

## **Study on the Development and Use of E-commerce in the Special Region of Yogyakarta with De Lone and Mc. Lean IS Success Model**

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### *Abstract*

*The high growth of e-commerce in Indonesia is influenced by several things, such as the quality of human resources and internet network infrastructure. The utilization of information technology in running a trading business or often known as e-commerce for small companies can provide flexibility in production to the final delivery process of a transaction. This includes the Special Region of Yogyakarta (DIY), which is one of the areas with the highest level of e-commerce service users in Indonesia.*

*Although DIY is one of the areas with the highest level of e-commerce service users in Indonesia, the level of e-commerce business activity in Indonesia, the level of e-commerce business activity is still relatively new, so there are still many shortcomings in its implementation. Therefore, research needs to be done to study the development and utilization of e-commerce in the Special Region of Yogyakarta (DIY).*

*Researchers use e-commerce metrics suggested by De Lone and Mc. Lean (2004) as the foundation of the instrument. Research data processing using Smart Partial Least Square (Smart-PLS) 3.0. The analytical model used in this study is a structural equation model (SEM) and inductive analysis using the goodness of fit model (inner model) research, which determines the suitability of a model used in this study.*

*Keywords: e-commerce, digital economy, information system*

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## 1. INTRODUCTION

Business development continues to grow and advance after the presence of e-commerce in Indonesia. The seller meets the buyer and then negotiates the transaction so easy. The easy, fast, and practical process is a big hope for consumers. Especially in this era of industrial revolution 4.0, consumers no longer need to come directly to the store to see products and make a price bargaining process. However, they only need to look at the e-commerce destination, then look at the catalogs that are available, and choose a shipping service that has collaborated with e-commerce parties.

It is the same in the government sector. In the era of the development of technology and information based on the Industrial Revolution 4.0 and will soon enter the 5.0 era, the application of e-transactions in regional financial management is very necessary to facilitate the process of financial accountability of regional apparatus organizations (OPD) to prevent the occurrence of financial abuse in local government. In addition, the e-transaction system is considered more practical, efficient, and effective in supporting the regional economy by increasing the acceleration of money circulation.

The rapid growth of e-commerce in Indonesia has made Indonesia the largest e-commerce market in Southeast Asia. From the results of research that has been carried out since 2019, the DBS Bank Research Team explained that as many as 90% of Indonesian internet users have made purchases in e-commerce. Still based on the results of the same survey, online shopping activities during the COVID-19 pandemic increased by 14%, and shopping at shopping centers decreased significantly by 24%. Before the pandemic, 72% of consumers preferred shopping in stores to shopping online. However, after the pandemic, shopping activities at traditional markets decreased to 30% from the previous 52%. This is due to a changing pattern of people who prefer to switch shopping platforms to online.

The opportunity for the advancement of the digital market in Indonesia looks even more promising after the Covid-19 pandemic. The pandemic has increasingly opened the potential for digital economic growth in Indonesia. The 2020 survey conducted by the Mandiri Sekuritas Team explained that 37% of digital consumers were new customers. Meanwhile, 56% of new digital customers come from outside big cities (non-metro regions). In addition, the legacy behavior of the Indonesian people is that there are still many who are underbanked by having mobile payments so they will directly use digital payments and make transactions using e-commerce (Faruq, 2021).

The launch of the Quick Response Code Indonesian Standard (QRIS) as of August 17, 2019, aims to make the transaction process of all merchants, merchants, stalls, parking, tourist tickets, donations with the QRIS logo easier, faster, and more secure even though the QRIS provider at merchants is different from the application provider. used by society. In 2020, as many as six million merchants in 34 provinces, 480 districts/cities, and 85 percent of them are MSMEs (micro small medium enterprises), are recorded to have used QRIS. This is supported by 52 licensed Payment System Service Providers (PJSP). During the Covid-19 pandemic as of March 2020 until now, there have been indications of a shift in people's behavior in retail transactions from the EDC to the QRIS model. Even in its development, the use of QRIS already has an innovative use case without face-to-face (TTM). Buyers simply pay from home via QRIS sent by the store. The TTM use-case innovation is intended to support thematic sectors such

as retail of necessities, health, and donations. The method is very easy because traders just send a QRIS photo, scan it, select the gallery icon, take a QRIS photo, enter nominal, enter a PIN, click pay, save, and send proof of seller.

