



QUALITY CONTROL OF ELEVATOR AND ESCALATOR MAINTENANCE SERVICES AT PT ABC SURABAYA

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Abstract: This study aims to analyze the relationship between service quality, product quality and trust in the decision to use brand image as an intervening medium inservice providers *elevator* and *escalator*. This type of research is an *explanatory research type* using quantitative descriptive research methods. The sample used was 70 respondents. The data was processed using themethod *Structural Equation Model-Partial Least Square*. The results showed that: (1) service quality and product quality had a positive and significant effect on brand image; (2) service quality, brand image and trust have a positive and significant effect on usage decisions; (3) there is a positive and significant influence between service quality and product quality on the decision to use brand image as a mediating variable.

Keywords: Service Quality, Product Quality, Trust, Brand Image, Usage Decision

INTRODUCTION

In planning to build infrastructure, high-rise buildings and high-rise housing are now synonymous with the presence of an elevator or escalator which is used as a vertical transportation tool to move people or goods from one level to another. The use of technology that follows the development of modern times has become an elevator reliability to further facilitate human work effectively and efficiently. This is based on Law Number 28 of 2002 Article 29, it has been stated that the ease of building vertical connections, including vertical transportation facilities, can be in the form of providing stairs, ramps, and lifts.

To meet the needs of high-rise buildings or other facilities for the use of this vertical mode of transportation, it is inseparable from the initial step in selecting a reputable company engaged in the procurement, installation and maintenance of elevators, escalators, travolators and moving walks. Includes schedule procurement and installationin accordance with the time plan for the construction of the building.

This activity will increase competitiveness in the procurement of new lift units. Procurement and new installation are customer expectations of the design, specifications and materials that are mutually agreed upon during the buying and selling process. Currently, there are more than 50 national and multi-national companies engaged in elevators and escalators as

sole distributors and maintenance services.

Table 1. The results of PT ABC achievement on the service quality dimension

Source: data from the company PT ABC

Dimensions of the		Achievement	Company's Standard
Product Quality	Features of <i>saving energy</i> and <i>minimum space</i> can be an attraction for consumers	0.753	0.80

Table 1 shows that the results of the achievement of PT ABC based on consumer assessments on the dimensions of service quality on the use *tools* of *modern*, *safety* and the latest technology are still below the standards set by the company with a difference of 0.027.

Table 2. The results of PT ABC achievement on the product quality dimension

Source: PT ABC company data

Dimensions of the		Achievement	Company's Standard
Brand Image	Considering the product because of <i>safety</i> and the latest technology	0.894	0.93

Table 2 shows that the results of the achievement of PT ABC based on consumer assessments on the dimensions of product quality on the *energy saving* and *minimum space features* can be an attraction for current consumers, which are still below the standard set by the company with a difference of 0.047.

Table 3. PT ABC achievement results on the brand image dimension

Source: PT ABC company data

Dimensions of the		Achievement	Company's Standard
Trust	Recommend manufacturers to other people / companies / agencies.	0.918	0.93

Table 3 shows that the results of the achievement of PT ABC are based on consumer assessments of the brand image dimension in considering the product because *safety* and the latest technology are still below the standards set by the company with a difference of 0.036.

Table 4. The results of PT ABC achievement on the dimension of trust.

Source: PT ABC company data

Table 4 shows that the results of the achievement of PT ABC based on consumer ratings

Dimensions of the		Achievement	Company's Standard
Decision to Use	Will reuse products from the same manufacturer	0.866	0.90

on the dimension of trust in recommending producers to other people / companies / agencies are still below the standard set by the company with a difference of 0.012.

Period	Percentage <i>Maintenance</i>	<i>Call Back Rate</i>
September 2020 - April 2021	80% - 100% (Fluctuative)	5% - 7%

Table 5 The results of PT ABC's achievement on the dimensions of the decision to use

Source: PT ABC company data

Table 5 shows that the results of the achievement of PT ABC based on consumer assessments on the dimensions of the decision to use the Will to reuse products from the same manufacturer are still below the standard set by the company with a difference of 0.034.

