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Level of Use and Satisfaction of E-Commerce Customers in Covid-19 Pandemic Period: An Information System Success Model (ISSM) Approach

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A B S T R A C T S

Pandemic outbreaks of COVID-19 have made customers take drastic steps to help world governments to prevent further spread, one of which is by social distancing. This policy made buying and selling online a convenient option to fulfill the needs for goods and/or services. The purpose of this study was to determine the level of use and satisfaction of e-commerce customers in the COVID-19 pandemic period with the information system success model (ISSM) approach that was formed through system quality, information quality, and service quality. The research method used a quantitative approach by distributing questionnaires to respondents of 206 e-commerce costumers. Data analysis used Structural Equation Modeling (SEM) where the results confirm that system quality, information quality, service quality, affected the level of use and user satisfaction of e-commerce customers. E-commerce companies are recommended to maintain, even improve system quality and information quality because information that is less interesting, less relevant, and difficult to understand results in low information quality, which in turn, can reduce the level of use and customer satisfaction.

A R T I C L E   I N F O

1. INTRODUCTION

Electronic commerce (e-commerce) is growing in popularity in the world economy. It began in 1995 when the need for digital goods was needed to maintain company transactions. Digital goods are things that can be sent via digital networks (Laudon & Laudon, 2015). E-commerce is sales made through electronic media. E-commerce is also one type of electronic business mechanism that focuses on individual-based business transactions using the Internet as a medium for exchanging goods or services (Surawiguna, 2010). E-commerce brings big business opportunities such as product sales and online service provision and revenue growth (Rohm & Swaminathan, 2004) especially for companies such as e-retailers because of their easy and interactive nature, lower costs, high customization and personalization for customers (Santos-Vijande *et al.*, 2013).

E-commerce has become one of the important strategies in business today, because e-commerce can increase the level of efficiency in company operations. The types of e-commerce based on the type of relationship consist of (Abdu'a & Wasiyanti, 2019):

(a) Business to Business (B2B), a type of inter-company transaction to other companies. For instance, a distributor gets their goods from a manufacturer. Prices that occur are often adjusted to the number of orders and negotiations;

(b) Business to Consumer (B2C). Transactions that occur are usually directed to end consumers, where the seller can be a distributor, as a producer or as a retailer. In this transaction, the shopping cart on the website page is used to accommodate consumer demand for catalogs available on the website;

(c) Customer to Business (C2B). This transaction is the opposite of the type of B2C. The final customer acts as the seller, while the company acts as the buyer. This activity is carried out using the Internet network, for example Google Play. Google allows users to upload activities to their servers so that applications created by their customers can be sold to other Google Play users. This collaboration occurs between a and from the developer;

(d) Consumer to Consumer (C2C). Types of transactions that occur between consumers and consumers, such as in a market place. Market place is called consumers, selling products or services that they have to other consumers.

The emergence of COVID-19 which stands for Corona (CO), Virus (VI) Disease (D) in 2019 (19), occurring in Wuhan, has had a major impact not only in the health sector, but also on the economy, including economic activities related to the process of purchasing goods or services. The condition of the corona pandemic COVID-19 followed by the implementation of social distancing led to new consumer behavior in determining purchasing patterns (https://nasional.kompas.com/read/2020/04/25/15472271/update-25-april-kasus-covid -19-di-indonesia-mencapai-8607).

Consumers are now using online tools and are increasingly looking for online channels to research and buy the products or services they need (Dirgantari *et al.*, 2019). This also makes competition between e-commerce companies more stringent.

The outbreak of Covid-19 in Indonesia has made online shopping the choice of many parties to obtain goods as shown in **Table 1** where there has been an increase in the number of visits to various marketplaces in Indonesia.

Based on the commercial data in Indonesia, the total estimated E-Commerce transactions during the Covid-19 pandemic reached a peak after the announcement of

the Large-scale Social Limitation (PSBB) policy on March 31, 2020, which was 670,755 transactions. Total estimated sales during this period were quite high at Rp 12.3 billion. This e-commerce activity takes place using a variety of platforms as shown in **Figure 1** where Indonesia has the highest level of e-commerce usage among countries in the world, with 90% of the country's Internet users aged between 16 and 64 who report that they have purchased products and services online as reported by GlobalWebIndex (Kemp & Moey, 2019).