The increasing number of users is also influenced by the quality of information and the quality of services presented on each e-commerce page. Information quality is defined as the ease with which consumers can obtain information related to the product they are looking for. Consumers will rely on the descriptions and photos provided by the website to understand the product (Putri & Punjani, 2019). Sharma & Lijuan (2015), added that the quality of information is indirectly also closely related to service quality. Service quality refers to how well the services provided by internal providers or companies to consumers will affect consumer confidence so that the buying process will occur, meaning that the quality of information and services will determine consumer satisfaction as end-users.

The use of e-commerce which is very closely related to information technology is also closely related to the concept of the cyber city. The concept of a cyber city is described as an area with adequate information technology infrastructure in terms of integrated network connectivity, bandwidth capacity, wireless and cable internet, and the installation of Wi-Fi hotspots in a few open places such as public areas. So far, the concept of the cyber city has been widely applied in a few areas around the world, including the Special Region of Yogyakarta (DIY). DIY is one of the regions with the highest level of e-commerce service users in Indonesia, below Bandung and Jakarta with 81.3%.

The high level of users of this service is not only supported in terms of the implementation of the cyber city concept in DIY but is also influenced by the number of universities in DIY which is one of the highest regions in Indonesia so that it is conducive to encouraging the establishment of e-commerce businesses or startup businesses. In addition, the level of internet use in the business sector in DIY, which is among the highest, is also the cause of the high level of users of e-commerce services in DIY. Micro, small and medium enterprises businesses (MSMEs) is one of the causes of the increasing level of users of e-commerce services in the Special Region of Yogyakarta. Changes in business behavior patterns also affect changes in business models.

As of October 2021, as many as six and a half million merchants in 34 provinces, 480 districts/cities, and 85 percent of them are MSMEs, have been recorded to have used QRIS. This is supported by 57 licensed Payment System Service Providers (PJSP). Details of the number of merchants registered as QRIS users include large businesses as many as 324 thousand, medium enterprises 614 thousand, small businesses 1.5 million, micro-enterprises 4 million, and donations/social 15 thousand.

The business model currently being implemented is innovative and not inventive. Inventive is finding something but not applied in everyday life. While innovative is finding something and applying the findings in everyday life. Thus, innovators who carry out innovative activities are creative people in creating something to be applied in everyday life. Meanwhile, to accommodate business models through e-commerce that continue to grow, it is necessary to use information, communication, and technology systems or ICT (Kontolaimou & Skintzi, 2018).

E-commerce is also referred to as the application of ICT in business and commerce. The concept of e-commerce has developed in recent years and has led to the economic growth of several countries becoming more developed and

developing. As a country that has quite a lot of young people like India, on average, they do online shopping activities rather than directly. Young residents have high enthusiasm and want to learn new things including innovative ways of shopping through online media. This activity makes the company work hard to make changes to the sales strategy. They turned a lot of sales into an online strategy. The use of ICT is done to make and complete business transactions. The role of the internet is very important to shape the company's strategy to conduct e-commerce activities. ICT greatly influences the development of the e-commerce industry (Kumar, *et.al.*, 2014)

From the previous explanations, the level of e-commerce business activity in Indonesia, especially DIY, is still relatively new, so there are still many shortcomings in its implementation. These shortcomings include the inadequate internet network in several areas, especially in rural areas, and the concept of payment, which is still a problem for most residents, especially the cash on delivery (COD) system whose cases often appear on the surface. On this basis, the authors are interested in conducting a study of the development and use of e-commerce in the Special Region of Yogyakarta.

## **2. METHODS**

### **2.1. E-commerce concept**

E-commerce comes from electronic commerce. Loudon & Loudon (2014) explain that e-commerce refers to commercial transactions carried out digitally between individuals and companies. They explained that the concept of e-commerce development stems from the development of information technology which will affect the business transformation of each company in line with the demands of an increasingly modern and rapidly growing era. The existence of e-commerce provides many opportunities to sell directly to consumers, through intermediaries, such as distributors or retail outlets.

