(RESEARCH ARTICLE)

Product quality and price perception on customer loyalty mediated by customer satisfaction

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Abstract

This study aims to examine the effect of product quality and price perception on customer loyalty mediated by customer satisfaction. A sample of 96 respondents processed data using the Smart PLS 3 program. The results showed that: product quality had a direct and positive significant effect on customer loyalty and customer satisfaction. While price perception has no significant effect on customer loyalty, but price perception has a direct and negative significant effect on customer satisfaction, customer satisfaction has a direct and positive significant effect on customer loyalty, customer satisfaction can mediate the relationship between product quality and customer loyalty positively. Customer satisfaction can mediate the relationship between price perception and customer loyalty negatively. This research enriches information/theory regarding the relationship between product, price perception, customer satisfaction and customer loyalty and offers a new approach to the relationship between variables.

Keywords: Customer Loyalty; Customer Satisfaction; Price Perception; Product Quality

1. Introduction

The intensity of business competition has recently been increasing, this is evident from the number of new brands in the cooling fan industry that appear to be equipped with specifications and competitive prices in the market of each company. This step is deliberately taken by each company in order to be able to acquire new customers and retain existing customers. In conditions of increasingly fierce business competition, one of the things companies can do is to retain existing customers or promote high loyalty among customers. It can be understood that customers with high loyalty are expected to be able to support the growth and survival of the company. Loyal customers in general will tend to make purchases in the future, in addition, generally voluntarily also willing to persuade other people to buy products, and spread good information about products to others. All the actions of loyal customers can clearly contribute greatly to the survival of the company.

Given the essential function of customer loyalty in help the company's achievement and the company's survival, then research on customer loyalty is interesting to do. This research uses the cooling fan object of the brand 'K', because until now 'K' is one of the brands that is being sought in the industrial market, thus attracting researchers to scientifically examine what factors influence this loyalty.

Based totally on the background of the issues formerly described, seven research issues may be formulated as follows:

- Is customer loyalty influenced by product quality?
- Is customer satisfaction influenced by product quality?

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- Is customer loyalty influenced by price perception?
- Is customer satisfaction influenced by price perception?
- Is customer loyalty influenced by customer satisfaction?
- Is customer loyalty influenced by product quality through customer satisfaction?
- Is customer loyalty influenced by price perception through customer satisfaction?

Following a review of some of the available literature, customer intention to buy is a lot to do with customer perception on quality of product and satisfaction on product. Perceived as the gap between the perceptions and expectations of customers who have more expectations than they actually receive? If management wants to improve evaluation of customer satisfaction, it will be more valuable for influencing customer perceptions of product performance [1]. If provide quality service and reasonable price for customers, Customers are satisfied and ultimately loyal [2].

Product quality, quality of service and price can affect loyalty, either directly or through the satisfaction. Quality of service has the greatest impact on satisfaction and quality of product has the greatest impact on loyalty [3]. The functional value of products purchased by consumers is not optimal yet is the main consideration to satisfy consumers, precisely the quality of the product itself is in accordance with the production standards first [4].

Among the customer perceptions on quality of service, quality of product, the dominant factor affecting retail consumer attitudes is product quality recognition. This study also indicates that awareness of product quality impact to sales volume. The greater the perceived quality, the greater the sales volume generated from retail customers [5]. Product quality does not affect customer satisfaction, but consumer satisfaction impact to brand loyalty [6].

Customer loyalty is formed by relationship marketing through price fairness which is more dominant than the impact quality of service on loyalty through perceived price [7].

The direct impact quality of product on loyalty is less than the indirect impact quality of product on loyalty through consumer satisfaction. It turns out to be useful as a mediating variable between quality and consumer loyalty. The variables that give dominant effect on consumer loyalty are the overall product performance variables [8].

Price has a big impact on satisfaction of customer, quality of product has a fairly large and good effect on satisfaction of customer, price has a great and good effect on retention of customer, and this customer satisfaction has a good and high-quality effect on loyalty of customer [9].

Quality of product is an important factor affecting satisfaction of customer, and distribution channel loyalty is the level satisfaction of customer expectations and loyalty that is reflected in the product quality of manufactured and sold products. It is a complementary element that is not so important to measure. Price factors aren't the only reason to keep customers happy and loyal [10]. Quality of service has a positive impact on satisfaction of customer. Customer value affect satisfaction of customer. Brand image has a positive effect on satisfaction customer [11].

