

INFLUENCE OF QUALITY OF ONLINE TRANSPORTATION SERVICE TO CUSTOMER SATISFACTION AND LOYALTY

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Abstract- The development of the transportation industry, which is heading towards the digital era, is a growing industry today. Many online transportation businesses exist today. It certainly affects the competition between online transportation businesses, so the quality of service becomes a competitive strategy. The study aimed to analyze the impact of quality of service on customer satisfaction and loyalty using the Structural Equation Modeling (SEM) method by AMOS software. The results of the research that have been tested based on the hypothesis. Based on the value of the t table $>$ t -table with DF 40 at a significance level of 5% with a critical value of 2.423, The study results confirm the acceptance and validation of hypotheses $H1$ and $H2$, establishing that quality of service significantly and positively influences customer satisfaction and loyalty. It is expected to be input for the company and can be a source of information in policy making. Conclusion that customer satisfaction and loyalty in choosing and using Online transportation services are influenced by quality of service. This also explains that with good quality of service and fast in handling customer needs, it can bring loyal customers.

Keywords: Quality of Service, Customer Satisfaction, Customer Loyalty, Structural Equation Modeling (SEM), Online Transportation.

1. INTRODUCTION

Transportation plays an essential role in supporting the economic and social activities of the community because it helps the movement of individuals and goods to various places to meet the needs of goods and services and provides employment opportunities for many people. This makes transportation one of the supporting facilities for the community in carrying out their life activities [1]. Currently, the development of technology is also increasingly needed to facilitate humans in carrying out various activities. With the existence of technology, it can make it easier for users to do things faster. The easier it is to access the internet to find information or news, access social media to communicate without distance and time limits, to the ease of making transactions. This can certainly be utilized by the community and also business

people. For example, the online transportation service business sector is a business that has been influenced by technology [2, 3].

Online transportation service provider companies offer online motorcycle taxis as a mode of transportation that is quite attractive to the public. The problems experienced by them are related to complaints about the application, comfort, friendliness, driver cleanliness and vehicle cleanliness. From these complaints, it causes customer dissatisfaction which results in cancellation and decreased ratings from customers. The customers complain about the services they use for various reasons. According to those complaints, the drivers should maintain a good service so that they get a good enough rating or percent so that there is no account suspension and termination of partners. The determining factor of customer loyalty is further influenced by brand image [4]. Brand image is a combination of all existing information about products, services, and companies obtained through direct customer experience. A good brand image affects customers because customers feel satisfied when they use it [5]. A good image attached to Online transportation provider is one of the important factors for customer loyalty. They still have to pay attention to the company's brand image because it still has many shortcomings that must be considered and also improved. Customers believe that an Enterprise with an excellent brand image will offer services that fulfil their needs, wants and expectations [6, 7]

Prior researches showed that quality of service impact positively to customer satisfaction, and quality of service impact positively to customer loyalty. These topics have been explored in many various areas such as manufacturer [8], social media and online shopping [9] [7, 10], Medical Service [11], Tourism [12], and many more. What needs to be considered is that the service and quality of service expected by consumers in each type of industry are different. So, it is necessary to study quality of service more broadly and specifically for various variables and industries. Unfortunately, we have found that there is lack of research about these topics in online transportation sector which is known as one of very popular service industry in this digital era.

There are few studies explore quality of service to the satisfaction of customer and their loyalty in online transportation industry but they did not determine the factors that give significant impact to the relations. An analysis method used to assess quality of service is Structural Equation Modeling (SEM). SEM is a multivariate analysis technique designed to address the limitations of previous multivariate analysis models commonly used in statistical research [13-15]. SEM is utilized to analyze data by examining and validating a model. The indicated models encompass regression analysis, path analysis, and confirmatory factor analysis. These statistical methods are utilized to examine relationships between variables, explore causal pathways, and assess the structure of measurement models. According to the description of these problems, the findings of this research is to determine which indicators of quality of service of the companies providing online transportation services influence significantly to the customer loyalty and consumer satisfaction using the structural equation modeling (SEM) method.