E-commerce companies should increase customer satisfaction to maintain and even increase online buying and selling transactions. In the context of e-commerce, customer satisfaction is usually defined as comparing from other e-commerce compa-nies that cause customer re-purchases. Customer satisfaction can be defined as a favorable customer attitude towards e-commerce that results in consumers making repeat purchases (Goić *et al.*, 2011).

Kotler and Keller (2016) argue that satisfaction is the level of feeling in which someone states the results of a comparison of the performance of products or services received and expected after making a purchase or use. Consumer satisfaction, according to Kotler and Keller (2016), is a feeling of pleasure or disappointment someone who comes from a comparison between his impression of the results of a product with expectations. Customer expectations are believed to have a large role in determining satisfaction (Meidita *et al.*, 2016).

Tabel 1. Web visit total consumer (https://iprice.co.id/insights/mapofecommerce/)

Merchant	Web Visit (million)			Total Consumer (2017-2019)
	2017	2018	2019	
Shopee	27.8	67.6	72.9	16,835,059
Tokopedia	115	168	67.9	6,381,186
Bukalapak	80.0	116	39.2	2,419,523
Lazada	131	58.2	28.3	2,948,880
Blibli	52.4	43.0	26.8	8,632,581

Figure 1. e-commerce Activities In Indonesia (https://datareportal.com/reports/digital-2019-ecommerce-in-indonesia).

Customer expectations are customer beliefs before trying or buying a product used as a standard or reference in choosing the product's performance. One factor in winning thse competition can be seen from the number of customers who use the products or services offered by the company (Zeithaml *et al.,* 1993). The increasing level of satisfaction will increase the tendency of consumers to repurchase products offered by the company. If consumers have felt satisfied, it will create a good cooperative relationship between consumers and companies (Buttle & Maklan, 2019).

One key to success of e-commerce is information systems. The success of e-commerce must be balanced with a good information system because without it, there will be no transactions (Abdu'a & Wasiyanti, 2019). The information technology system success model is one with a good information system using sophisticated technology, complete but simple. Information system success is designed simply to review the use of information systems (Widiaty *et al.,* 2020). Thus, the benchmarks of information system success can be viewed from a simple model but are considered valid (Hartono *et al.,* 2010).

Since its publication in 1992, nearly 300 articles in journals refer to the use of DeLone and McLean (2003) as a successful model as a basis for measuring variables related to information systems (IS). This model is based on Shannon and Weaver's classic communication theory adjusted by Mason to measure impact. As a strong communication and trade intermediary, the Internet is a communication and phenomenon that encompasses itself into a measurement framework (for example, DeLone and McLean model) that is built based on communication theory. In the context of e-commerce, the main system users are customers or suppliers rather than internal users. Customers and suppliers will use the system to buy or sell and carry out business transactions. These electronic decisions and transactions can affect each individual user, organization, industry and even the national economy. There are six variables that affect the quality of e-commerce systems based on the Information System Success Model (ISSM) from DeLone and McLean, namely (Angelina *et al.,* 2019):

(1) information quality,
(2) service quality,
(3) usage,
(4) customer satisfaction,
(5) internet benefits.

In this study, the measurement is limited to measuring customer satisfaction.

The use of information system technology has proven to be able to reduce costs, create faster and more efficient work processes, and offer a high degree of flexibility. Delone and Mclane model updates have been widely used, including using the modified Delone and Mclane model to measure the success of e-learning systems at universities. It is also used to evaluate the success of information systems management projects, and can be useful for decision making in organizations in evaluating the implementation of information systems (Gu & Jung, 2013).

Thus, the purpose of this study was to determine the level of use and satisfaction of ecommerce customers during the Covid-19 pandemic by using the information system success model (ISSM) approach formed through system quality, information quality, and service quality.

2. METHODS

This research used a quantitative method with data obtained from the respondents' direct responses through questionnaires to explore more specific information about the description of the level of usage and e-commerce customer satisfaction in the Covid-19 pandemic period with the Information System Success Model (ISSM) approach through System Quality

(SQ), Information Quality (IQ), Service Quality (SerQual) and Use (U).

The dimensions used for System Quality (SQ) are adaptability, availability, reliability, response time and usability. Dimensions of Information Quality (IQ) include completeness, ease of understanding, personalization, relevance and security. The Service Quality (SerQual) dimension is assurance, empathy and responsiveness. Dimensions of Use (U) include nature of use, navigation patterns, number of site visits and number of transactions executed, and dimensions for User Satisfaction (US) are repeat purchases, repeat visits and user surveys (Delone & Mclean, 2003).