The presence of the concept of e-commerce can also reduce purchase transaction costs because it can significantly eliminate intermediaries in the distribution channel. Bukht & Heeks (2018) in their research add that e-commerce is a form of broad coverage of the existence of a digital economy which means that the application of e-commerce is very dependent on adequate information technology which includes distribution, purchasing, sales, service, public processes, relations, or through other innovations that may continue to grow.

### **2.2. Digital economy**

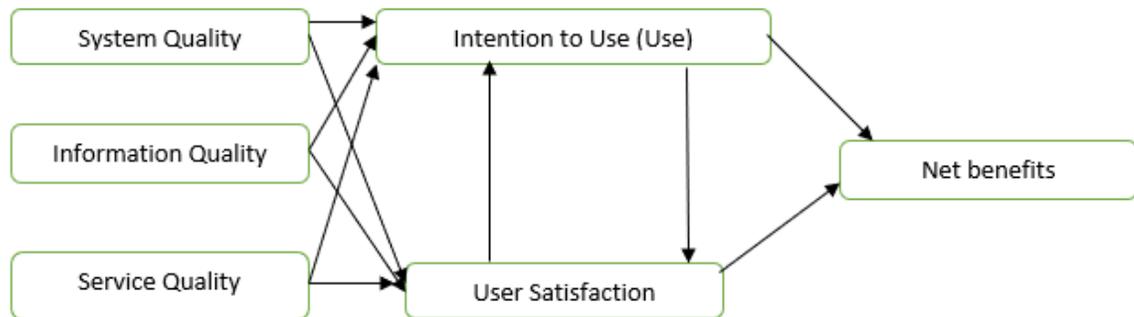
Today's business development is strongly influenced by technology that can unify the relationship between new economic concepts through e-commerce and business strategies to form a very close relationship. The digital economy or digital economy is a concept of economic activity that utilizes the assistance of information and communication technology (ICT) which includes e-commerce practices as an example of its application. This includes the process of buying and selling transactions, marketing, and other operational activities. The practice of e-commerce is the application of communication service practices to the application of product marketing strategies and the use of increasingly advanced internet developments (Zimmerman, 2000).

The digital economy or digital economy is part of the output that comes solely from digital technology. This means that current and future business model innovations will be influenced by the development of the digital economy. Bukht &

Heeks (2018), explained that the digital economy is part of the application of e-commerce which is also highly dependent on other digital sectors such as hardware manufacture, software and IT consulting, information services, and telecommunications.

### 2.3. Information Systems

Laudon & Laudon (2014) state that an information system is a collection of components that function to collect, store and process data and aims to provide information, knowledge, and digital products that work together to achieve a goal. Information systems are a skill that must be possessed by businesspeople who are influenced by changes in the business environment that tend to experience extraordinary changes. Every company must have a high-quality information system to be able to provide maximum benefits for users. De Lone and Mc. Lean in 1992 has conducted a study to define the success of an information system consisting of 6 variables. Such as system quality, information quality, intention to use, user satisfaction, individual impact, and organizational impact. Then they modify the existing findings in 3 main dimensions, namely information quality, system quality, and service quality. Another modification is the elimination of individual impact, and organizational impact as a separate variable which then replaces it with net benefits (Bahari & Mahmud, 2017).

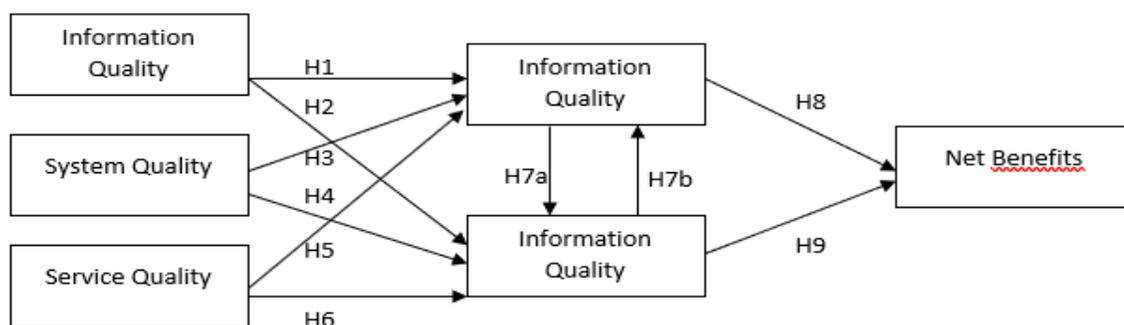


**Figure 1.** De Lone and Mc. Lean IS Success Model

Figure 1 shows De Lone and Mc. Lean, which in the end, many researchers have used and modified this model into their research. Chong *et.al.*, (2010) explained that the model can be carried out in an e-commerce environment as follows:

