all types of products have experienced an increase in purchasing range from health products, such as hand sanitizers. This is considered as a preventive measure to reduce the spread of the virus. Those sales have the highest percentage of interest in shopping until 1986% (IPrice, 2020). In addition, products that support hobbies and most importantly food products have also increased.

As a result of changing times that are increasingly dynamic, companies must be able to keep up with developments by implementing the right marketing strategy to increase sales (Febrian & Hapsari, 2019). This strategy is carried out by shifting from traditional sales to online sales through Electronic Commerce (E-commerce). Changes in people's lifestyle and behavior caused by the COVID-19 era have made the use of E-commerce increasingly attractive to the public. E-commerce is considered a major contributor to the world economic system, because of its adaptability and ease of use for both customers and service providers (Ali Abumalloh et al., 2020). Indonesia become a country with highest E-commerce user. This is proven from Katadata.com (2021) that shows 88,1% internet users in Indonesia use E-commerce service to purchase certain product in last few months. This percentage is the highest in the world from We Are Social survey in April 2021 (Katadata.com, 2021). The increasing public interest in E-commerce, the more efficient the use of E-commerce through smart phones (smartphones) with an innovation known as Mobile Commerce (M-commerce). Both E-commerce and M-commerce transact business through online, however, E-commerce is carried out by desktop while M-commerce is by smartphones. There are various E-commerce and M-commerce applications that are used as online shopping platforms in Indonesia such as Shopee, Lazada, Bukalapak, Bli bli, JD ID and Tokopedia.

The increase of consumer interest in M-commerce must be supported by the quality of supporting applications, such as how the quality of the system and information provided makes it easy for consumers to use an application, so that consumers feel satisfied and increase sales (Wan Abdul Ghani et al., 2021). In addition to the quality of supporting applications, service quality in the form of timeliness in delivery and suitability of goods ordered by consumers are also important aspects that need to be considered by businesses that use M-commerce platforms. Timeliness and suitability of goods are determinants of customer satisfaction, which can encourage success in sales (Parasuraman et al., 2005). There are important factors that determine the relationship between customer satisfaction and sales success. This factor is the customer experience. Each customer assesses a product in different ways, depending on their respective experiences which may be influenced by different needs or differences in the ability of each consumer to use online application (Schrepp et al., 2014; Shao et al., 2020). Therefore, this study raises the user experience factor in strengthening the relationship between user satisfaction and continuance intention to use M-commerce.

Previous studies used DeLone and McLean's models to measure the level of technology adoption in Indonesia, such as Lina & Nani (2020) which examined information quality,

service quality and system quality on FinTech adoption intentions. The results stated that service quality and information quality greatly influence a person in adopting a technology, and system quality has no effect in the context of FinTech. Meanwhile, Azizah et al. (2020) found that system quality had no significant effect on satisfaction. This result contradicted with several studies which stated that system quality has a significant effect on the adoption of mobile banking applications in Saudi Arabia (Baabdullah et al., 2019) and e-learning in Nigeria (Yakubu & Dasuki, 2018). The differences in results were caused by different country contexts as well as differences in technology types. So, this study aims to fill the gaps of various previous studies by testing the DeLone McLean model on the intention to use E-commerce continually in Indonesia in the context of M-commerce. In addition, measuring the success of E-commerce which is evaluated through technological aspects is not sufficient (Li et al., 2020), so other important factors are needed that affect how transactions are carried out. Li et al (2020) suggested that logistical guarantees such as conformity with guaranteed arrival times can have an important influence in the development of E-commerce. So, this study adds the variable reliability as one of the drivers of M-commerce success. This study not only examines the influence of technological factors in determining the continuance intention of using M-commerce such as system and service quality, but also non-technological factors such as reliability and customer experience. This study aims to examine the effect of system quality, information quality, and reliability on M-commerce user satisfaction, examine the effect of user satisfaction on continuance intention to use M-commerce, and examine the role of user experience in strengthening the relationship between user satisfaction and continuance intention to use M-commerce. This research also has a practical contribution whether understanding individual behavior in M-commerce adoption can be an effective tool to help decision makers develop superior strategies to compete in the digital era and can be used to make policies (Lestari, 2019).

