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Analysis Of Service Quality On Satisfaction Customers On Telkomsel Cards With Confirmatory Factor Analysis Method

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ABSTRACT
PT. Cellular Telecommunications or in short Telkomsel is a subsidiary of Telkom Indonesia which operates in the telecommunications sector for individual consumers (until 2023 it only deals in cellular telecommunications). The more mobile companies develop, the tighter the competition between companies becomes, so there is a need for an analysis that discusses the factors that have the most influence on the company's development, one of which is by looking at customer satisfaction factors. The progress of a company is influenced by the company's ability to serve its customers. In terms of services offered by the company, it is necessary to pay attention that the quality standards offered to customers must exceed customer expectations, so that customer satisfaction can be easily achieved by the Company. In statistics, there are several factor analysis methods, including Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) . The confirmatory method is a multifarious method that can be used to test or confirm a hypothesized model. This method is a measurement method in multivariate equation modeling. This model is more flexible compared to the general classical approach. From the results of research conducted using two-stage confirmatory factor analysis, several conclusions can be put forward that the indicators that influence service quality on customer satisfaction on Telkomsel cards using the Confirmatory Factor Analysis (CFA) method are the total contribution made by service quality to customer satisfaction at PT Telkomsel is equal to 0.824. This shows that the service quality dimension which measures the customer satisfaction variable can explain this influence by 82.4%.

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INTRODUCTION

Communication is a universal need for every human being, so that humans can get to know each other more closely and information can be spread faster. With the development of technology, communication has become more effective and efficient. This is indicated by the presence of communication tools that are widely used by the community, from the lower, middle to upper classes. The increasing need for technology in society is one of the reasons for the birth of cellular telephone companies.

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In Indonesia, there are several cellular companies that are developing, namely Telkomsel, Indosat, Excelcomindo, Mobile-8, Telkom, Bakrie Telcom, Natrindo, Lippo Telcom. The total number of cellular phone subscribers currently reaches 51 million consumers, 51% or around 25,786,000 of whom are customers/consumers of PT. Telkomsel which is the market leader of cellular operators in Indonesia, in second place is PT Indosat with 27.2% or around 13,800,000 customers, in third place is PT. Excelcomindo with 14% or around 7,091,912 customers, and in fourth place is PT. Telkom with 4.4% or around 2,252,248 customers, in fifth place is PT. Mobile-8 with 2.4% or around 1,215,787 customers, in sixth place is PT. Bakrie Telecom with 0.05% or around 666,651 customers.

PT. Cellular Telecommunications or abbreviated as Telkomsel is a subsidiary of Telkom Indonesia which operates in the telecommunications sector for individual consumers (until 2023 it only handles cellular telecommunications). Telkomsel is the largest cellular telecommunications operator in Indonesia. To support its business, the company has 397 GraPARI outlets throughout Indonesia by the end of 2021. Since then, all Telkomsel customer service centers have been designated as GraPARI Telkomsel.

(Kotler 2002) stated that satisfaction is a feeling of pleasure or disappointment that arises after comparing the perception / impression of the performance (or results) of a product and its expectations. (Engel et al 1990) in (Tjiptono 2000) stated that customer satisfaction is a post-purchase evaluation where the chosen alternative is at least the same or exceeds expectations, while dissatisfaction arises when the results do not meet expectations. Satisfaction / dissatisfaction occurs when customers evaluate their expectations with the performance / results they receive. Several experts and previous research results state that the determining factors of customer satisfaction are service quality and pricing.

The more the cellular company develops, the tighter the competition between companies, so it is necessary to have an analysis that discusses the factors that have the most influence on the development of the company, one of which is by looking at the customer satisfaction factor. The progress of a company is influenced by the company's ability to serve its consumers. In terms of the services offered by the company, it should be noted that the quality standards offered to customers must exceed customer expectations, so that customer satisfaction can be easily achieved by the company.

There have been many studies in the service industry that test the relationship between service quality and company image through customer satisfaction. (Selnes 1993) conducted a test on the effect of product or service performance quality on brand reputation, customer satisfaction and loyalty in the service industry sector such as life insurance, telephone companies, universities or the tangible product industry sector, namely salmon food suppliers. The increasingly tight situation between companies or institutions providing these products also makes it difficult for companies to increase their number of customers. There are many products in various markets with various advantages and added value offered by competitors. Therefore, a better alternative is to make various efforts to maintain the existing market by trying to provide satisfaction to consumers.