1. System quality measures the desired characteristics of an e-commerce system. These characteristics include factors such as reliability, adaptability, and ease of access when used.
2. Information quality measures the quality of information generated through e-commerce systems. The quality of information can also identify the impact of the information and content related to the data presented.
3. Service quality is the overall support provided by web-based service providers. The indicators used are assurance, empathy, and responsiveness which are considered as measures of service quality.
4. Intention to use (use) measures everything from website visits and navigation within the site to information retrieval and transaction execution.

5. User satisfaction is an important means of measuring customer opinions about e-commerce systems and should cover the entire customer experience cycle from information-seeking through purchase, payment, acceptance, and service.
6. Net benefits are the most important measure of success, as they capture the balance of positive and negative impacts of e-commerce on customers, suppliers, employees, organizations, markets, industries, economies, and even society.



**Figure 2.** Path Diagram

This model has been applied by many researchers into their research form, including Chong *et. al.*, (2010) who successfully applied the method in the business to consumer (B2C) framework of the student loan industry; Angelina *et. al.*, (2019) related to the application of the model to the use of e-commerce in Indonesia; and Dorobăț (2014) who managed to measure the success of e-learning using this method. From some of the explanations above, the hypotheses that can be concluded are:

- H1: System quality significant effect on the intention to use (use),
- H2: System quality significant effect on user satisfaction,
- H3: Information quality significant effect on the intention to use (use),
- H4: Information quality significant effect on user satisfaction,
- H5: Service quality significant effect on the intention to use (use),
- H6: Service quality significant effect on user satisfaction,
- H7a: Intention to use (use) significant effect on user satisfaction,
- H7b: User satisfaction significant effect on the intention to use (use),
- H8: Intention to use (use) significant effect on net benefits,
- H9: User satisfaction significant effect on net benefits.

#### 2.4. Research design

The research design used is confirmatory research to test the effect of system quality, information quality, service quality, intention to use, user satisfaction, and net benefits variables. This research includes field research by collecting data from the field. Meanwhile, for the time dimension, this study is included in the category of cross-sectional research which is a study in which information or data collected from research subjects are used only once in one time to answer the problem formulation (Sekaran and Bougie, 2016). The question instrument used adopted questions that had been developed by previous researchers using a 5-point Likert scale ranging from strongly disagree (1 point) to strongly agree (5 points).

The analytical model used in this study is the structural equation model (SEM). This research data can be carried out simultaneously with model testing, measurement, and structural model testing. The researcher continues to examine the structural model of Figure 2 where De Lone and Mc. Lean (2004) suggest a two-way relationship between system use (use) and user satisfaction (user satisfaction). In SEM the relationship is referred to as indeterministic and this study runs two separate structural models, one model with a causal relationship from use to satisfaction (H7a) and from satisfaction to use (H7b) (Chong, *et. al.*, 2010).

**2.5. Population and Sample**

The technique used is purposive sampling, namely the technique of determining the sample with one thing considered and the consideration is the residents who live in DIY who have or are currently using e-commerce. The minimum sample size is 100 people because it is based on five times the estimated parameters (Hair *et.al.*, 2014). Data was collected through the distribution of online questionnaires using google forms. Research data processing using Smart Partial Least Square (Smart-PLS) 3.0.

**2.6. Research Instruments**

This study uses e-commerce metrics suggested by De Lone and Mc. Lean (2004) as the foundation of the instrument. There are 28 items for various constructs and variables. This research was conducted on 4 e-commerce namely Lazada, Bukalapak, Tokopedia, and Shopee. There are 6 variables used to measure the research model, namely system quality (SQ), information quality (IQ), service quality (SeQ), intention to use (U), user satisfaction (US), and net benefits (NB).