Table 6. Percentage of Number of Maintenance Units PT ABC Year 2020 - 2021

Source: PT ABC company data

Dimensions of the		Achievement	Company's Standard
Service Quality	Use <i>tools</i> of modern, <i>safety</i> and the latest technology	0,793	0,82

Based on table 6 that the percentage of maintenance conducted by PT ABC for the period of September 2020 - April 2021, it fluctuated with a magnitude of 80% - 100%, meaning that the number of maintenance and maintenance units for elevators and escalators was not constant every month. While the *call-back rate* reaches 5% - 7% with the *standard* used is 2%. This shows that the company still has problems with service quality, product, trust, brand image on consumer decisions in using maintenance service companies *elevator* and escalator.

Based on these problems, the researchers felt the need to conduct a study to analyze the factors that influence consumers in choosing elevator and escalator maintenance service providers in service providers with the absence of customer assessment results that do not meet *standards* company with the title "Quality Control of Elevator Maintenance Services. and Escalator at PT ABC in Surabaya.

Problem Identification

Based on the description of the discussion in the background, there are several problems faced, namely:

1. The results of achieving the *maintenance routine* are company's still fluctuating.
2. There are still customer complaints about product quality (*call back rate report*) which is volatile.
3. There is still a difference from the results of the achievement of PT ABC to consumer ratings in terms of service quality.
4. There is still a difference from the results of the achievement of PT ABC to consumer ratings in terms of product quality.
5. There is still a difference from the results of the achievement of PT ABC to consumer ratings in terms of brand image.
6. There is still a difference from the results of the achievement of PT ABC to consumer ratings in terms of trust.
7. There is still a difference from the results of the achievement of PT ABC to consumer ratings in terms of usage decisions.

LITERATURE REVIEW

Operational Management

Nigel Slack, *et al* (2013) explains that Operations Management is a form of company activity in managing its resources in making and providing services from the products produced. Heizer and Render (2005) explain that the focus of operations management is divided into three, namely *cost focus*, *quality focus* and *customization focus*.

Total Quality Management

According to Nigel Slack, *et al* (2013) defines that Total Quality Management (TQM) is a philosophy carried out by an organization to improve quality by placing quality as the core in the activities of an operation. Total Quality Management is an effective system to improve quality by integrating quality development and quality maintenance so that production and services can meet customer expectations and satisfaction.

Quality Control

According to Sofyan Assauri (in Hayu Kartika, 2013) control and supervision are activities carried out to ensure that production and operating activities are carried out in accordance with what was planned and if deviations occur, these deviations can be corrected so that what is expected can be achieved.

Service Quality

Parasuraman *et.al* (2013:44): "*Service quality is the customer perception's of the superiority of the service*". It means that service quality is perception customers to the benefits of a service. Kotler and Armstrong (2014; 681) stated "*Quality is the totally and characteristics of the product and service that bears on its ability to satisfy stated or implied needs*". features and characteristics of the product or service that support its ability to satisfy needs directly or indirectly live.

Product Quality

According to Kotler and Armstrong (2014: 259), a product is anything that can be offered to the market to attract attention, acquisition, use, or consumption that might satisfy customers.

Brand Image

According to Kotler and Armstrong (2012) *brand image* is a set of consumer beliefs about a particular brand. Kotler and Armstrong (2014; 681) stated "*Quality is the totally and characteristics of the product and service that bears on its ability to satisfy stated or implied needs*". features and characteristics of the product or service that support its ability to satisfy needs directly or indirectly live.