2. THEORY AND HYPOTHESIS

2.1. Structural Equation Modelling (SEM)

SEM is a technical method of Statistical analysis that supports testing a relatively complex series of relationships during analysis. SEM uses statistical techniques to present data to achieve research objectives and can apply many models to answer research problem formulations. According to [16], SEM is a statistical method that has evolved from econometric principles and is now widely used in academic research in management [17]. The method integrates principles from psychology and sociology and includes regression analysis, path analysis, and confirmatory factor analysis [4]. The analysis method used in this research is using SEM (Structural Equation Model). Researchers chose the SEM method because it can display observable concepts and can explain the overall mode. SEM requires computer software where in this study researchers will use Amos version 26.

2.2. Online Transportation Service Era

The transportation industry in Indonesia is currently witnessing heightened competition due to the emergence of online transportation services. Leading mobile applications such as Go-Jek, Uber, and Grab have garnered significant popularity for these services within the country. These platforms wield a significant competitive edge by effectively linking drivers with customers. As a result, the number of online transportation services continues to grow each year, with few application-based services currently operating in Indonesia, one of them is Maxim [18]. Furthermore, the online transportation sector presents a lucrative prospect, aligning with the substantial growth in smartphone users within Indonesia. The prevalence of smartphone users has positioned Indonesia as the foremost smartphone market in the Asia Pacific region, trailing only behind China and India, with a penetration rate of 45.4 percent.

The expansion of online transportation services has been substantial. However, it is important to recognize that this program is not exempt from inherent limitations and associated challenges. The issues faced by online transportation providers were related to complaints about the application, driver friendliness, driver cleanliness, and vehicle cleanliness. The application still needs improvement, such as adding an image-sending feature to in-app chat, updating maps, resolving difficulties in determining pick-up and drop-off locations, and addressing congestion or delays in the application. Additionally, there are negative reviews of drivers exhibiting impolite behavior, including using harsh words, cursing, and getting angry at customers. Customers have also reported receiving unpleasant treatment from online drivers.

2.3. Quality of Service (SQ) and Customer Satisfaction (CS)

Quality of service (SQ), a dedicated effort to meet consumer needs and desires, is instrumental in balancing consumer expectations. As Yum and Yoo [9] concludes, SQ is a series of specific forms of production or service that have the potential to satisfy people's needs and desires. In this context, companies that provide services rely heavily on direct interaction between customers and business actors. The factors of employee behavior, such as attitudes and skills in conveying information, are crucial elements that can significantly impact the SQ [6]. Enhancing quality of service is a key driver of economic competitiveness. This objective can be accomplished by comprehensively analyzing and refining operational processes, expeditiously and systematically identifying issues, constructing precise and dependable service performance measurements, and gauging customer satisfaction levels. By prioritizing these factors, organizations can improve the quality of their services, enhance their competitive edge, and achieve sustained success in the marketplace. The satisfaction of customers is significantly influenced by the quality of service they receive. It is observed that customers tend to express contentment and enjoyment when they are provided with good quality service by employees. Therefore, it is essential for businesses to prioritize quality of service to ensure CS [8].

According to Lupiyoadi Hamdani [19] said that the factors of SQ include the following [7, 19]:

1. Consumer perceptions of the service they directly receive (perceived service).
2. Consumers expectation (expected service):

Customer satisfaction with SQ will shape perceptions according to their assessment. So, there are several indicators used in prior researches that represent CS, namely Service according to customer expectations [8]. Desire to participate in promoting the services [20], Customer Satisfaction Score [21], and Overall customer satisfaction [22].

H1: Quality of service impact significantly to customers satisfaction.