Literature Review

DeLone and McLean Model (2003)

The DeLone and McLean (D&M) model in various studies in different contexts has been used to measure the success of information systems. The D&M model consists of six components, namely system quality, information quality, service quality, use intention, user satisfaction, and benefits described in the research of Seddon & Kiew (1996); Rai et al. (2002). Various studies have conducted tests using the D&M Model in various research contexts such as Ramírez-Correa et al. (2018) used the D&M Model to explore student satisfaction with information systems in higher education. Furthermore, Lai (2014) conducted research using the D&M Model in the context of E-commerce by adding the convenience factor of electronic services. Aldholay et al. (2018) used the D&M Model to measure the quality of the online learning system in Yemen. Furthermore, Aldholay et al. (2019) used the D&M Model again to expand their study of students' perspectives in Yemen towards the use of online learning systems. In the context of the FinTech application carried out by Lina and Nani (2020) using 3 components in the D&M Model by adding a moderating variable, privacy concerns as a moderating variable. This study uses 2 components in the D&M Model (2003), namely system quality, information quality and adding aspects of electronic service quality, namely reliability, which will be examined on customer satisfaction and continuance intention in the context of M-commerce.

Hypothesis Development

DeLone & McLean (2003) defined system quality in the internet as the extent to which the utility, availability, reliability, adaptability, and response time of the application are defined. In today's digital era, users really want convenience and speed in various online activities, including shopping applications. When the response from the system is fast and makes it easier for customers when using M-commerce, it will increase user satisfaction. This is supported by Lai (2014) which stated that system quality affects user belief that a system is very useful for users and satisfaction. So that the hypothesis is formed as follows:

H1: System quality has a positive effect on customers' satisfaction of M-commerce

The quality of information includes all aspects that are in the content of an application that is complete, appropriate to consumers, easy to understand, and safe (DeLone and McLean, 2003). The information in an E-commerce is very important in attracting the attention of consumers. The more complete information about a product, the navigation of application use can provide benefits and lead to satisfaction in using the application. This is supported by various studies such as Lina and Nani (2020) who measured the quality of information on FinTech applications, the results state that the quality of information can encourage users to adopt FinTech applications. Consumers also tend to switch to other mobile applications if they cannot clearly present their main business content or respond to consumer concerns, making it difficult for consumers to find the information they want (Li et al. 2020). Lai (2014) also proved that when an application or website provides accurate information it will form a decision. Therefore the hypothesis is formed as follows:

H2: Information quality has a positive effect on customers' satisfaction of M-commerce

Parasuraman et al. (2005) defined reliability as a true technical function of a site and the accuracy of service promises such as having stock of goods, providing appropriate orders, timely delivery as promised, and appropriate product information. Al-dweeri et al. (2019) defined reliability as the match between what is ordered and the real product. Shopping online is indeed very easy for consumers to choose products. Usually an M-commerce promises various advantages over offline shopping such as timeliness and suitability of goods. So that the speed of delivery, the authenticity of the product with what is displayed on the M-commerce page is also important because users want products that really match what they choose when shopping, this greatly affects satisfaction where what is expected is in accordance with reality. This is evidenced by Al-dweeri, et al. (2019) that showed the accuracy of the delivery of goods or services within the promised time has a positive effect on both satisfaction and loyalty. So that the hypothesis is formed as follows:

H3: Reliability has a positive effect on customers' satisfaction of M-commerce

Satisfaction is common behavior that manifested by consumers as a result from experience accumulation through purchasing (Liébana-Cabanillas et al., 2016). At the individual level, the continuance intention is considered a key factor in driving continued success in the business-to-consumer (B2C) context of an E-commerce company (Lai, 2014). Satisfaction is defined as a feeling of pleasure or displeasure resulting from combining all the benefits that users expect from user interactions in an e-commerce system. Tam et al. (2020) found that satisfaction positively affect continuance intention to use mobile applications. When customers have high level of satisfaction, they will engage to M-commerce (Le et al., 2020; Marinkovi et al., 2020; Puriwat & Tripopsakul, 2021). The more M-commerce systems that are useful, the more likely consumers will be satisfied. When consumers are satisfied

they will be able to continue using M-commerce. So that the hypothesis is formed as follows:

H4: Customers' satisfaction has a positive effect on continuance intention to use M-commerce

Customers with high level of satisfaction will engage to M-commerce and resulting continuance intention (Le et al., 2020; Marinkovi et al., 2020; Puriwat & Tripopsakul, 2021). Customers' experience is defined as a person's perceptions and responses resulting from the anticipated use of a product, system or service. So the user experience is seen as a holistic concept covering all kinds of emotional, cognitive or physical reactions. For the success of a product or service, companies need to ensure that customers have a excellent experience when using a service and product. Excellent customers' experience can encourage customers to feel utility and expected performance, so this will affect satisfaction and continuance intention (Schrepp et al., 2014; Palos-Sanchez et al., 2021; Shao et al., 2020). So that the hypothesis is formed as follows:

H5: Customers' experience strengthens the relationship between user satisfaction and continuance intention to use M-commerce

Methods

Sample

This research is a quantitative study using primary data in the form of a questionnaire. The sample selection criteria used non-probability sampling with purposive sampling type. The criteria of sample was M-commerce consumers who purchase online within three months in April-June 2020 because in these months, COVID-19 pandemic in Indonesia began to increase (Katadata.com) and large-scale social restrictions in various cities in Indonesia enforced.