Trust

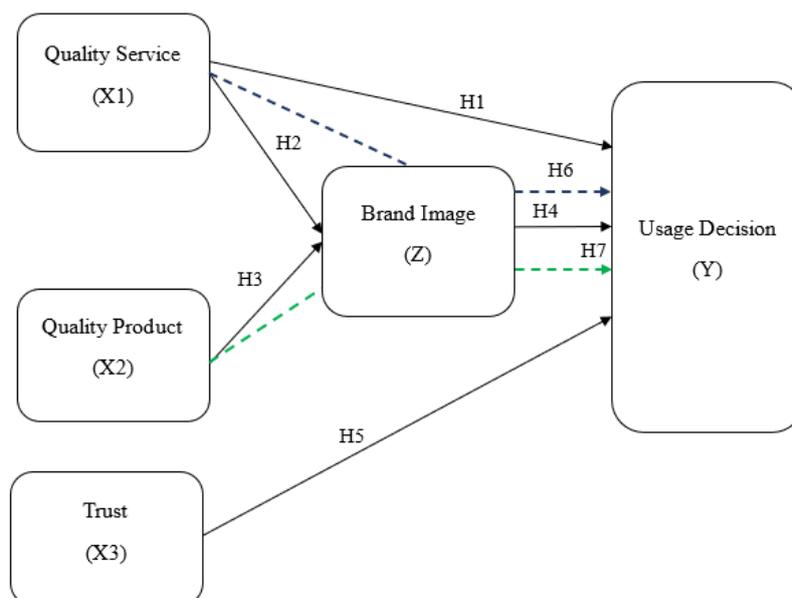
Trust is all knowledge possessed by consumers and all conclusions that consumers make about objects, attributes and benefits (Mowen and Minor, 2002).

Usage Decision

According to Peter and Olson Christiana (2008) decision making is an integration process that involves knowledge to evaluate two or more alternatives and choose one of them. The decision in a general sense is "*a decision is the selection of an option from two or more alternative choices*" which is a person's decision where he chooses one of several available alternative choices.

After sales

According to Kotler, Keller (2011: 237) "A company must determine how to offer after-sales services (eg, maintenance and repair and training services to customers)". Companies provide after-sales service usually as a form of responsibility given to the goods they have sold.



Source: PT ABC company data
 Figure 1. Framework Used

RESEARCH METHOD

Research Design The

type of approach that the researcher uses is a quantitative descriptive analysis approach with *explanatory research*. According to (Sani & Vivin, 2013; 180) *explanatory research* is to test hypotheses between hypothesized variables.

Variable Operational

Table 7. Variable Operational

Variable	Dimensions Variable
Service Quality (Independent Variables - X1)	<ol style="list-style-type: none"> 1. Tangibles 2. Reliability 3. Responsivity 4. Assurance 5. Empathy
Product Quality (Independent Variable – X2)	<ol style="list-style-type: none"> 1. Performances 2. Features 3. Conformance to Specification 4. Durability 5. Aesthetics
Trust (Mediation Variable – X3)	<ol style="list-style-type: none"> 1. Satisfaction Guarantee 2. Caution 3. Directness
Brand Image (Independent Variable – Z)	<ol style="list-style-type: none"> 1. Recognition 2. Reputation 3. Affinity
Usage Decision (Dependent Variable – Y)	<ol style="list-style-type: none"> 1. Selection of Service Products 2. Term 3. Job volume

Source: Primary data processed (2020)

Population and Sample

The population used is consumers who have an elevator and or escalator in the building as many as 85 consumers.

The sample used is based on the Slovin formula, as many as 70 respondents with the following criteria:

1. Consumers who own and use elevators and or escalators, both in buildings and housing with various brands in Jakarta.
2. Consumers who own elevators and or escalators with brands that have been or are still customers of PT ABC