In statistics, there are several factor analysis methods including Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The confirmatory method is one of

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the multivariate methods that can be used to test or confirm a hypothesized model. This method is a measurement method in multivariate equation modeling. This model is more flexible than the general classical approach. Therefore, this study will conduct customer satisfaction research with the aim of improving the quality of Telomsel's service performance using the Confirmatory Factor Analysis method.

METHODS

Research Type and Data Source

This research uses quantitative research. The type of data used in this study is primary data. Primary data is data or information collected directly from the object of field research or direct observation. This primary data was taken through a questionnaire given to students of the Faculty of Science and Technology, State Islamic University of North Sumatra, Medan. The measuring instrument used is the Likert scale. The steps to create a Likert scale are as follows:

a. Collect a number of questions that are in accordance with the attitude to be measured and can be clearly identified (positive or not positive).
b. Give the statements above to a group of respondents to be filled in correctly.
c. The response to each statement is calculated by adding up the numbers from each statement in such a way that the responses that are in the same position will consistently receive the same numerical value.
d. Look for statements that cannot be used in the study, if there are: statements that are not filled in completely by respondents and statements that in total the respondents do not show a substantial correlation with the total value.

The final filtered statements will form a Likert scale that can be used to measure the attitude scale. Information obtained with the Likert scale is an ordinal measurement scale, as the results obtained can only be ranked without knowing how much difference there is between one response and another. The Likert scale relates to statements about a person's attitudes, opinions, and perceptions of something, for example, agree-disagree, happy-unhappy, good, bad, and others. The following is Table 1 about the research weight (with a certain weight for each question):

Table 1. Research Value

Score Value	Respondents' Answers
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Research Variables

The variables and operational definitions of variables in this study are one variable, namely the endogenous variable, namely service performance (employees) and 1 exogenous variable, namely the customer satisfaction variable.

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Data Analysis Technique

This technique is also an important stage to be used as research material. And this study uses primary data. There are 2 techniques in data analysis, namely:

Convenience Sampling Technique

Because no students of the Faculty of Science and Technology were detected using Telkomsel cards, the technique used in this study is the sampling technique with Convenience Sampling. The Convenience Sampling technique is a method of taking samples that is taken spontaneously, meaning that anyone who accidentally meets the researcher and is in accordance with their characteristics, then that person can be used as a sample. In other words, the sample was selected because it was in the right place and time. Without criteria, researchers are free to choose anyone they meet to be used as a sample.

Thus, this sampling technique is used when researchers are faced with conditions where the characteristics of population elements cannot be clearly identified, so the convenience sampling technique, or often also called accidental sampling, is one of the options. Convenience sampling technique is a sampling technique that is carried out for reasons of convenience or practicality according to the researcher himself. The basis for consideration is that data can be collected quickly and cheaply, and provides sufficient evidence. The main weakness of this sampling technique is clear, namely the very low generalization ability or the reliability of the data obtained is questionable.

Pilot Survey

After compiling the questionnaire, a pilot survey was conducted as an initial test to determine whether the questionnaire was appropriate and could be understood well by respondents when reading it, or an evaluation was needed to improve the contents of the questionnaire before the actual data collection was carried out. As for testing the sincerity of the respondents' answers, an evaluation of validity and reliability was carried out using the SPSS 16 trial version software.

For the validity test, Person correlation is usually used. By calculating the correlation coefficient between each value in the question number with the total value of the question number. Furthermore, the correlation coefficient obtained r still has to be tested for significance using the t-test or comparing it with the r table. If t count> r table, then the question number is valid. While for the reliability test that is considered satisfactory is r count> 0.70.

RESULTS AND DISCUSSION

Sampling Technique and Sample Size of the Study

The sampling method used in this study is the Convenience Sampling technique. Since no students of the Faculty of Science and Technology were detected using Telkomsel cards, the technique used in this study was the Convenience Sampling technique. The Convenience Sampling technique is a method of taking samples that is taken spontaneously, meaning that anyone who accidentally meets the researcher and is in accordance with their characteristics

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can be used as a sample. In other words, the sample was selected because it was in the right place and time. Without criteria, researchers are free to choose anyone they meet to be used as a sample. Based on the technique used, 35 students were obtained who were willing to be samples in this study.

Operationalization of Variables

There are two types of variables used in this study, namely observation variables and latent variables. Observation variables are variables that can be measured directly or observable, while latent variables are variables that cannot be observed or unobservable, arranged and measured indirectly through their indicators (observation variables). Latent variables in this study are classified into two types, namely exogenous latent variables and endogenous latent variables.

Building a Theory-Based Model

Based on the information obtained and the theoretical studies conducted, in this study there are two dimensions, namely: service quality and customer quality.

