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Antecedents and Consequence of Service Quality of Online Transportation

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Abstract
The purpose of this study is to test speed of service, ease of use, reliability, enjoyment, privacy/safetyy, billing system, and control of the self-service online transportation as of antecedents of service quality, and customer loyalty intentions as of its consequence at once. A quantitative research design, using multiple regression statistical techniques, facilitated the data analysis. The sample consisted of 176 sophomore students' class 2020 from a private university in Jakarta, Indonesia who has basic knowledge of transportation and logistics. Data were received through survey by using online questionnaire. The results indicated all antecedent variables have positive and significant relationship with service quality. The best technological service predictor of service quality is billing system with 41% adjusted R^2 and the smallest predictor is ease of use with 4% adjusted R^2. Service quality variance can be explained 52% by all antecedent variables simultaneously, whereas loyalty intentions variance is explained 22% by service quality.
Keywords: Antecedents; Consequence; Service Quality; Loyalty Intentions; Online Transportation
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1 Introduction

Online transportation service is one of mobile commerce which its major business is carrying people or goods from one place to another by car or bike using mobile technology. It is operated in several big cities in Indonesia since 2015, and developed continuously. There are several application owners who run the business in Indonesia such as Grab, Gojek and Shopee, which recruits drivers as operators or *mitra* doing the business. The business provides not only people and goods transportation services; it includes house cleaning, mart, shop, goods, documents and food delivery services.

Starts in the early 2020 and still continuing in this early 2022, Indonesia has been caught any impact COVID-19 which is the global pandemic incurred. It is evidenced by some restrictions on mobility and activities. People do working from home, online class, and going out only there are needs urgently. People choose to use it as public transportation because of time efficiency as the primary rationale. This online transportation acts as public transportation in Indonesia, despite still no regulation attached but operational permission. According to Statqo Analytics data in (Yanti, 2021), online transportation users have been decreased 28-35 percentage in late March 2020. Although the ride service is decreased due to people restrictions, goods and foods delivery services still can be operated. Here, online transportation function becomes real.

Evaluation of public transport services, such as road services directs to service quality as a relevant issue (Bellizzi, Eboli, & Mazzulla, 2020), for example there should be improvement periodically in order to satisfy customers. Service quality in online transportation provides on time goods and foods delivery or pick passenger up. Studies regarding service quality of online transportation especially in Indonesia have explored service quality fragmentary study, such as focused on the technology aspect of service quality (Silalahi, Handayani, & Munajat, 2017), impact of service quality on repurchase intentions ((Djaharuddin, 2021);(Leonnard, Comm, & Thung, 2017)), and impact of service quality to some variables, i.e. customer satisfaction, trust, and customer loyalty (Sevenpri, Valtin, & Agustine, 2019). Based on these previous outcomes, this study emerges to address the importance of integration study regarding factors affecting service quality of online transportation and the consequence.

Mobile commerce (m-commerce) is another new type of e-commerce transactions, carried it out by mobile devices with wireless telecommunications networks (Siau, Lim, & Shen, 2001). (Varshney & Vetter, 2002) proposed a framework for m-commerce consists of developer and provider plane, user plane, mobile commerce applications, wireless user infrastructure, mobile middleware, wireless network infrastructure, application developer, content provider, and service provider. Self-service online transportation is one of m-commerce development was first introduced by Uber as of on-demand mobile service for transportation (Smith, 2016). The success of this business model through using technology can unlock the barrier of global economy growth. The critical elements of this business model are not only a personal service but also consumer goods service, and its on-demand mobile service that available anywhere, anytime.

Study the role of service quality in consumer evaluation of technology-based self-service options is

important, i.e. online transportation. Difficulty in using the technology can fail spirit of this online transportation emerging. Pandemic COVID-19 may make many people use it cause of restriction condition. However, living is going back to norm now. Online transportation will be back the norm also; expected user's intention to remain to use the service repeatedly is very thorough. Hence, learning how to improve online transportation service quality in order to gain customers remain to use it in the norm is necessary. Activities depend on technology need to ensure easiness of technology deployment which were not be frustrated impact, relatively at least same cost of time and money doing the same activities conventionally, and safeties of the user data. Hence, the primary objective of this study is to test speed of service, ease of use, reliability, enjoyment, privacy/safety, billing system and control of the online transportation application as antecedents of service quality, and customer loyalty intentions as its consequence at once.