2.4. Quality of Service (SQ) and Customer Loyalty (CL)

The current study is designed to explore the direct impact of SQ on CS, departing from the prevailing focus in prior research on the relationship between SQ and CL, in which CS is a moderating factor. The resulting perception of quality of service, as revealed by this study, holds significant importance in determining CL. Despite the recognized significance of this relationship, the existing literature on the topic remains limited. The current research contributes to the field by providing a comprehensive analysis of the influence of quality of service on customer satisfaction, thereby shedding light on the crucial role of the former in shaping customers' loyalty to a business. Customer loyalty refers to the strong commitment of a customer to continuously subscribe to or purchase specific services in the course of time, despite the impact of various circumstances or marketing campaigns. It has the power to influence consumer behavior. There are several stages of customer loyalty, as identified by [23, 24]. There were few indicators that represent customer loyalty variable such as Intention to reorder the services [20], Upsell Rasio [9], and make it priority opt [11, 25, 26]. H2: Quality of service impact significantly to customers loyalty.

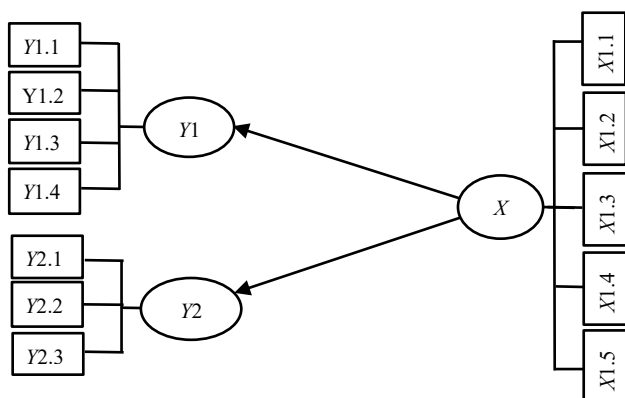


Figure 1. Construct Diagram

Table 1. Variable Information

No	Variables	Variables Name
1	X1	Quality of service
2	X1.1	Safety Riding
3	X1.2	Cleanliness of Vehicles
4	X1.3	Communication between drivers and customers
5	X1.4	The easiness of customers using online application
6	X1.5	The services fulfill the customer expectation
7	Y1	Customer Satisfaction
8	Y1.1	Rate high score for Customer satisfaction score
9	Y1.2	Desire to participate in promoting the services
10	Y1.3	No complaining
11	Y1.4	Comfortless of Customer
12	Y2	Customer Loyalty
13	Y2.1	Intention to reorder the services
14	Y2.2	Upsell Ratio
15	Y2.3	Make it priority opt

2.5. Construct Diagram

There are two hypotheses in this study such as;

- 1) Quality of service impact significantly to customers satisfaction
- 2) Quality of service impact significantly to customers loyalty. According to those hypotheses, we developed construct diagram as a conceptual model of this study as shown in Figure 1.

3. METHODOLOGY

This research was conducted in Indonesia. One of the service companies that are currently developing are four-wheeled and two-wheeled transportation companies known as Maxim. Maxim is an online motorcycle taxi service provider that always improves quality of service and offers competitive prices compared to other transportation services [4, 5].

3.1. Data Collection

Data was obtained by direct observation of the research object. Primary data collection is carried out by making a questionnaire, which is a list containing a series of questions regarding Quality of service, Customer Loyalty, and Customer Satisfaction which aims to obtain relevant information, as well as the information needed simultaneously. While library research is carried out by looking for references on the internet, books, and in prior scholarly works pertaining to quality of service, customer satisfaction, and customer loyalty.

The secondary data such as the opini of customers related to customer satisfaction of Maxim was obtained by searching engine through internet. The data contained on the play store application platform about customer comments or reviews to online drivers that are negative about quality of service, so that they can affect customer satisfaction and loyalty. In 2023, out of 4.070.546 users who use the maxim application in the play store, the rating and reviews of the maxim application are 4.8, the number who commented was 162.821. Various comments about maxim apps and drivers on the play store. The maxim app still has shortcomings such as the image sending feature that is still missing in room chat, maps that are still inaccurate are difficult to determine pick-ups and deliveries, and the application usually experiences congestion or stuttering. As for maxim drivers, there are bad reviews, namely impolite actions such as issuing harsh words, cursing, getting angry at customers and also some customers get unpleasant actions from online drivers. This shows that the quality of service of Maxime is still not optimal for customer satisfaction and loyalty so that it needs to be re-evaluated for improvement or improvement of quality of service.