The data analysis technique used is Structural Equation Modeling (SEM) where there are basic assumptions that need to be met, one of them regarding sample size. The sample size for SEM models with the number of latent variables (constructs) up to 5 and each construct is explained by several indicators, the sample size of 100-150 respondents has been considered adequate (Saputro _et al.,_ 2015), while Ghozali (2014) suggested the SEM sample size between 100 to 200 respondents. Large sample sizes are very critical to get the right parameter estimates. Then the number of samples in this study was determined by 200 Shopee customers because Shopee is ranked first in the top five e-commerce sites in Indonesia (https://iprice.co.id/insights/mapofecommerce/).

This research used a Likert scale with a range of strongly disagree (score 1) to strongly agree (score 5) and uses purposive sampling method. The survey was conducted for 2 months on e-commerce shopee customers during March-April 2020.

The research model are shown in **Figure 2**, while the hypotheses for this research are as follows:

H_1: System quality affect Use
H_2: System quality affect User Satisfaction
H_3: Information quality affect Use
H_4: Information quality affect User Satisfaction
H_5: Service quality affect Use
H_6: Service quality affect User Satisfaction
H_7: Use affect User Satisfaction

3. RESULTS AND DISCUSSION

After the data were processed, 206 valid respondents were obtained. Demographic characteristics as shown in the **Table 2** shows 62.14% of respondents were female and 37.86% are male, while the majority of the age group of respondents were the age group of 20-24 years by 88%. The majority of respondents had more than 5 times online shopping experience.

To determine the internal reliability of the variables used in the model, Cronbach's alpha for responses taken. The results as shown in **Table 3** indicate that Cronbach's alpha value for all variables are more than 0.8 which mean all variables are reliable.
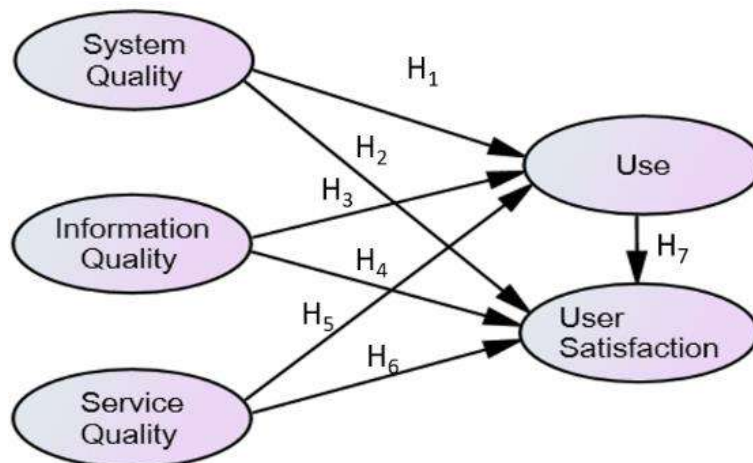

Figure 2. The research model

The results show that the research model was good, as shown by model fit indices in **Table 4**.

To test the hypotheses and structural models, confirmatory factor analysis is used for evaluate the significance and strength of the path. The results are shown in **Figure 3** and **Table 5**. The path coefficient shows that of the 7 relationships tested, all are significant, which means that the system quality, information quality, service quality, significantly affected the use and user satisfaction.

As seen in **Table 5**, H1, that is, System Quality affects Use shows that system quality can increase use and this result is in accordance with the study conducted by Veranika and Murtini (2017) that in as-

sessing the use variable, system quality still has opportunities in implementing the system. The system quality implementation aims to develop the system in increasing use. Developers can improve Shopee's system quality as a criteria expected by users so that the level of use continues to increase in the future, whereas H2, which is the Effect of System Quality on User Satisfaction, shows that system quality can increase user satisfaction. This is consistent with research conducted by Sultono *et al.* (2016) which needs to be evaluated periodically by the management of system quality by involving users, in order to ensure that user needs are met so that user satisfaction is achieved.