**Table 1.** Research instruments

<b>Variable</b>	<b>Items</b>
<i>System Quality</i>	1. <i>Easy of use</i>
	2. <i>Reliability</i>
	3. <i>Accessibility</i>
	4. <i>Usefulness</i>
	5. <i>Flexibility</i>
	6. <i>Ease of navigation</i>
<i>Information Quality</i>	1. <i>Content</i>
	2. <i>Availability</i>
	3. <i>Accuracy</i>
	4. <i>Timeliness</i>
	5. <i>Conciseness</i>
	6. <i>Convenience</i>
<i>Service Quality</i>	1. <i>Service availability</i>
	2. <i>Security</i>
	3. <i>Responsiveness</i>
	4. <i>Service quality</i>
<i>Intention to Use (Use)</i>	1. <i>Updating account information</i>
	2. <i>Accessing information to solve problems</i>
	3. <i>Information retrieval to solve problems</i>

Variable	Items
User Satisfaction	4. Completion of the transaction
	1. Meets customers needs
	2. Efficient exchange of information
	3. Satisfaction with service
Net Benefits	1. Reduction of administrative costs
	2. Reduction in time
	3. Enhancement of service
	4. Enhancement of customer relationship
	5. Improved communication

Notes: Chong *et.al* (2010).

Inductive analysis using Partial Least Square (PLS) includes goodness of fit model research (inner model) which serves to determine the suitability of a model used in this study using 6 variables. The correlation between constructs is measured by path coefficients and the level of significance which is then compared with the research hypothesis. The significance level used is 5% and the data analysis technique used is Warp PLS 6.0 software so that R-square can be obtained as a measure of goodness-of-fit (Chin & Newstead, 1999).

## 4. RESULT AND DISCUSSION

### 4.1. Characteristics of respondents

Table 2 shows that most respondents are female (65.11%). Meanwhile, the working status was dominated by employees(?) (49.58%).

**Table 2.** Characteristics of Respondents

Gender		%	Job Status		%
Men	142	34.89	Working	178	49.58
Women	217	65.11	Student	102	28.41
			Housewife	79	22.01
<b>Total</b>	<b>359</b>	<b>100</b>		<b>359</b>	<b>100</b>

Notes: Primary data processed (2021)

### 4.2. Test Measurement Model

Before the analysis based on the structural equation model with Smart-PLS 3.0, validity and reliability tests were carried out to ensure the adequacy and accuracy of the data for further analysis. The measurement model test was carried out using the Smart-PLS 3.0 software.

#### 1. Validity Test

Ghozali (2014) explains that the AVE value of each variable must show a score above 0.5, which means that the data on all variables is declared valid.

**Table 3.** Validity Test Results Based on AVE

Variable	AVE Value
<i>System Quality</i>	0.555
<i>Information Quality</i>	0.785
<i>Service Quality</i>	0.600

<b>Variable</b>	<b>AVE Value</b>
<i>User Satisfaction</i>	0.674
<i>Intention to Use (Use)</i>	0.746
<i>Net Benefits</i>	0.766

Notes: Primary Data Processed (2021)

In table 3 the quality variable has an Average Variance Extracted (AVE) value of 0.555, the service variable is 0.600, the satisfaction variable is 0.674, the user variable is 0.746, the benefit variable is 0.766 and the information variable is 0.785.

## 2. Reliability Test

Table 4 shows that the composite results and Cronbach's alpha values of all the variables tested in this study were declared reliable. Sharma (2016) states that if all latent variables have composite reliability and Cronbach's alpha above 0.7, the research data is declared reliable.

**Table 4.** Composite Reliability Test Results and Cronbach's Alpha Test

<b>Variable</b>	<b>Composite Reliability</b>	<b>Cronbach's Alpha</b>	<b>Remark</b>
<i>System Quality</i>	0,877	0,834	<i>Reliable</i>
<i>Information Quality</i>	0,948	0,931	<i>Reliable</i>
<i>Service Quality</i>	0,743	0,798	<i>Reliable</i>
<i>User Satisfaction</i>	0,921	0,888	<i>Reliable</i>
<i>Intention to Use (Use)</i>	0,910	0,875	<i>Reliable</i>
<i>Net Benefits</i>	0,907	0,844	<i>Reliable</i>

Notes: Primary Data Processed (2021)

## 3. Model Feasibility Test

The Goodness of Fit (GoF) index value approach was carried out to test the feasibility of the model in this study by finding the R<sup>2</sup> value of the dependent variable and the Average Variance Extracted (AVE) value on each latent variable (Tenenhaus, et. al, 2004). The results of the model feasibility test carried out twice can be seen in Table 5.