Data collection was conducted from January 4, 2024 to January 24, 2024. Data was collected using a questionnaire and distributed to respondents through social media. The respondents of this study were diverse, both women and men, different ages, and different occupations. According to gender, the survey included 139 male respondents, accounting for 43,1% of the total, and 261 female respondents, accounting for 56.9%. This does not affect the results of the study because the data is not taken into account in calculating the results of the study and is also

not a respondent criterion that must be met. Based on age, the number of respondents *aged*<17 years totaled 69 respondents by 18%, 18-23 years totaled 222 respondents by 52.6%, 24-29 years totaled 34 respondents by 10%, and >30 years totaled 75 respondents by 19.4%. Based on occupation, the number of student respondents totaled 207 respondents by 47.2%, private employees totaled 62 respondents by 14.1%, students totaled 28 respondents by 6.4%, civil servants totaled 1 respondent by 0.2%, housewives totaled 12 respondents by 2.7%, and others totaled 90 respondents by 29.4%.

3.2. Research Method

The research method uses the Structural Equation Modeling method with several stages of the research process to obtain a systematic research process, the following steps are used, namely the data collection process and data processing [10]. The data processing method used uses the Structural Equation Model or known as SEM using AMOS software. The Stages of Analysis Process were:

- Validity and reliability test
- Confirmatory factor analysis test
- Full structural model confirmatory factor analysis test
- Hypothesis testing

4. RESULT AND DISCUSSION

4.1. Test of Validity and Reliability

Validity testing uses a convergent validity approach. The aim is to determine each indicator's location when estimating research variables. Validity tests are conducted to determine whether the variables used in this study are in accordance with its objectives. The IBM AMOS Version 26 program also provides facilities for assessing convergent validity by looking at each indicator's critical value.

Table 2. The Results of Validity Test

Correlations						
		X1.1	X1.2	X1.3	X1.4	X1.5
X1.1	Sig. (2-tailed)		<0.001	<0.001	<0.001	<0.001
X1.2	Sig. (2-tailed)	<0.001		<0.001	<0.001	<0.001
X1.3	Sig. (2-tailed)	<0.001	<0.001		<0.001	<0.001
X1.4	Sig. (2-tailed)	<0.001	<0.001	<0.001		<0.001
X1.5	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	

Correlations					
		Y1.1	Y1.2	Y1.3	Y1.4
Y1.1	Sig. (2-tailed)		<0.01	<0.001	<0.001
Y1.2	Sig. (2-tailed)	<0.001		<0.001	<0.001
Y1.3	Sig. (2-tailed)	<0.001	<0.001		<0.001
Y1.4	Sig. (2-tailed)	<0.001	<0.001	<0.001	

Correlations				
		Y1.1	Y1.2	Y1.3
Y1.1	Sig. (2-tailed)		<0.001	<0.001
Y1.2	Sig. (2-tailed)	<0.001		<0.001
Y1.3	Sig. (2-tailed)	<0.001	<.001	

The criterion is that if the indicator's *t* value is ≥ 1.96 , then the indicator is significant at the level $\alpha = 0.05$. According to the result of validity test, there are no variables whose significance values are above 0.05. The

values are It states that all variables are valid and in line with the objectives of this study.

Reliability testing is conducted to evaluate the consistency of responses obtained from a questionnaire, thus allowing for an assessment of the reliability of the measuring instrument. In this testing process, the Cronbach's alpha coefficient, calculated through data analysis utilizing the SPSS program, is employed as a method to gauge reliability. A question is deemed reliable if the alpha coefficient exceeds 0.70. Table 3 provides the result of the test that show the values are reliable. It means that if similar indicators are used for repeated measurements, the results remain unchanged and consistent. The indicators used in this study are indicators that are commonly used to represent the variables in several previous studies, strengthening the reliability test's results.