2 Literature Review

The study is a replication (Shamdasani, Mukherjee, & Malhotra, 2008) study that did empirically testing a comprehensive antecedents and consequences of service quality in technology-based self-service context of Internet banking. The study did this in order to see generalization of the theory in online transportation context, and applied Technology Acceptance Model (Saadé & Bahli, 2005) as theory based. The antecedents consist of seven variables rather than (Shamdasani et al., 2008) which have five antecedents. The additional variables are privacy/safety and billing system. However, the study only tested loyalty intentions as the consequence of service quality rather than (Shamdasani et al., 2008) that tested perceived value and satisfaction also as the consequences. The rationale is because the background of study would like to know mostly on consumer's behave to keep use online transport in norm after COVID-19 era.

Speed of service is predicted could be a determinant of service quality (Shamdasani et al., 2008) because believe it can reduce delivery time. Therefore, hypothesis (H1) states perceived speed of service of the self-service online transport resource has positive impact on perceived service quality.

Ease of use is predicted could be a determinant of service quality (Shamdasani et al., 2008) because if consumers feel easy to use the technology, i.e. smart phone then consumers will view getting service quality. Hence, hypothesis (H2) states perceived ease of use of the self-service online transport resource has positive impact on perceived service quality.

Reliability is predicted could be a determinant of service quality because result from of extensive studies confirms reliability is an important factor for service quality ((Zeithaml, Berry, & Parasuraman, 1988);(Shamdasani et al., 2008)). Hence, hypothesis (H3) states perceived reliability of the self-service online transport resource has positive impact on perceived service quality.

Enjoyment is predicted could be a determinant of service quality (Shamdasani et al., 2008) because suggestion from several studies to add enjoyment as an individual cognitive absorption in technology acceptance model. Hence, hypothesis (H4) states perceived enjoyment of the self-service online transport resource has positive impact on perceived service quality.

Privacy/safety is predicted could be a determinant of service quality (Parasuraman, Zeithaml, & Malhotra, 2005) because the factor as the indicator of this dimension influence quality significantly, even though privacy is not the critical of electronic service quality dimensions. Hence, hypothesis (H5) states perceived safety of the self-service online transport resource has positive impact on perceived service quality.

Billing system is predicted could be a determinant of service quality (Lim, H., Widdows, R., & Park, 2006) because billing system as functional service attribute has a significant influence on perceived emotional value. Hence, hypothesis (H6) states perceived billing system accuracy of the self-service online transport resource has positive impact on perceived service quality.

Control is predicted could be a determinant of service quality (Shamdasani et al., 2008) because some studies agree control is important, especially control can produce consumer feels can get the intended service (Bateson, 1985; Bowen, 1986). Hence, hypothesis (H7) states perceived control in using the self-service online transport resource has positive impact on perceived service quality.

Based on the background, the study would like to know mostly on consumer's behavior to keep use online transport in norm after COVID-19 era. Therefore, the study will seek more information regarding loyalty intentions as consequence of perceived service quality as per recent experience. Logical relationship of perceived service quality can be modeled and tested in various service situations (Jacoby, Olson, & Olson, 1985). Several studies agree loyalty is an important behavioral consequence of service quality ((Zeithaml, Berry, & Parasuraman, 1996);(White, 2006)). Retention customers could become a measuring instrument for companies to know the financial impact of service quality (Zeithaml et al., 1996). Customer loyalty was considered be the primary factor to be increased in online transportation services future strategy (Basalamah, Haerdiansyah Syahnur, Ashoer, & Faisal Bahari, 2020). Loyalty might be expressed in preference for a company, remaining buy its product, or enlarging business with it in future (Zeithaml et al., 1996). As loyalty is the customers' decision to continue buying the online transportation services from buying past experience, then it may be

approved from better service quality. Loyalty intentions is predicted could be consequence of service quality (Shamdasani et al., 2008) because of result from some studies that service quality has significant positive relationship with repurchase intention on online transportation (Leonnard et al., 2017) and study about good moods on service quality confirms it is a predictor of loyalty (White, 2006). Hence, hypothesis (H8) states perceived value of the self-service online transport resource has positive impact on intention to continue to use the resource.