**Table 5.** Results of Model Feasibility Test with H7a

<b>Latent Variable</b>	<b>Number of Indicators</b>	<b>AVE</b>	<b>Weighted Sum</b>	<b>R<sup>2</sup></b>	<b>GoF</b>
<i>System Quality</i>	6	0.555	3.33		
<i>Information Quality</i>	6	0.785	4.71		
<i>Service Quality</i>	4	0.6	2.4		
<i>User Satisfaction</i>	4	0.746	2.98	0.620	
<i>Intention to Use (Use)</i>	3	0.674	2.02	0.530	
<i>Net Benefits</i>	5	0.766	3.83	0.634	
<b>Total</b>	<b>28</b>		<b>19.276</b>	<b>1.784</b>	
<b>Average</b>			<b>0.688</b>	<b>0.595</b>	<b>0.6398</b>

Notes: Primary Data Processed (2021)

The GoF value in the model feasibility test results shows a value of 0.6398. These results show that 63.98% of the variation in the model can be explained by the sample data of this study. The R<sup>2</sup> value of 0.595 is the average result of the R<sup>2</sup> value of the intentions to use a variable of 0.620, the user satisfaction variable of 0.530, and the net benefit variable of 0.634.

**Table 6.** Model Feasibility Test Results with H7b

Latent Variable	Number of Indicators	AVE	Weighted Amount	R <sup>2</sup>	GoF
<i>System Quality</i>	6	0.555	3.33		
<i>Information Quality</i>	6	0.785	4.71		
<i>Service Quality</i>	4	0.6	2.4		
<i>User Satisfaction</i>	4	0.746	2.98	0.758	
<i>Intention to Use (Use)</i>	3	0.674	2.02	0.531	
<i>Net Benefits</i>	5	0.766	3.83	0.634	
Total	28		19.276	1.923	
Average			<b>0.688</b>	<b>0.641</b>	<b>0.6643</b>

Notes: Primary Data Processed (2021)

The GoF value in the model feasibility test results shows a value of 0.6643. These results indicate that 66.43% of the variation in the model can be explained by the sample data of this study. The R<sup>2</sup> value of 0.641 is the average result of the R<sup>2</sup> value of the intentions to use a variable of 0.758, the user satisfaction variable of 0.531, and the net benefit variable of 0.634.

**Table 7.** Hypothesis Testing Results with Model H7a

	Hypothesis	Original Sample	St. Dev	t-statistics	p-values	
<i>quality-use</i>	1	0.143	0.060	2.372	0.118	Positive, not significant
<i>quality-satis</i>	2	0.034	0.061	0.559	0.006	Positive, significant
<i>inform-use</i>	3	0.450	0.082	5.486	0.000	Positive, significant
<i>inform-satis</i>	4	0.171	0.093	1.843	0.016	Positive, significant
<i>service-use</i>	5	0.032	0.030	0.362	0.017	Positive, significant
<i>service-satis</i>	6	0.373	0.364	3.917	0.000	Positive, significant
<i>use-satis</i>	7a	-0.127	-0.115	1.104	0.270	Negative, not significant
<i>use-benefit</i>	8	0.683	0.661	6.590	0.000	Positive, significant
<i>satis-benefit</i>	9	0.902	0.904	9.639	0.000	Positive, significant

Notes: Primary Data Processed (2021)

**Table 8.** Hypothesis Testing Results with Model H7b

	Hypothesis	Original Sample	St. Dev	t-statistics	p-values	
<i>quality-use</i>	1	0.069	0.099	4.848	<b>0.193</b>	Positive, not significant
<i>quality-satis</i>	2	0.129	0.065	1.978	0.048	Positive, significant
<i>inform-use</i>	3	0.176	0.071	2.487	0.013	Positive, significant
<i>inform-satis</i>	4	0.480	0.099	1.843	0.000	Positive, significant
<i>service-use</i>	5	0.209	0.074	2.817	0.005	Positive, significant
<i>service-satis</i>	6	0.288	0.119	2.409	0.000	Positive, significant
<i>satis-use</i>	7b	0.118	0.111	2.817	0.026	Positive, significant
<i>use-benefit</i>	8	0.570	0.102	5.594	0.000	Positive, significant
<i>satis-benefit</i>	9	0.892	0.103	8.644	0.000	Positive, significant