Data Sources

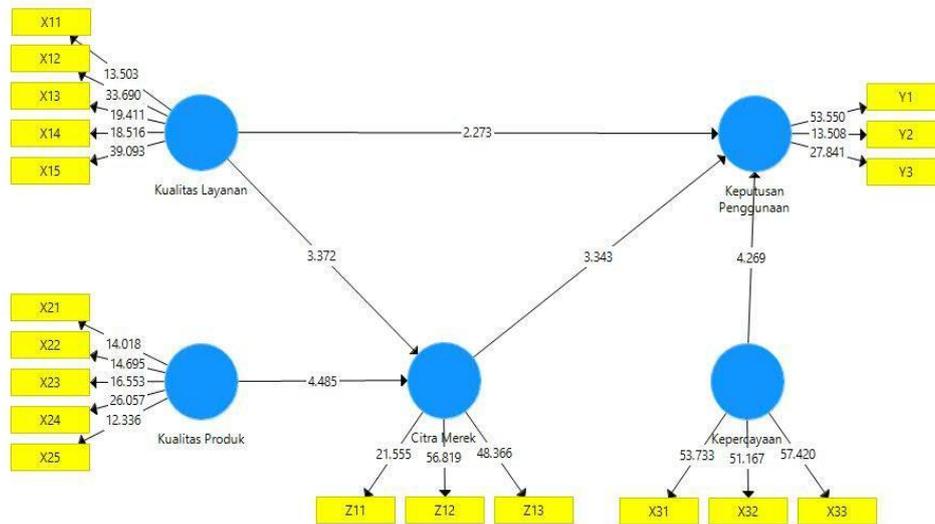
Using a questionnaire with google forms, interviews, library studies and company documentation.

Analysis Method

Using SEM (Structural Equation Model) using software SmartPLS Ver 3.3.3 .

FINDINGS AND DISCUSSION

Outer Model



Source: SmartPLS Data Processing Results
Figure 2. Outer Model Measurement

Validity test

According to Jogiyanto (2007), validity in research is explained as a degree of accuracy of research measuring instruments about the true meaning being measured.

Convergent Validity

To test convergent validity, the outer loading value or loading factor is used.

Table 8. Outer Loadings (Measurement Model)

Construct	Items	Outer Loading	Terms	Results
Service Quality	X11	0,797	>0,7	Valid
	X12	0,878		Valid
	X13	0,837		Valid
	X14	0,793		Valid
	X15	0,899		Valid
	X21	0,810		Valid
Product Quakity	X22	0,753		Valid
	X23	0,852		Valid
	X24	0,867		Valid
	X25	0,780		Valid

	X31	0,918	Valid
Trust	X32	0,931	Valid
	X33	0,926	Valid
	Z11	0,941	Valid
Brand Image	Z12	0,866	Valid
	Z13	0,912	Valid
	Y1	0,894	Valid
Usage Decision	Y2	0,943	Valid
	Y3	0,916	Valid

Source: Analysis Results using SmartPLS 3.3.3

Table 8 shows that the entire loading factor value of each indicator in the variables and dimensions is above 0.7.

Discriminant Validity

This test is based on the value of the cross loading measurement with the construct and the value of Average Variance Extracted (AVE).

Table 9. Fornell Larcker Critical Variable Research

	(Z)	(X3)	(Y1)	(X1)	(X2)
(Z)	0,918				
(X3)	0,822	0,925			
(Y1)	0,808	0,821	0,907		
(X1)	0,848	0,823	0,803	0,842	
(X2)	0,866	0,798	0,801	0,848	0,814

Source: The results of the analysis using SmartPLS 3.3.3

Based on table 9 above, it shows that each indicator in the research variable has the value *cross loading* largest on the variables it forms compared to the value *cross loading* on other variables.

Table 10. Nilai AVE (Average Variance Extracted) Research Model

Variabel	Nilai AVE
Quality Service	0,709
Quality Product	0,662
Brand Image	0,843
Trust	0,856
Decision Usage	0,822

Source: Analysis Results using SmartPLS 3.3.3

Based on table 10 above, it shows that the AVE value for all research variables and research dimensions is above 0.5, which means that the AVE value for testing *discriminant validity* has met the requirements for further testing.

Reliability Test

Test The reliability test is used to measure the consistency of the respondents' consistency in answering the question items in the questionnaire.

Composite Reliability

To test the value of the reliability of indicators on a variable.

Table 11. Composite Reliability

Variable	Composite Reliability	Standard	Results
Quality Service	0,924		Reliable
Quality Product	0,907		Reliable
Brand Image	0,941	>0,700	Reliable
Trust	0,947		Reliable
Decision Usage	0,933		Reliable

Source: Analysis Results using SmartPLS 3.3.3

Based on the data in table 11, it shows that the value *composite reliability* for all research variables is > 0.7 . So that the value of each variable has met *composite reliability*

Cronbach Alpha

Aims to strengthen the reliability test results.