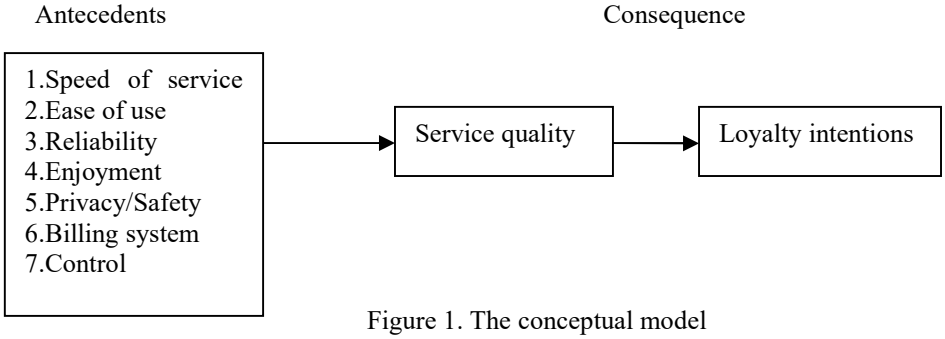

Figure 1. The conceptual model

3 Method

Information gathered on online transportation use and experience from youth Internet user 18-20 years old, i.e. sophomore students year 2021. Selection based on the dominant cluster from survey conducted by Internet service association in Indonesia, Asosiasi Penyelenggara Jasa Internet Indonesia (APJII) in 2019-2020 which Internet user in cluster 15-19 years old is 91 percent and 20-24 years old is 88,5 percent (https://apjii.or.id/). In particular, the study intends to answer the questions what are the role of speed of service, ease of use, reliability, enjoyment, safety, billing system, and control of online transport application as of the antecedents of its service quality. The study tried to answer that is the customers' loyalty intentions as of the consequence of the online transport service quality also.

The online transports considered were Grab, Gojek and Shopee. A survey approach was adopted. The survey was conducted on a sample of 176 from 574 sophomore students year 2021, presently studying in an educational institution of transportation and logistics in Jakarta Indonesia. It is 31 percent response rate. According to (Neuman, 2000) this response rate is sufficient. This sample is well known smart phone user and has transportation and logistics basic knowledge as a basis to fill in the questionnaire. The questionnaire is based on the Likert seven-point scale methods. It was used to analyze perceptions of what level is the online transport service quality, and the usefulness interpretation of speed of service, ease of use, reliability, enjoyment, safety, billing system, and control of online transport application. It was also used to investigate the extent of customers' loyalty intentions. A pilot test on the questionnaire did in order to modify the ambivalence.

Interpretation of findings is based on statistical analysis, linear model approval with classic assumption test and hypothesis test with linear regression. The study attempts to discover the usefulness extension of speed of service, ease of use, reliability, enjoyment, safety, billing system, and control of online transport application and the influence on service quality as perceived by the sophomore students as the application user. Another endeavor is to determine the influence of service quality on customers' loyalty intentions. The conceptual framework applied is based on (Shamdasani et al., 2008)).

In order to measure the variables, the operational definitions have been wrote in Table 1. As the predictors or antecedents of service quality are speed of service, ease of use, reliability, enjoyment, privacy/safety, billing system and control. Loyalty intentions role is the consequence of service quality.