Data collection

To ensure this sample met the criteria, we used screening question in questionnaires "Have you ever shop in Mobile Commerce in last 3 months (April-June)?". After distributing questionnaires by google form, we got 196 that met the sample criteria. Hypothesis were tested by Partial Least Square-Structural Equation Modeling (PLS-SEM) with WarpPLS 6.0. This study used PLS-SEM instead CB-SEM because PLS lie mainly in its robustness, and its estimation approach handles not only very small but also very large samples with more ease than CB-SEM (Hair et al., 2010).

Instruments

Instruments were modified from several previous studies and summarized in the following table:

Table 1. **Research Instrument**

Construct	Operational Definition	Source
System quality	The extent to which M-commerce adapted, available, reliable, responsive, usable for customers.	DeLone dan McLean (2003), Aldholay et al. (2018)
Information quality	The extent to which M-commerce complete, ease to understand, relevant, and security for customers.	DeLone dan McLean (2003), Aldholay et al. (2018)

Reliability	The extent to which M-commerce accurate in-service promises, goods delivery, billing, and product information to customers.	Al-dweeri et al. (2018), Parasuraman et al. (2005)
Satisfaction	Feeling of pleasure resulting from combining all the benefits that customers expect from interactions.	DeLone dan McLean (2003), Aldholay et al. (2018)
Experience	M-commerce continuous improvement, comparison with competitors, fulfillment of consumers' expectations, improvement from M-commerce	Schrepp et al. (2014)
Continuance intention	Continue/discontinue using M-commerce	(Bhattacherjee, 2001)

Findings

We used 196 sample dominated by women (66%) aged 17-25 years (57.1%). 77.8% of respondents did online shopping using the Shopee application, 13.8% using the Tokopedia application, and the rest using the Lazada and Bukalapak applications. Respondents on average did online shopping 1-5 times (79%) in three months (April-June 2020) and 15.8% of respondents did online shopping 5-10 times, while the rest shopped more than 10 times in three months.

Table 2. **Profile of Respondents**

Demographic Variable	Category	Frequency	Percentage
M-commerce Platform	Lazada	12	6.9%
	Tokopedia	26	13.8%
	Shopee	155	77.8%
	Blibli.com	0	0%
	Bukalapak	3	1.5%
Purchasing frequency	1-5	156	79%
	5-10	31	15.8%
	>10	9	5.2%
Age	17-25	113	57.1%
	26-30	43	22.5%
	>30	40	20.4%
Gender	Women	129	66%
	Men	67	34%

Before testing the hypothesis, it must be ensured that the research model is fit and the instrument is valid and reliable. The suitability of the model in this study is seen from the value of the Tenenhaus Goodness of Fit (GoF) (Tenenhaus et al., 2000). In this study, GoF has a value of= 0.678, means that the model is suitable and hypothesis testing can be done. This study measures the validity by Average Variance Extracted (AVE) and reliability by Cronbach Alpha. In this study, all instruments are valid and reliable, it can be seen in table 2. The summary of the validity and reliability test results shows that all variables have a value of AVE> 0.5 and Crombach Alpha> 0.6.

Table 2. **Validity and Reliability Result**

	SQ	IQ	R	S	CI	E
Cronbach Alpha	0.897	0.896	0.826	0.806	0.922	0,845
Average Variances Extracted	0.710	0.710	0.658	0.837	0.927	0.686

Source: Processed Data form Warp PLS 6.0
SQ: System Quality, IQ: Information Quality, R: Reliability, S: Satisfaction, E: Experience, CI: Continuance Intention