2. Methodology

Research methods are scientific techniques of acquiring records which can be used for a particular reason. A systematic path way that studies activities are based on scientific traits, that is rational, empirical, and systematic [12].

This is a quantitative research. Quantitative research is an empirical philosophy-based survey that surveys specific populations and samples, collects data using research tools, analyses quantitative / statistical data, and tests specific hypotheses. [12].

Population is an area of generalization composed of objects or subjects with specific characteristics, the characteristics that researchers have determined to study them and draw conclusions [12]. The population used by researchers is customers who use products from the company 'KFI'. The population in this study is not limited, because the population is not known with certainty (infinite population). Samples are part of population and characteristics [13].

In this study, researchers determined the number of samples using the Cochran formula as follows:

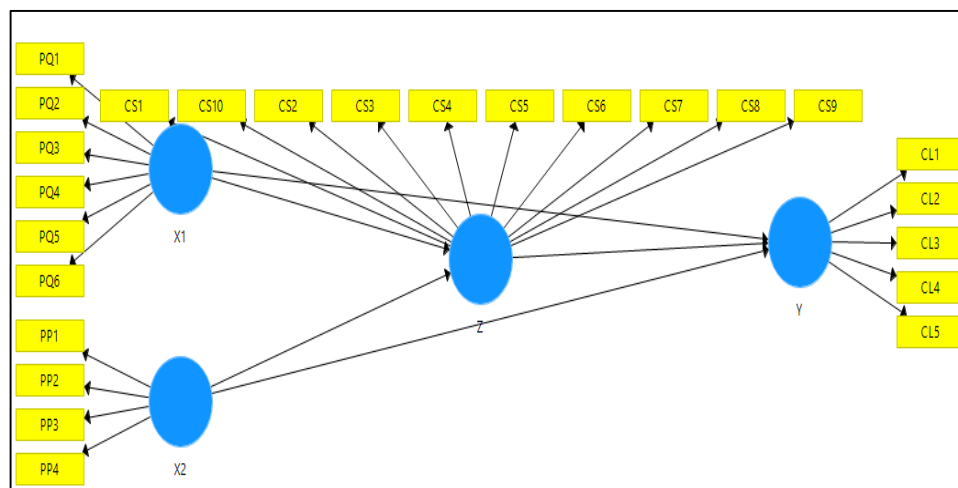$$n = \left(\frac{Z^2_{a/2}}{4d^2} \right)$$

Where:

n = Minimum sample size
Z = Area under normal curve
d = level of fault tolerance (sampling error)
p = Proportion expected
q = unexpected proportion
It is known:
a = 0.05 then Z0.05 = 1.96
d = 0.10
Answer: 96 Respondents

Based on the results of the above calculations, number of samples are 96 respondents. Likert scales are used to measure responses to surveys presented to respondents. To measure attitudes, opinions, and perceptions about social phenomena, the Likert scale is used. Likert scale converts the measured quantity into an indicator quantity. These indicators are then used as a starting point for creating instrumental elements that could be statements or questions. For the purposes of quantitative analysis, the answers were specifically scored as follows: "I am strongly agreeing" with a perfect score of 5. I agree with the score of 4. Doubt is rated on a 3-point scale. Disagreement is rated on a two-point scale. I strongly disagree score 1.

Related to the indicators used as the basis for data collection, as follows:

- Product Quality (X1): 1) Performance- 3 indicators; 2) Features- 1 indicator; 3) Conformance to Specifications- 1 indicator; 4) Aesthetic- 1 indicator [14].
- Price perception (X2): 1) Affordable price- 1 indicator. 2) Adjust the price to product quality- 1 indicator. 3) Price agreement with profit- 1 indicator. 4) Price is an indicator of capacity or price competitiveness- 1indicator [15].
- Customer Satisfaction (Z): 1) Perceived quality- 4 indicators; 2) Perceived value- 3 indicators; 3) Customer expectations- 3 indicators [16].
- Customer Loyalty (Y): 1) Repeat purchase- 1 indicator; 2) Great love for brands- 1 indicator; 3) Assignment on brands- 1 indicator; 4) The belief that a certain brand is the best brand- 1 indicator; 5) Brand recommendations of others- 1 indicator [17].