Table 3. The Results of Reliability Test

No.	Variable	Cronbach's Alpha	Description
1	Quality of service	0.892	Reliable
2	Customer Satisfaction	0.899	Reliable
3	Customer Loyalty	0.871	Reliable

4.2. Confirmatory Factor Analysis Test

After conducting a confirmatory factor analysis to assess the fit of each construct, the next step is to perform a confirmatory test for the entire model. The full structural model confirmatory test examined the relationship between the independent variable such as quality of service (*X*) and the dependent variables such as customer satisfaction (*Y1*) and customer loyalty (*Y2*).

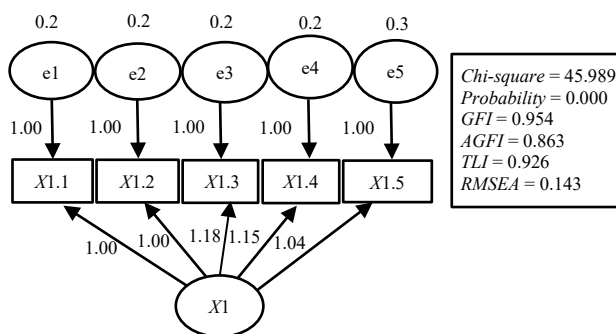


Figure 2. Confirmatory Factor Analysis Quality of service Construct

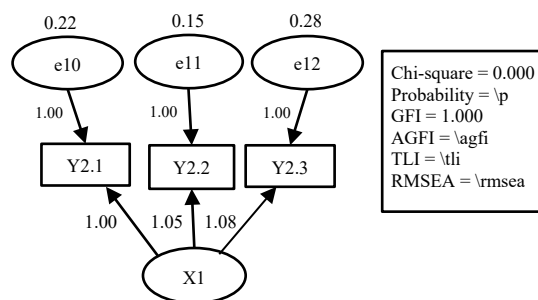


Figure 3. Confirmatory Factor Analysis of Customer Satisfaction Construct

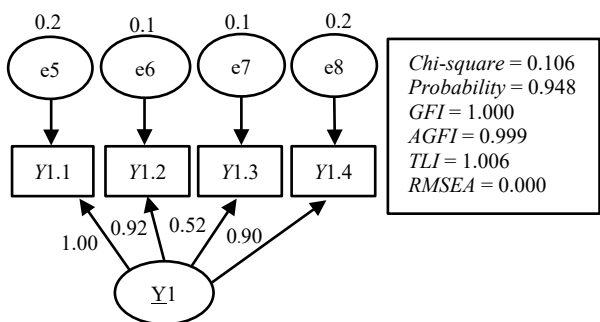


Figure 4. Confirmatory Factor Analysis of Customer Loyalty Constructs

The variable data processing results above show the confirmatory factor analysis test results for indicators on the customer loyalty variable. This customer loyalty variable has no probability level value due to the chi-square value = 0.106 AGFI = 0.999 TLI = 1.006 and RMSEA = 0. It can be seen from the estimated value to see whether this indicator is valid. Furthermore, the loading factor value is analyzed. The values for the indicators are above the value of 0.50, so all indicators can be included in the calculation and analysis. These results indicate that the data utilized in this study support the hypothesis in the measurement model in construct diagram. These results also support the theories from previous studies.

4.3. Confirmatory Factor Analysis Full Structural Model Test

Following the completion of confirmatory factor analysis to assess the fit of each construct, the subsequent essential step involves conducting a confirmatory test for the overall model. This comprehensive test incorporates a full structural model delineating the relationship between the independent variable of quality of service and the dependent variables of customer satisfaction and customer loyalty.

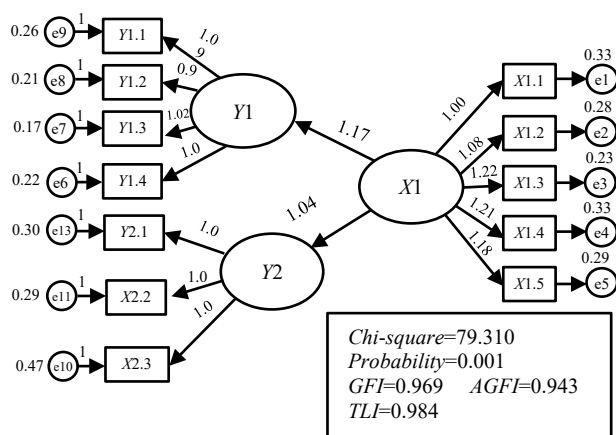


Figure 5. Confirmatory Factor Analysis Between Quality of service, Customer Satisfaction and Customer Loyalty