Table 2. Operation Variable

Variabele	Indicator	No. Item
Kualitas pelayanan (δ)	Accuracy of information provided	1
	Customer Service Attitude	2
	Response to Customer Complaints	3
	Timeliness of Service	4
	Friendliness, attention, politeness of employees	5
	Ease and speed of service	6
Kepuasan konsumen (η_1)	Repeat visits	7
	Inviting and influencing others to use Telkomsel	8
	Satisfaction with products and services	9
	Continue to use Telkomsel products and have no intention of using other cards	10

Converting Path Diagrams into Equations

Structural equations are formulated to express the causal relationship between exogenous latent variables and endogenous latent variables. The structural equations obtained are as follows:

$$\eta_{mx1} = \Gamma_{mxn}\delta_{nx1} + \delta_{mx1}$$

$$\eta_1 = \gamma_{11}\delta + \delta_1$$

In matrix:

$$[\eta_1]=[\gamma_{11}][\delta] + [\delta_1]$$

And the measurement equation is as follows:

$$y = \Delta_y \eta + \varepsilon$$

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$y_1 = \alpha^y + \varepsilon_1$
$y = \alpha^{y11} + \varepsilon$
$2 \quad 21$
$y = \alpha^y + \varepsilon$
3
$y = \alpha^y + \varepsilon$
$y_5 = \alpha^{y4} + \varepsilon_5$
$y_6 = \alpha^{y5} + \varepsilon_6$
$y_7 = \alpha^y + \varepsilon_7$
$y_8 = \alpha^y + \varepsilon$

$y_9 = \alpha^y + \varepsilon$

$y_{10} = \alpha^y + \varepsilon$

Conformatory Factor Analysis

Validity and Reliability Test Results

Survey Plot Validity and reliability evaluation was conducted to test the sincerity of respondents' answers. The results of the validity and reliability tests can be seen in table 2.

Table 2. Results of Validity and Reliability Tests of the Survey Pilot

C	Customer Satisfaction	Service Quality	Description
K1		0,774	Valid
K2		0,843	Valid
K3		0,71	Valid
K4		0,823	Valid
K5		0,761	Valid
K6		0,753	Valid
P1	0,946		Valid
P2	0,965		Valid
P3	0,976		Valid
P4	0,903		Valid
	0,882	0,962	Reliabel

Based on the table, the results of the validity test show that for the service quality variable of the 6 question items, the r count value is greater than 0.3 so that all items are included in the data collection process. While for the consumer satisfaction variable, the four question items have an r count value greater than 0.3, so that all items in the Motivation Factor variable are valid and included in the data collection process. For reliability testing, service quality and consumer satisfaction have a cronbach's alpha value greater than 0.7, so that both constructs are reliable and worthy of use in the data collection process.

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Model Identification Results

In this study, there are 2 indicator variables. The number of data known in this analysis is as follows:

Parameter Estimation Results and Path Diagram

Path diagram in two-stage confirmatory factor analysis along with estimated result parameters that describe the relationship between indicators and service quality and customer satisfaction.

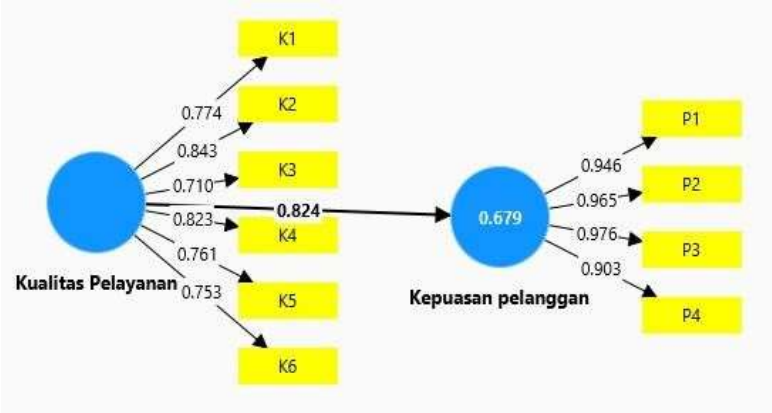

Image 1. Path Diagram of Parameter Estimation Results

Measurement Model Evaluation

The measurement model evaluation is conducted to see whether the observation variables have accurately measured their constructs. The evaluation is conducted by testing the validity and reliability. Validity testing is conducted by looking at the loading factor value and the calculated t-statistic value. Validity testing in evaluating the measurement model is listed in Table 3.