Notes: Primary Data Processed (2021)

### 4.3. Hypothesis Test Results

SEM was run on the data twice due to the inability of the SEM software to handle the two-way relationship between the two constructs (system use and user satisfaction), one run for the model with H7A (system use and user satisfaction) and the other with H7B (user satisfaction and system use). Overall, the fit of De Lone & McLean's e-commerce model is quite good, indicating that it has great potential for an e-commerce research framework. In both analyzes, it was found that 2 of the 9 hypotheses were not significant, of which one of the two hypotheses was negative and not significant.

### 4.4. Discussion

The results of hypothesis testing with models 7a or 7b showed the same results. H1 is not accepted which means that system quality does not affect the intention to use (use). System quality is expected to provide more value for consumers to visit e-commerce company websites. However, it turns out that the system quality available in the form of reliability, adaptability, and ease of access when used does not affect the intensity of consumers to visit certain e-commerce websites to increase. This result is the same as the research conducted by Angelina et.al., (2019) which states that system quality does not have a significant relationship to use. In their research, they argue that although e-commerce has advantages in system quality, it does not have a significant impact on the use of e-commerce because of the trust factor. Chong et.al., (2010) in their first research model also stated that these two variables did not have a significant relationship. An organization should focus on the quality of the information in a web service.

The relationship of system quality to use can be affected by the novelty of the system. Marjanovic et.al., (2016) explained that the relationship between system quality and intention to use (use) can be influenced by factors in the development of information systems in internal e-commerce. For example, every e-commerce must have a system that can continue to grow. There need to be new potentials that can increase the success of e-commerce which aims to increase the level of usage.

Based on the results of subsequent studies that H2 is accepted which means that system quality has a significant effect on user satisfaction. The significance of testing this hypothesis can be interpreted that the higher the quality of the website system, the more user satisfaction will increase. This study has the same results

as research from Angelina et.al., (2019) and Chong et al., (2010) where users of e-commerce websites assess the quality of the system based on the system is easy to use or not, the system can convey the information needed or does not take a long time is an indicator for users of the quality of the system in question. If these indicators have been met, the user will feel satisfied with the system.

Chong et al., (2010) also emphasize that the factors that cause system quality to significantly affect user satisfaction are convenience and system integration. As we already know, e-commerce today has developed rapidly and is increasingly integrated into the system, which is very useful and helpful for users.

In the third hypothesis test, it was found that there was a significant influence between information quality and intention to use (use). The significance of testing this hypothesis can be interpreted that the higher the quality of the information provided by the website, the intention to use the service will increase. Ong & Ruthven (2009) in their theory argues that the quality of information can be interpreted as measuring the quality of the content of the information system which can be seen from the accuracy of information, timeliness, and relevance of information.

The accurate and precise quality of information will provide a better experience for users. So that when users feel that when the information needed can be met properly, the user's intention to use these services, whether using the website, will increase. Angelina et.al., (2019) explains that the intention to use the service is closely related to the provision of good quality information so that later it will form a sense of satisfaction with the products offered.

The test results show that H4 is accepted which means that information quality has a significant effect on user satisfaction. This shows that if the quality of information is getting better and more complete, then customer satisfaction will increase. Angelina et.al., (2019) explains that providing clear information will provide satisfaction for customers. Yandi & Septrizola (2019) in their research explain that the quality of information is one of the keys to success in increasing the satisfaction felt by consumers when opening certain e-commerce company websites.

The quality of information provides a shopping experience of its own in the era of industrial technology as it is today. The element of information quality becomes the greatest value for the formation of user satisfaction so that if the information provided to consumers is inaccurate or not by the actual state of the product, it will give distrust or dissatisfaction with these services.

In testing the fifth hypothesis, it explains that service quality influences the intention to use these services. The better the quality of service, the higher the intention to use it. So that the third hypothesis is accepted. This study has similar results conducted by Angelina et.al., (2019) and Chong et.al., (2010).

They argue that good service quality will increase the intention to use these services. This is because services that have good capabilities and experience are believed to be able to solve user problems if there are obstacles or complaints. For example, customer care services that can be contacted 24 hours a day are ready to help at any time.