The data processing results above show that the model was fit because it met the criteria for the goodness-of-fit test. The results of the goodness of fit test indicate that the sample data adheres to the theoretical distribution in the study. Additionally, the goodness of fit test reinforces the

findings of the confirmatory analysis test. Moreover, the loading factor value shows that all indicators in this model are suitable for testing and analysis. The following model describes the results of the modified confirmatory factor analysis full model between the independent variable or quality of service variable on the dependent variable or the variable customer satisfaction and customer loyalty.

Figure 4 shows that Y1.1 (Rate High for Customer satisfaction score) from customer satisfaction variable and Y2.1 (Intention to reorder the services) of customer loyalty variable were the indicators that had the highest point as representative of those variables. It means that Indicator Y2.1 (Intention to reorder the services) has the significant correlation to the customer loyalty. When the quality of services meets customer expectations, customers are more likely to make repeat orders as a form of loyalty to the product. Likewise, Indicator Y1.1 (high customer satisfaction score) has the highest loading factor value among the indicators in the customer satisfaction variable. When customers are satisfied with a service product, they tend to give high scores to the service assessment feature in the application. This feature is part of the efforts of online transportation businesses to evaluate the quality of their services and determine if they have met the criteria desired by consumers.

Table 4. Structural Model Goodness of Fit Index Results

Goodness of Fit Index	Cut off	Value of research	Description
Chi-square	67.459	79.310	Good Fit
Probability	≥ 0.05	0.001	Good Fit
RMSEA	≤ 0.08	0.046	Good Fit
GFI	≥ 0.9	0.969	Good Fit
AGFI	≥ 0.9	0.943	Good Fit
TLI	≥ 0.9	0.984	Good Fit
CFI	≥ 0.9	0.990	Good Fit

Based on the Goodness of Fit Index table above, after interpretation, it can be concluded that the model is close to fit. The values shown are chi-square (79.310), probability (0.001), RMSEA (0.046), GFI (0.969), AGFI (0.943), TLI (0.984), and CFI (0.990).

4.4. Hypothesis Test

After the model is obtained, the authors will summarize the results of the influence of the variables studied in Table 4.

Table 4. Parameter Estimation of Full Model Analysis

Variable	Estimate	C.R.	P
Quality of service → Customer Satisfaction (H1)	1.266	14.380	***
Quality of service → Customer Loyalty (H2)	1.043	11.080	***

According to the results of comprehensive analysis obtained in Table 4, it is clear that all the values of the t table > t-table with DF 40 at the 5% significance level with a critical value of 2,423. This thorough analysis supports the acceptance and proof of hypothesis H1 developed in this study by hypothesis testing. Similarly, the analysis results show that all the values of the t-count table > t-table with DF 40 at a significance level of 5% with a critical

value of 2.423. This comprehensive analysis further supports the acceptance and proof of the H2 hypothesis developed in this study by conducting hypothesis testing. This study's thorough analysis proves that H1 is accepted because quality of service significantly influences the satisfaction of customer, and H2 is accepted because quality of service affects customer loyalty. In Table 4, upon comparing the estimated values of Hypothesis 1 and Hypothesis 2, it becomes apparent that the estimated value derived from Hypothesis 1 holds more significance than that of Hypothesis 2. This implies that service quality exerts a more substantial influence on customer satisfaction in comparison to customer loyalty.