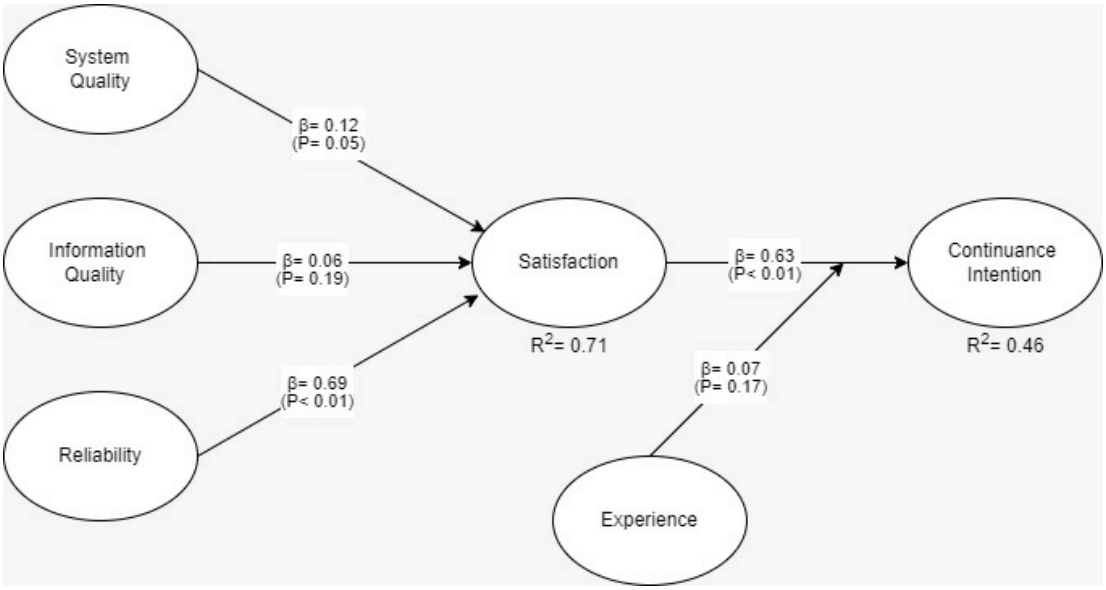
After all instruments are valid and reliable, then Hypothesis testing is conducted. Result of Hypothesis 1 testing has p-value 0.05 and β= 0.12. It means that system quality has a positive effect on satisfaction of M-commerce use (H1 is supported). M-commerce applications have met all user expectations in terms of the system, namely timeliness and reliability. This result support Lai (2014) who found that system quality affected user belief that a system is useful for user satisfaction and Al-Naimat et al. (2020) system quality is main factor that affects M-commerce. Furthermore, Hypothesis 2 has p-value 0.19 and β= 0.06 which means that information has no effect on user satisfaction (H2 is not supported). Respondents feel that even though M-commerce had completed the information and personalization with consumer preferences, it is not sufficient to make consumers feel satisfied. Currently, the information for providing recommendations for purchasing product is obtained from various sources such as news, social media, and customer's reviews. Therefore, information quality in M-commerce has no effect on customer satisfaction. This result contradicts to Lina and Nani (2020) who found that information quality can encourage users to adopt mobile application.

Hypothesis 3 has a p-value <0.01 and β= 0.69. It shows that reliability has a positive effect on user satisfaction of M-commerce (H3 is supported). It is supported by Al-dweeri et al. (2019) who found that the accuracy of the delivery of goods/services within the promised time has a positive effect on both satisfaction and loyalty. In pandemic era, all types of products experienced an increase in purchases started from health products to products that support hobby. Online shopping is considered as a preventive measure to reduce the spread of the virus (I price, 2020). The shift in online shopping continually is not only affected by necessity factors but also other factors such as vendors and M-commerce that provide services according to user desires. From the result of the study, it is proven that when the expectations desired by consumers match reality, such as real products and on time delivery, it will increase customer satisfaction in using M-commerce.

P-value <0.01 and β= 0.63 for hypothesis 4 show that user satisfaction has a positive effect on continuance intention to use M-commerce (H4 is supported). This means that the more useful E-commerce systems, the more likely it is that consumers will be satisfied and reuse M-commerce. Meanwhile, Hypothesis 5 shows p-value 0.17 and β= -0.07 which means that user experience does not moderate the relationship between user satisfaction and continuance intention to use M-commerce (H5 is not supported). This result contradicts to Schrepp et al. (2014) who stated that for the success of a product or service, companies need to ensure that users have a high experience when using a service and product. In this study, user experience did not categorize low and high experiences therefore the results did

not moderate positively, this was also influenced by respondents and the time of the study. The overall results of hypothesis testing can be seen in Figure 1 below:

Figure 1. **Results of Structural Model**



Conclusion

The findings prove that customer satisfaction is not only determined by technological factors such as system quality, but also customer value, such as service accuracy in delivering products. It means the logistical guaranteed factor has proven to be an important factor in shaping the success of M-commerce. When customers are satisfied with M-commerce, they will purchase continually with the application. This study has a practical contribution whether understanding individual behavior in M-commerce adoption can be an effective tool to help decision makers develop superior strategies to compete in the digital era and can be used to make policies. The results of this study are inseparable from several limitations. First, this study cannot prove the role of user experience in the success of m-commerce. The second limitation is that the sample is still not representative of the population, where the number of samples used is only 196. This number is still small to represent the population of M-commerce users in Indonesia who were shopping online in the emerge of the COVID-19 pandemic. Future studies can use user experience variables by separating the high and low experiences measured using a dummy. In addition, further research can also expand the sample of M-commerce users in Indonesia who purchase online during the emerge of the pandemic. Last, this study only focuses on how the M-

commerce relationship to consumers (B2C), further research can expand research in M-commerce relationships to vendors/stores in M-commerce (B2B).

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