Subsequent testing states that service quality has a significant influence on customer satisfaction. So it can be interpreted that hypothesis 6 is accepted. This study explains that if the quality of service increases, then customer satisfaction will also increase. Chong et.al., (2010) have the same research results. In theory, it is explained that user satisfaction is largely determined by the quality of

information and services. So that all service companies must focus on providing clear information and services. Especially if the service company has a B2C (business to consumer) focus (Angelina et.al., 2019). Although several other studies have stated that these two variables have no effect, Kotler & Keller (2016) state that service quality is a factor that influences customer satisfaction.

The results of testing hypothesis 7a state that the intention to use variable is negative and does not have a significant effect on user satisfaction. In this study, it is stated that the p-value is 0.270 where the value is greater than 0.05 which proves that the intention to use does not affect user satisfaction. So this hypothesis is rejected. As explained in the previous test results that user satisfaction is influenced by several factors including service quality and information quality.

The results of hypothesis testing with the H7b model are accepted, which means that user satisfaction affects intention to use (use). User satisfaction is expected to provide more value for consumers to visit e-commerce company websites. Angelina et.al., (2019) and Chong et.al., (2010) also have a similar opinion. Their findings also complement the theoretical statement of De Lone and Mc. Lean (2004) which explains that user satisfaction is the goal of measuring user opinions on an e-commerce system and must cover the entire user experience cycle while using e-commerce services. Satisfaction can be linked to future transactions that will influence the decision to reuse the system or not. So some previous research results concluded that satisfaction has a big influence on intentions to use e-commerce systems.

Based on the results of subsequent studies that H8 is accepted which means that intention to use has a significant effect on net benefits. The significance of testing this hypothesis can be interpreted that the higher the user's intention to use the system, the more net benefits will increase. This result is also supported by research by Angelina et.al., (2019) which states that users will feel the net benefits of the product because of the support from the user's intention to use the system.

This result is similar to the research conducted by Wu & Wang (2006) which showed that if there is a perceived net benefit of using e-commerce, then this will affect usage but on the contrary, if there is no perceived benefit then the use of the system will not be affected.

The test results show that H9 is accepted which means that user satisfaction has a significant effect on net benefits. This shows that the net benefit is strongly influenced by the increase in customer satisfaction. The results of this study are the same as Angelina et.al., (2019) and Chong et.al., (2010) which states that user satisfaction provides value for achieving the net benefits of an e-commerce service system. De Lone and Mc. Lean (2004) explain that customer satisfaction is one of the most important indicators in terms of achieving net benefits. The existence of e-commerce makes users' lives easier, more time-saving, productive, and effective. The more users who feel the more benefits they get, the higher the satisfaction of e-commerce users. Chong et.al., (2010) stated in their research that the explanation for the weak relationship between the use of this system in the model would be either misspecification or just a representation of a real phenomenon, or would be both.

## 5. CONCLUSION

Based on this study, with the De Lone and Mc. Lean model, there is a significant influence between system quality and user satisfaction, information quality and intention to use, information quality and user satisfaction, service quality and intention to use, service quality, and user satisfaction, user satisfaction and intention to use, intention to use and net benefits, user satisfaction and net benefits. Most of these models show a model fit that is also able to test the use of e-commerce in the Special Region of Yogyakarta.

On the other hand, there is no influence, namely system quality and intention to use and intention to use does not have a significant effect on user satisfaction, which means that the intention to use e-commerce services for users in the Special Region of Yogyakarta is not only due to the quality of the system owned by e-commerce services. Likewise, the satisfaction of users of e-commerce services for users in the Special Region of Yogyakarta is not influenced by intention to use. So that companies engaged in e-commerce services can focus on achieving net benefits by paying attention to the variables of customer satisfaction, service quality, and system quality.

One of the limitations faced by researchers is the inability to measure the reciprocal relationship between intention to use and user satisfaction in a structural equation modeling analysis. This could be due to an error in the model specification. SEM was unable to measure two-way relationships (H7a and H7b) simultaneously in one analysis, failing to represent the original conceptual relationship in the DeLone & McLean e-commerce model. Further research can use other structural equation modeling analysis tools to obtain other results.

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