Table 12.
Alpha

Variabel	Cronbach Alpha	Standard	Keterangan
Quality Service	0,897		Reliable
Quality Product	0,871		Reliable
Brand Image	0,906	> 0,700	Reliable
Trust	0,916		Reliable
Decision Usage	0,892		Reliable

Cronbach

Source: Analysis Results using SmartPLS 3.3.3

Based on the data in table 12, it shows that the value Cronbach Alpha for all research variables is > 0.7 (Ghozali and Latan, 2015). So that the value of each variable has met the value Cronbach Alpha and it can be concluded that all variables have a high level of internal consistency reliability.

Inner Model

Coefficient of Determination Test / R Square (R²)

Table 13. Nilai R-Square

Variable	R Square	R Square Adjusted
Brand Image	0,794	0,788
Decision Usage	0,743	0,731

Source: Analysis Results using SmartPLS 3.3.33

Based on table 13, it shows that the value *R-Square* of 79.4% in the Brand Image variable with a strong category is influenced by the service quality and product quality variables, while the remaining 20.6% is influenced by other variables outside of the research.

Goodness of Fit

Following the calculation of Q2 as follows (Hair et al., 2011).

$$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2)$$

$$Q^2 = 1 - (1 - 0,788)(1 - 0,731)$$

$$Q^2 = 1 - (0,212 \times 0,269) = 1 - 0,06 = 0,94$$

Hypothesis Results

Calculation of this hypothesis test using SmartPLS 3.3.3 can be seen from the Path Coefficient value, namely the t-statistic value of the relationship between variables in the study.

This hypothesis test can also be done by looking at the t-count and p-value.

In the statistical table, the value of t table with a value of $DF = n - k = 70 - 5 = 65$ is 1.997

with a significance level of 0.05. So the decision is

If P-Values > 0.05 or t-count < t-table, Ho is accepted and Ha is rejected.

If P-Values < 0.05 or t-count > t-table, Ho is rejected and Ha is accepted.

Table 14. Path Coefficient Results

Hubungan Antar Konstruk	Original Sample (O)	T Statistics (O/STDEV)	P Values	Hasil Hipotesa
Brand Image_ -> Decision Usage_	0,282	3,343	0,001	Accepted
Trust_ -> Decision Usage _	0,387	4,269	0,000	Accepted
Quality Service_ -> Brand Image_	0,399	3,372	0,001	Accepted
Quality Service_ -> Usage Decision _	0,246	2,273	0,023	Accepted
Quality Product_ -> Brand Image_	0,527	4,485	0,000	Accepted

Source: Analysis Results using SmartPLS 3.3.3

Relationship of Service Quality with Brand Image

According to the results path coefficient with a value of sample 0.399 which shows a positive number with a t-statistic value of 3.372 greater than 1.997 and a p-value of 0.001 less than 0.05. So that it can be said that the service quality variable has a positive and significant effect on the brand image variable. The results of this study are in accordance with previous research that service quality affects brand image (Levyda, 2015).

Relationship between Brand Image and Decision to Use

In accordance with the results of the path coefficient with a value of sample 0.282 which shows a positive number with a t-statistic value of 3.343 greater than 1.997 and a p-value of 0.001 less than 0.05. So that it can be said that the brand image variable has a positive and significant effect on the customer decision variable. The results of this study are in accordance with previous research that brand image affects the decision to use gas station fuel service providers (Ferdy, et al, 2015)

Product Quality Relationship with Brand Image

In accordance with the results of the path coefficient with a value of sample 0.527 which shows a positive number with a t-statistic value of 4.485 greater than 1.997 and a p-value of 0.000 less than 0.05. So it can be said that the product quality variable has a positive and significant effect on the brand image variable. The results of this study are in accordance with previous research that product quality has a positive and significant effect on brand image (Darmajaya, 2018).