Table 2. Respondents demographic

	Demographic	Frequencies	%
Gender	Male	78	37.86
	Female	128	61.14
Age	20 – 30	182	88.3
	31 – 40	14	6.8
	> 40	10	4.9

Table 3. Construct analysis

Construct	Mean	SD	Cronbach's Alpha
System Quality	3.996	0.754	0.893
Information Quality	3.920	0.753	0.812
Service Quality	3.628	0.782	0.821
Use	3.988	0.824	0.863
User Satisfaction	3.971	0.871	0.884

Table 4. Model fit indices

	Cutting point	Model indices
CFI	>0.90	0.932
GFI	>0.90	0.940
RMSEA	<0.08	0.068
NFI	>0.80	0.932
PNFI	>0.05	0.093
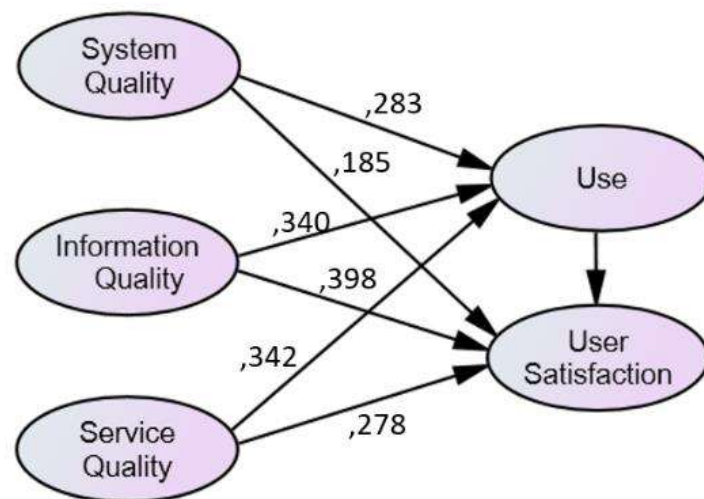
Figure 3. Path Coefficient

Table 5. The hypotheses results

Hypothesis	Relationship	Estimate	p-value	Significance
H1	System Quality → Use	0.283	<0.01	Significant
H2	System quality → User Satisfaction	0.185	0.004	Significant
H3	Information quality → Use	0.340	<0.01	Significant
H4	Information quality → User Satisfaction	0.398	<0.01	Significant
H5	Service quality → Use	0.342	<0.01	Significant
H6	Service quality → User Satisfaction	0.278	<0.01	Significant
H7	Use → User Satisfaction	0.283	<0.01	Significant

The result of H3, which is the Effect of Information Quality on Use, shows that information quality can increase use. In this research, information quality has a positive effect on use. However, based on research conducted by Rahayu *et al.* (2018) states that information quality does not have a significant effect on use. Unattractive presentation of information, inaccurate information relevance, and language that is not easily understood result in a lack of information quality.

The effect of Information Quality on User Satisfaction (H4) shows that information quality can increase user satisfaction. This is in accordance with the research conducted by Wibowo (2013), that information quality has the most dominant influence on user satisfaction because information quality relating to the delivery of information about the stages that must be passed by the user is clearly conveyed (with pictures that make it easy for users to digest each well stages). Whereas H5, which is the Effect of Service Quality on Use, shows that service quality can increase use. Research conducted by Kallweit *et al.* (2014) explains that their research on the effects of service quality mediation in technology implementation models found that service quality is part of mediating effects on attitudes or intentions to use a service or product. Therefore, retailers must emphasize service quality related to use.

Hypothesis six results (H6) Effect of Service Quality on User Satisfaction shows service quality can increase user satisfaction. In a study conducted by Susnita (2020), service quality has a positive and significant effect on user satisfaction. While the research conducted by Mulyapradana *et al.* (2020) shows that service quality does not have a significant effect on user satisfaction because items from service quality that have a

significant effect are only responsiveness items. While Hypothesis seven (H7) Effect of Use on User Satisfaction shows system quality can increase user satisfaction. This is in accordance with research conducted by Dwivedi *et al.* (2013) which explains that from this study factors such as system quality and use affect consumer attitudes positively so that they are related to user satisfaction.

4. CONCLUSION

Overall, the use of the information system success model (ISSM) approach formed through system quality, information quality, service quality has proven to affect the level of usage and ecommerce consumer satisfaction, especially in the current co-19 pandemic. The ecommerce company must continue to improve the system quality as the criteria expected by the user so that the level of its use will increase in the future and still maintain and even improve information quality because of the presentation of information that is less attractive, the relevance of information that is less precise, and language that is not easily understood is a deficiency from the quality of information which can reduce the level of use and customer satisfaction.

5. ACKNOWLEDGEMENTS

6. AUTHORS' NOTE

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article. The authors also confirm that the data and the paper are free of plagiarism.

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