Table 3. Measurement Model Validity Testing

	Outer loadings
K1 <- Service Quality	0,774
K2 <- Service Quality	0,843
K3 <- Service Quality	0,71
K4 <- Service Quality	0,823
K5 <- Service Quality	0,761
K6 <- Service Quality	0,753
P1 <- Customer Satisfaction	0,946
P2 <- Customer Satisfaction	0,965
P3 <- Customer Satisfaction	0,976
P4 <- Customer Satisfaction	0,903

This table shows that all standardized loading factors in the measurement model have good validity. This is based on the criteria where the standardized loading factor value is ≥

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0.50. So it can be concluded that the observation variables in the CFA measurement model can measure their constructs (service quality and customer satisfaction) quite well.

Next, a reliability test is carried out to see the consistency of the measurement of the observation variables together against each of their constructs. The following shows the Construct Reliability (CR) and Variance Extracted (VE) values for each construct in the CFA model.

Table 4. Reliability Testing of Measurement Models

	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Customer Satisfaction	0,968	0,973	0,899
Service Quality	0,915	0,902	0,606

From Table 4. above, it is known that all Construct Reliability values of both variables exceed the threshold of 0.70 and the Variance Extracted value exceeds the threshold of 0.50. This indicates that the level of reliability in each construct is quite high, so it can be said that the indicators in each construct are consistent enough to measure the construct.

Overall or Structural Model Evaluation

After evaluating the measurement model, the next step is to evaluate the structural model of the proposed model where there is 1 dimension, namely service quality that can have an impact on customer satisfaction at PT Telkomsel. The following shows the results of the evaluation of the suitability of the overall model inferentially and descriptively:

Tabel 5. Nilai Kesesuaian Model Keseluruhan

	Saturated model	Estimated model
SRMR	0,184	0,184
d_ULS	1,861	1,861
d_G	3,065	3,065
Chi-square	285,569	285,569
NFI	0,51	0,51

Table 5 above is the statistical value of the calculation for testing the suitability of the structural model. For inferential statistical testing, the chi-square value is 285.569. Furthermore, the SRMR value shows a value of 0.184, and the NFI value is 0.51. Thus, it can be concluded that the overall suitability of the model is good.

Analysis of Service Quality Measurement Model

The measurement model (first order CFA) is defined as a measurement model between the endogenous latent variables of service quality and each of its indicators. The results of the

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standardized loading factor parameter estimation (weight value) for the service quality measurement model from 6 indicators can be seen in table 4.4 above. If accumulated, the total contribution given by the 6 indicators in measuring the service quality dimension is the Average Variance Extracted value. From the previous calculation for the service quality dimension, the Average Variance Extracted value was obtained as 0.899. This shows that the 6 indicators that measure the service quality dimension can explain the dimension by 89.9%.

Customer Satisfaction Model Analysis

The CFA measurement model is defined as a measurement model between the exogenous latent variables of customer satisfaction and each of its indicators. The results of the standardized loading factor parameter estimation (weight value) for the customer satisfaction measurement model from 4 indicators can be seen in table 4.4 above. If accumulated, the total contribution given by the 4 indicators in measuring the customer satisfaction dimension is the Average Variance Extracted value. From the previous calculation for the service quality dimension, the Average Variance Extracted value was obtained as 0.606. This shows that the 6 indicators that measure the service quality dimension can explain the dimension by 60.6%.

Analysis of Service Quality Model on Customer Satisfaction

The measurement model can be interpreted as the relationship between latent variables, namely service quality and customer satisfaction. The following shows the results of the parameter relationship estimation using CFA:

Table 8. Correlation Value of Dimensions on Customer Satisfaction Variables

Variabel	Dimension	Path Coefficient	Correlation
Customer satisfaction	Quality of Service	$\gamma 11$	0,824

In Table 8, information can be obtained related to the correlation given by the dimensions to the variables, it can be seen that the dimension, namely service quality, has a correlation value of 0.824. If accumulated, the total contribution given by service quality to customer satisfaction at PT Telkomsel is 0.824. This shows that the service quality dimension that measures the customer satisfaction variable can explain the influence by 82.4%.

CONCLUSION

From the results of the study conducted using two-stage confirmatory factor analysis, several conclusions can be put forward that the indicators that influence service quality on customer satisfaction on Telkomsel cards using the Confirmatory Factor Analysis (CFA) method obtained a total contribution given by service quality to customer satisfaction at PT Telkomsel, which is 0.824. This shows that the service quality dimension that measures customer satisfaction variables can explain the influence by 82.4%.

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