Relationship of Trust with Decision to Use

In accordance with the results of the path coefficient with a value of sample 0.387 which shows a positive number with a t-statistic value of 4.269 greater than 1.997 and a p-value of 0.000 less than 0.05. So it can be said that the trust variable has a positive and significant effect on the use decision variable. The results of this study are in accordance with previous research that trust has a significant positive effect on decisions to use products smartphone (Putri and Sukaatmadja, 2018).

Relationship of Service Quality with Usage Decisions

In accordance with the results of the path coefficient with a value of sample 0.2467 which shows a positive number with a t-statistic value of 2.273 greater than 1.997 and a p-value of 0.023 less than 0.05. So that it can be said that the service quality variable has a positive and significant effect on the use decision variable. The results of this study are in accordance with previous research that trust has a significant positive effect on decisions to use products smartphone (Putri and Sukaatmadja, 2018).

Relationship of Service Quality on Usage Decisions with Brand Image as a mediating variable

There is a positive and significant influence between service quality on usage decisions and brand image as a mediating variable. This is in accordance with the results path coefficient with a value of sample 0.112 which shows a positive number with a t-statistic value of 2.511 greater than 1.997 and a p-value of 0.012 less than 0.05. It can be interpreted that brand image can be a mediation between service quality and the decision to use the service provider. The results of this study are in accordance with previous research that brand image mediates between service quality and usage decisions (Sandi and Rama, 2020).

Relationship of Product Quality on Usage Decisions with Brand Image as a mediating variable

There is a positive and significant influence between service quality on usage decisions and brand image as a mediating variable. This is in accordance with the results path coefficient with a value of sample 0.148 which shows a positive number with a t-statistic value of 2.447 greater than 1.997 and a p-value of 0.015 less than 0.05. It can be interpreted that brand image can mediate between product quality and the decision to use the service provider. The results of this study are in accordance with previous research that brand image mediates between product quality and usage decisions made by (Irwanty, et al , 2017).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In this section, conclusions will be presented on the hypotheses and discussion of research results in the previous chapter, so some conclusions can be drawn from this research as follows:

1. This study proves that service quality has a positive and significant effect on the brand image of service providers maintenance of elevators and escalators.
2. This study proves that product quality has a positive and significant effect on the brand image of companies providing elevator and escalator maintenance services.
3. This study proves that trust has a positive and significant effect on decisions to use companies providing elevator and escalator maintenance services.
4. This study proves that brand image has a positive and significant effect on the decision to use elevator and escalator maintenance service providers.
5. This study proves that service quality has a positive and significant effect on the decision to use elevator and escalator maintenance service providers.
6. This study proves that there is a positive and significant influence between service quality on usage decisions and brand image as a mediating variable.
7. This study proves that there is a positive and significant influence between product quality on usage decisions and brand image as a mediating variable.

Suggestions

That can be given based on the results of this study are as follows:

1. For further research, other variables can be used to test the effect on interest in reusing elevator and escalator maintenance services
2. The research was only conducted on consumers in Jakarta who use elevators as a transportation means *vertical* in their buildings. Therefore, further research can add the number of regions and respondents as the population and sample.
3. This research was conducted by taking samples of various brands of elevators and escalators. Therefore, further research can focus on one brand of elevator and escalator.
4. Companies must always pay attention to the *safety stock of spare parts* so that consumers can easily get them.
5. Companies must be quick to respond and be able to provide solutions to problems that occur in consumer lifts and escalators.
6. Companies must continue to maintain relationships with consumers through various available media. Companies must continue to improve equipment, materials and technology for the products they produce.
7. Companies must be able to guarantee or provide guarantees for products and work performed on consumer units.
8. Companies must continue to improve the ability of *features* in accordance with *standards* product to be able to compete with competitors and become an attraction for consumers.
9. Companies must improve the resilience of *spare parts* so they are not damaged quickly.
10. Companies must continue to innovate to create various types of interior lifts and escalators.
11. Companies must continue to improve safety and technology for the products issued.

12. Companies must be able to meet consumer expectations and satisfaction.
13. Companies must be honest and open to all information to consumers.
14. Companies must be able to provide satisfaction and fulfill all consumer desires so that the company is recommended by consumers to their colleagues.

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