A description of all the variables raised in this study, a research model framework can be made as shown below:

Source: processed by Smart PLS3

Figure 1 Research Model Framework

2.1. Research Hypothesis Formulation

Hypotheses are prepared based on the theory and frame of mind that have been described previously, so from the theory and frame of mind several hypotheses as follows:

- H1: Product quality (X1) significantly affects to customer loyalty (Y).
- H2: Product quality (X1) significantly affects to customer satisfaction (Z).

- H3: Price perception (X2) significantly affects to customer loyalty (Y).
- H4: Price perception (X2) significantly affects to customer satisfaction (Z).
- H5: Customer satisfaction (Z) significantly affects to customer loyalty (Y).
- H6: Product quality (X1) significantly affects to customer loyalty (Y) through customer satisfaction (Z).
- H7: Price perception (X2) significantly affects to customer loyalty (Y) through customer satisfaction (Z)

3. Results and discussion

3.1. Evaluation of Measurement (Outer Model)

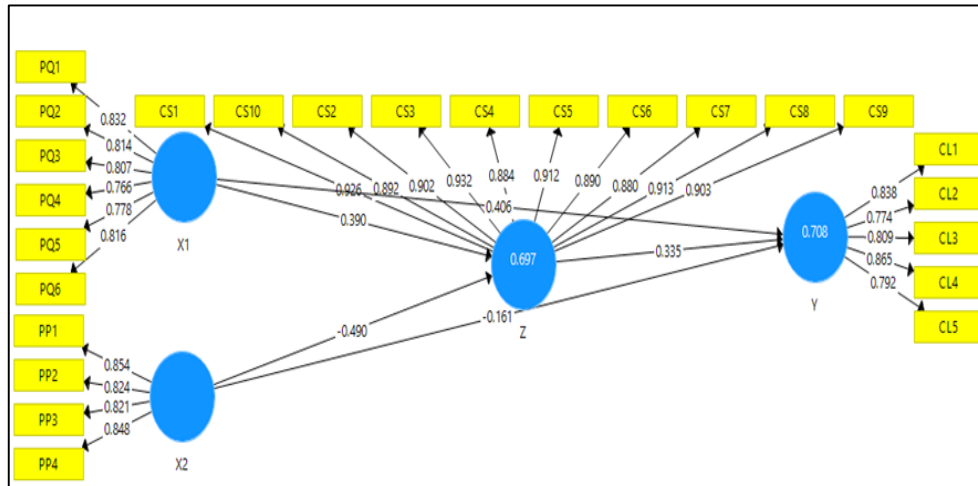#### 3.1.1. Test of validity

An indicator that is declared valid when the load factor value of the target variable exceeds 0.7. The output of SmartPLS3 should look like this:

Table 1 Outer loading result

No.	Indicators	X1	X2	Y	Z
1	CL1			0.836	
2	CL2			0.774	
3	CL3			0.809	
4	CL4			0.865	
5	CL5			0.792	
6	CS1				0.926
7	CS2				0.902
8	CS3				0.932
9	CS4				0.884
10	CS5				0.912
11	CS6				0.890
12	CS7				0.880
13	CS8				0.913
14	CS9				0.903
15	CS10				0.892
16	PP1		0.854		
17	PP2		0.824		
18	PP3		0.821		
19	PP4		0.848		
20	PQ1	0.832			
21	PQ2	0.814			
22	PQ3	0.807			
23	PQ4	0.766			
24	PQ5	0.778			
25	PQ6	0.816			

Source: processed field data

Correlation between object score and variable score is used to test the validity of the reflex sign. Measurements using reflective characters mean that when different characters of the same variable are extruded, they are extruded with the label of one variable. Reflective signs are suitable for measuring perception. The desk above shows that the stress factor values exceed recommended value 0.7. Minimum value for the PQ4 indicator is 0.766. Thus, the characters used in this test have legitimate or converged validity. Below is a load factor plot for each indicator;

Source: processed by Smart PLS3

Figure 2 Loading factor value

In addition, the reflection indicator must also be tested for the validity of its identification by using the cross loading value:

Table 2 Cross loading result

No.	Indicators	X1	X2	Y	Z
1	CL1	0.714	-0.719	0.838	0.701
2	CL2	0.571	-0.481	0.774	0.521
3	CL3	0.631	-0.602	0.808	0.648
4	CL4	0.710	-0.650	0.866	0.707
5	CL5	0.611	-0.602	0.782	0.591
6	CS1	0.729	-0.750	0.698	0.828
7	CS2	0.703	-0.713	0.711	0.802
8	CS3	0.700	-0.731	0.698	0.832
9	CS4	0.714	-0.716	0.726	0.884
10	CS5	0.725	-0.744	0.713	0.812
11	CS6	0.662	-0.661	0.658	0.880
12	CS7	0.705	-0.732	0.722	0.880
13	CS8	0.717	-0.718	0.721	0.813
14	CS9	0.683	-0.755	0.712	0.803
15	CS10	0.719	-0.714	0.703	0.882
16	PP1	-0.676	0.864	-0.669	-0.714
17	PP2	-0.696	0.824	-0.641	-0.604

18	PP3	-0.659	0.821	-0.584	-0.650
19	PP4	-0.650	0.848	-0.630	-0.709
20	PQ1	0.832	-0.611	0.645	0.651
21	PQ2	0.814	-0.638	0.683	0.661
22	PQ3	0.807	-0.659	0.695	0.695
23	PQ4	0.766	-0.627	0.603	0.536
24	PQ5	0.778	-0.685	0.592	0.573
25	PQ6	0.818	-0.638	0.609	0.629

Source: processed field data

The indicator is validated when the load factor of the target variable is higher than the load factor of other variables. The desk above shows that the load factor of the X1 indicators (PQ1 to PQ6) has a higher load factor than the other variables. For the sake of explanation, the stress factor of PQ1 of X1 is 0.832 higher than the stress factor of X2 (-0.611), Y (0.645), and Z (0.651). The same applies to other indicators. Therefore, potential contracts better predict one block indicator than the other block indicators. Another way to validate the identification is to look at the square root of the mean extract variance value. The recommended value is 0.5 or more.

Table 3 Average Variance Extracted

No.	Variables	AVE
1	X1	0.644
2	X2	0.700
3	Y	0.667
4	Z	0.816

Source: processed field data

The table above shows AVE values greater than 0.5 for all variables. The minimum AVE value for the X1 variable (product quality) is 0.644.

3.1.2. Test of reliability

Reliability checks are completed with the aid of using analyzing the configuration reliability values from the indicator block that measures the variables. Composite reliability outcomes display first-rate values above 0.7. Below is the output of composite reliability:

Table 4 Composite Reliability

No.	Variables	Composite Reliability
1	X1	0.916
2	X2	0.903
3	Y	0.909
4	Z	0.978

Source: processed field data

The above table indicate that the score of composite reliability is extra than 0.7 for all variables. This shows that all variables inside the predicted version meet the criteria for the validity of the discriminant. The lowest score of composite reliability for the X2 variable (price perception) is 0.903.

Test of reliability can be enhanced with Cronbach's Alpha. Output of SmartPLS-3 gives the results below:

Table 5 Cronbach's Alpha

No.	Variables	Cronbach's Alpha
1	X1	0.889
2	X2	0.857
3	Y	0.875
4	Z	0.975

Source: processed field data

The encouraged value is above 0.6, and the desk above suggests value of Cronbach`s alpha is above 0.6 for all variables. The lowest value for the X2 variable (price perception) is 0.857.

3.2. Testing the Structural Model (Inner Model)

After the expected model meets the standard of the external model, the following step is to check the structural model. R-Square values for the variables are:

Table 6 R-Square

No.	Variables	R-Square
1	Y	0.708
2	Z	0.697

Source: processed field data

The table above shows the value of the Z variable 0.697. This means that X1 and X2 can explain the 69.7% Z variance. The value of R is also in Y and is affected by X1, X2 and Z, that is 0.708.