Table 1. Operational Definition of Variables

Variables	Definition	References
Speed of service	Time using the online transportation application	(Shamdasani et al., 2008)
Ease of use	Extent of easiness using the online transportation application	(Shamdasani et al., 2008)
Reliability	Extent of the online transportation services accuracy	(Shamdasani et al., 2008)
Enjoyment	Extent of interest using the online transportation application	(Shamdasani et al., 2008)
Privacy/Safety	Extent of consumer trust that the online transportation application is safe from intrusion and is protected consumer personal information	(Parasuraman et al., 2005)
Billing system	Extent of consumer satisfaction on billing accuracy and problem solution that provided by the online transportation application	(Lim, H., Widdows, R., & Park, 2006)
Control	Extent of consumer's control when the online transportation application service process in progress	(Shamdasani et al., 2008)

Variables	Definition	References
Service quality	Consumer's perception regarding quality of the choice to use the online transportation	(Shamdasani et al., 2008)
Loyalty intentions	Consumer's intention to use the online transportation repeatedly	(Shamdasani et al., 2008)

4 Results and Discussions

First step of the study was to ensure the quality of data by using factors analyzing for validity and Cronbach alpha (α) for reliability. The results are revealed that all constructs of speed of service, ease of use, reliability, enjoyment, privacy or safety, billing system, control, service quality, and loyalty intentions have value of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) larger than 0,50, Bartlett's Test of Sphericity (BTS) with *p* smaller than 0,05, and variance larger than 50%. The smallest KMO-MSA value 0,579 was found on billing system whilst the smallest variance 51,13 was found on loyalty intentions. The smallest range of factors loading for the items all constructs were 0,577-0,854 was found on control with the 0,577 lower bound, and 0,679-0,734 was found on speed of service with the 0,734 upper bound. The results show the items of questionnaires are valid and can be continued to proceed.. Meanwhile, the results of reliability measurement showed the smallest alpha was 0,738 for billing system. The smallest item-total correlation of construct is 0,455 for one of billing system item which is "application provides accurate billing". These findings mean all questionnaire items are consistence and can be used to measure the constructs.

The study has 176 youth Internet user 18-20 years old respondents which categorized into three descriptions such as gender, monthly pocket money, and the online transportation using frequency. Respondents consist of 48,9% female and 51,1 male. Almost all respondents have monthly pocket money as amount below IDR three millions or 85,8%, between IDR three millions to four millions 5,7%, and above IDR four millions 8,5%. Another profile respondent is their frequency using online transportation in a week that 74,4% doing once a week, 13,6% doing twice to five times a week, and 11,9% doing more than five times a week.

Last but not least, the results of hypotheses test were summarized in Table 1. The study replicates and modifies (Shamdasani et al., 2008) antecedents and consequences of service quality model. It tests eight hypotheses that is seven hypotheses test seven constructs as the antecedents of online transportation quality service and one hypothesis tests one construct as the consequence. The essential goal does it to get more generalization of variables affected service quality on technology-based self-service industries, especially for online transportation.

Table 2. Summary Hypotheses Test Results

Hypothesis	t-values	F-values	Adjusted R^2	Supported/Unsupported
H1: Speed-Quality	3,821*		0,236	Supported
H2: Easiness - Quality	2,875*		0,040	Supported
H3: Reliability – Quality	6,861*		0,333	Supported
H4: Enjoyment - Quality:	4,119*		0,266	Supported
H5: Safety – Quality	2,914*		0,145	Supported
H6: Billing – Quality	5,592*		0,408	Supported
H7: Control – Quality	5,104*		0,363	Supported
H8: Quality – Loyalty	3,633*		0,217	Supported
Speed, Easiness, Reliability, Enjoyment, Safety, Billing, Control - Quality		7,808*	0,520	Supported

Statistics results were founded all hypotheses are supported (Table 1) and the supported criteria describe in Figure 2. These mean speed of service, ease of use, reliability, enjoyment, privacy/safety, billing system, and control affect service quality. Hypothesis (H1) states perceived speed of service of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of speed of service with service quality. Statistics result was founded t-value 3,821 significant at $p < 0,05$ means speed of service affect service quality positively and significantly. Adjusted R^2 is 0,236 means 24% service quality variance can be predicted by speed of service.

Hypothesis (H2) states perceived ease of use of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of ease of use with service quality. Statistics result was founded t-value 2,875 significant at $p < 0,05$ means ease of use affect service quality positively and significantly. Adjusted R^2 is 0,040 means 4% service quality variance can be predicted by ease of use.