Table 5. Regression Weight Results Structural Model Regression Weights: (Group Number 1 - Default Model) with a *Sig.* < *A* = 5% value

	Estimate	S.E.	C.R.	PLabel
$Y1 \leftarrow X1$	1.266	0.088	14.380	***par 10
$Y2 \leftarrow X1$	1.043	0.094	11.080	***par 11

To increase customer satisfaction, the service must refer to the customer's desires. Establishing a good relationship with customers also helps achieve customer satisfaction and loyalty [20]. The results of testing the hypotheses proposed in the study:

1. The findings from Hypothesis 1 indicate that quality of service has a positive and significant impact on satisfaction of customer, thereby leading to the acceptance of H1. This suggests that higher quality of service increases customer satisfaction among users of Maxim's transportation services. The customers express their feeling about the services of online transportation by giving a high score in its application. This way is one of the best one to maintain and control the quality of service provided by the couriers and the business. Quality control is crucial in both manufacturing and service industries. Quality of service plays a crucial role in fostering long-term mutually beneficial relationships with customers. This emotional connection enables Maxim's transportation service company to better comprehend customer concerns and expectations, subsequently driving improvements in quality of service to enhance customer satisfaction with Maxim's transportation services. One effective method of assessing the quality of our service is by implementing a pull system that focuses on customer satisfaction and identifying customer needs [21]. So, the results of this study are in line with the theories of previous studies.

2. The influence of quality of service on customer loyalty the research findings for Hypothesis 2 indicate that quality of service has a positive and significant impact on loyalty of customer, confirming the acceptance of H2. This suggests that higher quality of service can enhance customer loyalty towards Maxim online transportation services. Customers who receive quality services are more likely to appreciate the value of the services provided. They will tend to make reorder services in the future. Evenmore they will tend to purchase the additional services [21]. In exchange for receiving high-quality service, they display loyalty by consistently selecting the business as their primary option for online transportation services.

3. Quality of service is influenced by two main factors: expected and perceived services. When the service received or perceived matches the expected service, it is considered good and satisfactory [21]. If the received or perceived service exceeds customer expectations, then the quality of service is seen as excellent. Conversely, if the received or perceived service falls below customer expectations, the quality of service is considered poor. Therefore, the level of quality of service is determined by the service provider's ability to consistently meet customer expectations. The use of information technology supported by big data analytics is an opportunity and a challenge for online transportation companies to meet consumer demand and expectations [22]. Especially related to trust and security [23, 24]. It is actually a challenge for companies to maintain consumer trust by establishing good communication with them [25].

In this study, Structural Equation Modeling (SEMS) is used to analyze the impact of service quality on customer satisfaction and loyalty. The findings indicate that service quality significantly and positively affects both variables. However, in comparison to value, service quality has a greater influence on customer satisfaction than on customer loyalty. One limitation of the SEMS method is its inability to determine why the value of service quality has a less significant impact on customer loyalty than on customer satisfaction. Therefore, further analysis using different methods and additional attributes is necessary. The Serval and IPA methods support this study by integrating multiple dimensions of service quality identified in Serval with customers' prioritized preferences [7]. This integration can provide insight into aligning service quality with customer expectations.

5. CONCLUSION

Based on data collection, processing, and analysis, this study concludes that quality of service has a positive and significant effect on customer satisfaction. The analysis results align with the hypothesis, showing that quality of service positively and significantly impacts customer satisfaction. These results suggest that high quality of service can lead to customer satisfaction through indicators such as 1) rate high score for service quality, 2) Desire to promote the services, and 3) No complaining from customers. The customers tend to rate high score when they satisfy to services. They also delight to promote the services to others. It can be an alternative way to evaluate service quality.

Additionally, the analysis indicates that quality of service positively and significantly influences customer loyalty, supporting the hypothesis. Good quality of service can foster customer loyalty. The provision of high-quality service has a direct impact on customer loyalty, ultimately resulting in increased sales. Customer loyalty manifests through repeat purchases, thereby driving sales. The findings highlight the importance of good quality of service and prompt handling of customer needs in attracting and retaining loyal customers when choosing and using online transportation services. Companies of online transportation must always carry out continuous

quality improvement, considering its vital influence on consumer satisfaction and customer loyalty, which leads to sales performance. Further research is suggested to formulate appropriate strategies to improve service quality, which is oriented towards customer satisfaction and loyalty. This research can also be continued by examining service quality, consumer trust levels, data security, and consumer satisfaction issues.

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