The test of hypothesis is as below table:

Table 7 Path Coefficients

No.	Variables	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Value
1	X1 → Y	0.406	0.410	0.090	4.490	0.000
2	X1 → Z	0.390	0.384	0.078	4.986	0.000
3	X2 → Y	-0.161	-0.150	0.111	1.457	0.146
4	X2 → Z	-0.490	-0.493	0.081	6.034	0.000
5	Z → Y	0.335	0.342	0.095	3.514	0.000
6	X1 → Z → Y	0.131	0.130	0.042	3.093	0.002
7	X2 → Z → Y	-0.164	-0.170	0.060	2.754	0.006

Source: processed field data

From Tables above shows that:

- The connection between X1 and Y is significant because P-values 0.000 (<0.05). The Value of original sample is 0.406 which mean that the direction of the connection between X1 and Y is positive. Thus, H1 is accepted.
- The connection between X1 and Z is significant because P-values 0.000 (<0.05). The value of original sample is 0.390 which mean that the direction of the connection between X1 and Z is positive. Thus, H2 is accepted.
- The connection between X2 and Y is not significant because P-values 0.146 (> 0.05). Thus, H3 is rejected.
- The connection between X2 and Z is significant because P-values 0.000 (<0.05). The value of original sample is -0.490 which mean that the direction of the connection between X2 and Z is negative. Thus, H4 is accepted.

- The connection between Z and Y is significant because P-values 0.000 (<0.05). The value of original sample is 0.335 which mean that the direction of the connection between Z and Y is positive. Thus, H5 is accepted.
- The connection between X1 and Y through Z is significant because P-values 0.002 (<0.05). The value of original sample is 0.131 which mean that the direction of the connection between X1 and Y through Z is positive. Thus, H6 is accepted.
- The connection between X2 and Y through Z is significant because P- values 0.000 (<0.05). The value of original sample is -0.164 which mean that the direction of the connection between X2 and Y through Z is negative. Thus, H7 is accepted.

Therefore, in order to attract loyal customers to this company, it is necessary to always be aware of the quality of the product and emphasize it again. In addition, can apply Quality Function Deployment (QFD) to find the quality you want [18]. In this case, the company translates the customer's voice into existing process parameters. By identifying key quality aspects (CTQs) that are properly managed, product quality is adequately maintained to meet customer expectations. Implementing short interval control through a good management control reporting system to keep the process running well so that product quality is maintained [19]. Price perception does not directly affect customer loyalty, but price perception does affect customer loyalty through customer satisfaction. When a customer perceives a very good competitive in price, customer satisfaction increases, which in turn increases loyalty to the company. To make the price more competitive, it is necessary to carry out a value stream mapping of the entire existing process to reduce non added value and increase its added value, reduce the various wastes that arise by running a continuous improvement program. This continuous improvement can be done from small things to big things that provide cost saving to the company.

3.3. Managerial Implication

The results of this study enrich information related to the relationship between product quality, price perceptions and consumer loyalty. In addition, the suggestion is to apply Quality Function Deployment (QFD) to find the quality that consumers want and translate the voice of consumers into existing process parameters by identifying key quality aspects (CTQs) and managing them properly so that product quality will be maintained adequately to meet consumer expectations. The findings of this study can help conduct further research.

4. Conclusion and Recommendation

The results of testing and analysis provide the following conclusions: product quality had a direct and positive significant effect on customer loyalty and customer satisfaction. While price perception has no significant effect on customer loyalty, but price perception has a direct and negative significant effect on customer satisfaction, customer satisfaction has a direct and positive significant effect on customer loyalty, customer satisfaction can mediate the relationship between product quality and customer loyalty positively. Customer satisfaction can mediate the relationship between price perception and customer loyalty negatively.

It is suggested to the 'KFI' company that manufactures cooling fans with the 'K' brand, from the above relationship, to optimize Customer Loyalty it is necessary to pay attention to the following variables:

- Product Quality: start by implementing the quality function deployment (QFD), where from the voice of the customer then the company translates it into existing design and process parameters. By determining critical to quality (CTQ) aspects and controlling them properly, product quality will be well maintained so that it can meet customer expectations, especially related to product performance and product aesthetics.
- Price Perception: to make prices more competitive, it is necessary to map the value stream of all existing processes to reduce non value-added and increase value-added activities, reduce various wastes that arise by running a continuous improvement program. This continuous improvement can be started from small things to big things that will provide cost savings for the company.

Compliance with ethical standards

Acknowledgments

Disclosure of conflict of interest

The Author wish to declare that none has any interest to disclose.

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