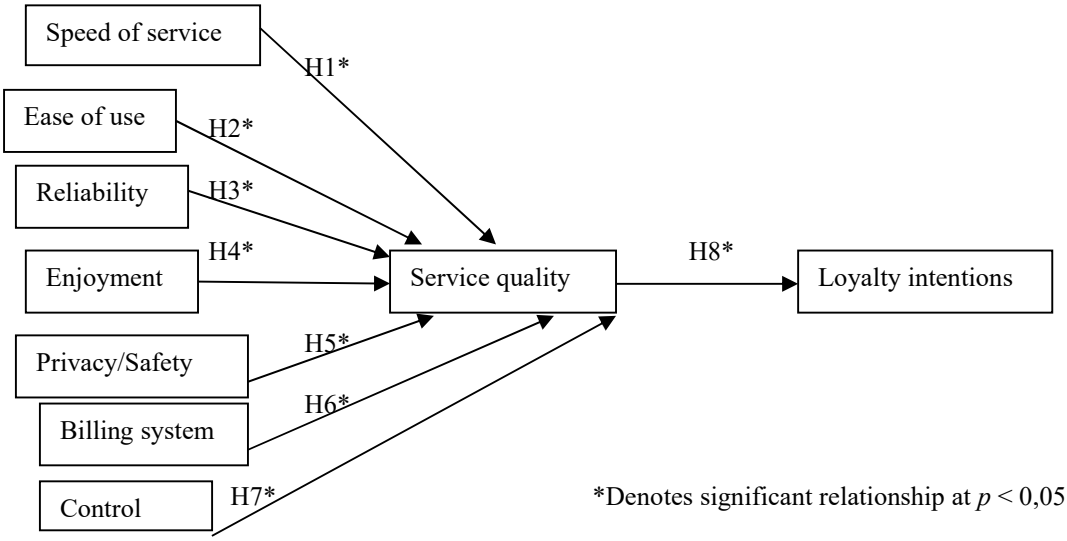

Figure 2. Hypotheses Criteria of Antecedents and Consequence

Hypothesis (H3) states perceived reliability of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of reliability with service quality. Statistics result was founded t-value 6,861 significant at $p < 0,05$ means reliability affect service quality positively and significantly. Adjusted R^2 is 0,333 means 33% service quality variance can be predicted by reliability.

Hypothesis (H4) states perceived enjoyment of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of enjoyment with service quality. Statistics result was founded t-value 4,119 significant at $p < 0,05$ means enjoyment affect service quality positively and significantly. Adjusted R^2 is 0,266 means 27% service quality variance can be predicted by enjoyment.

Hypothesis (H5) states perceived safety of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of privacy/ safety with service quality. Statistics result was founded t-value 2,914 significant at $p < 0,05$ means safety affect service quality positively and significantly. Adjusted R^2 is 0,145 means 15% service quality variance can be predicted by privacy/ safety.

Hypothesis (H6) states perceived billing system accuracy of the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of billing service with service quality. Statistics result was founded t-value 5,592 significant at $p < 0,05$ means billing system accuracy affect service quality positively and significantly. Adjusted R^2 is 0,408 means 41% service quality variance can be predicted by billing system.

Hypothesis (H7) states perceived control in using the self-service online transport resource has positive impact on perceived service quality. This hypothesis shows relationship of control with service quality. Statistics result was founded t-value 5,104 significant at $p < 0,05$ means control affects service quality positively and significantly. Adjusted R^2 is 0,363 means 36% service quality variance can be predicted by control.

Hypothesis (H8) states perceived value of the self-service online transport resource has positive impact on intention to continue to use the resource. This hypothesis shows relationship of service quality with loyalty intentions. Statistics result was founded t-value 3,633 significant at $p < 0,05$ means service quality affect loyalty intentions positively and significantly. In other words, service quality has role to increase consumer's attention to use online transportation in future. Adjusted R^2 is 0,217 means 22% loyalty intentions variance can be predicted by service quality.

Additional statistics result is F-value as amount 7,808 significance at $p < 0,05$ means speed of service, easy for use, reliability, enjoyment, privacy or safety, billing system, and control affect service quality simultaneously. Adjusted R^2 is 0,520 means 52% service quality variance can be explained by all antecedents variable simultaneously.

Online transportation services as one of technology-based self-service industries have turned to develop from personal service into consumer goods recently. Its development shows its importance in digitalized era. Customers can reserve and get services instantly through technology. Then, technology service components are crucial to gain good services.

This study replicates (Shamdasani et al., 2008) antecedents and consequences of service quality model in order to view its generalization for self-service online transport, and supports them. All antecedent factors replicated from (Shamdasani et al., 2008) i.e. speed of service, ease of use, reliability, enjoyment, and control are significant. Ease of use is the smallest predictor with adjusted R^2 0,04, meanwhile (Shamdasani et al., 2008) results showed that ease of use was not supported. The explanation is because respondents were well educated

and familiar with smart phone using, so it could be the reason why they didn't have problem with ease of use. Similar with this study, the respondents are well educated, young students that have transportation and logistics knowledge. The rationale is respondents see ease of use is not superior to service quality.

This study found 22% loyalty intentions variance can be explained by service quality, bigger result than (Shamdasani et al., 2008). This result answered the study research questions regarding the possibility consumers still doing business with online transport to fulfill the movement and logistics needs in the norm after COVID-19 restriction.

The study added billing system as of the antecedent factors into antecedents and consequence model, and found billing system is the best predictor of service quality (41%) bigger than control (36%) which in (Shamdasani et al., 2008) control is the best predictor. A possible reason is consumers don't like to have transaction with payment problem.

The major limitations of the study were the sample size and only test loyalty intentions as for the consequence. Number of sample in the study is 176 sophomore students from the institution of higher education in Jakarta, capital city of Indonesia which have transportation and logistics competence which could be limitation of study. Therefore, this study recommends getting sample more varying, i.e. housewives or employees in order to have thorough results and understanding.

The study only test loyalty intentions as the consequence of service quality rather than (Shamdasani et al., 2008) also tested perceived value and satisfaction together with continued interaction as the consequences, because the primary research question of the study is would like to know how the extent of consumer behavior to keep continuing use online transportation in norm after COVID-19 era. This becomes another limitation of the study. Hence, another suggestions for future study are to include possible other consequences of service quality in order to have more comprehensive results, and to apply the suitable analysis data technique for the condition such as structural equation modeling.

5 Conclusion and Implications

The aim of the study was to test speed of service, ease of use, reliability, enjoyment, privacy/ safety, billing system, control as for the antecedents of service quality of self-service online transportation, and loyalty intentions as for the consequence. A statistical result showed all hypotheses were supported with billing system is the best predictor. Construct variance sequence are billing system, control, reliability, enjoyment, speed of service and ease of use consecutively.

In conclusion, three key points emerge from this study: 1) The study generalizes the antecedents and consequence model understanding of technology-based self-service industries; 2) The responsibility of management to create and sustain the effective and efficient billing system application which support the self-service Internet technologies; and, 2) Ease of use appears to be the least predictor of self-service Internet technologies emerge more questions to answer.

Theoretical implications of the study enrich Technology Acceptance Model (TAM) through gain understanding technological factors affecting service quality. In addition, the study gives more insights in electronic service quality model also. After all the study contributes more in general service quality model.

Restrictions due to COVID-19 could be act the simulation of self-service online transportation and the measurements how far company will gain digitalize life successful in future. This could be follow by progress of the wealth every stakeholder involved. Hence, the study will help management to arrange the steps to increase possibility improvement customer's evaluation regarding the service quality across technological service components. This opinion based on the study result that 45% online transport consumer recently intend to use online transport when there are needs for transportation and logistics. Besides, consumer's evaluation on technology-based service quality indicated 52% good service will increase the intention to be actively doing online transportation transaction. So, this study could help management to create any development for self-service online transportation. .

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