*Journal of Optimization in Industrial Engineering*
*Vol.16, Issue 1, Winter & Spring 2023, 141–145*
*DOI: 10.22094/JOIE.2023.1976079.2026*

Research Article

# Analysis Of The Influence Of Price And Product Performance, On The Decision Of Heavy Equipment Customer Buying Excavator Products ABC PT. XYZ

**Nurhayati Rauf [a], Ahmad Padhil [b,*],Ade Rasma Yulyanda [c]**

[a,b,c] *Departement of Industrial Engineering, Faculty of Industrial Technology, Muslim University of Indonesia, Makassar, Indonesia*

Received 06 January 2023 ; Revised 22 February 2023; Accepted 01 March 2023

**Abstract**

The influence of price and product performance (quality) is closely related to customer value in determining the choice of how valuable the product is to customers so that customers benefit from the costs incurred to obtain products or services so that an emotional bond between customers and sellers will also be formed in the form of economic benefits from a product or service. product. PT. XYZ is a heavy equipment distributor company. XY which is sold by the main distributor in Indonesia has now developed into one of the main players in the domestic industrial sector, one of its products is the Excavator which is a superior product with the ability to work in all sectors. In this study, multiple linear regression was used, to determine the relationship between the two independent and dependent variables, whether the independent variable affects the dependent variable or not. Price and product performance have a significant effect on customer decisions to buy heavy equipment Excavator and it is concluded that product performance is more influential than price, on customer decisions

***Keywords*:** Price; Product Performance; Decision; Multipe Linear Regression

## 1. Introduction

The heavy equipment industry in Indonesia is one of the domestic industries that contributes to the mining sector, in this sector showing the highest growth chart. General Chair of the Indonesian Heavy Equipment Industry Association (HINABI), stated that heavy equipment production is projected to continue to grow at a high rate, despite being burdened by soaring material costs due to rising commodity prices on the world market, and demand continues to accelerate even though from the supply side, producers must make adjustments, according to (Jamaludin, 2022). This will indirectly cause Heavy Equipment Consumers to be very careful in choosing the heavy equipment they will buy for construction, mining and other works.

There are several heavy equipment companies in Indonesia such as PT. United Tractors, PT. Trakindo CAT, PT. Daya Kobelco Construction Machinery Indonesia and others. The existence of several heavy equipment companies can trigger every heavy equipment manufacturer to compete fiercely, so that they can survive and develop from time to time while preparing the right strategy such as a sales system, promotion system, service system, fast transaction process and provides convenience in the management process. various permits and after-sales services.

Excavators sold by major distributors in Indonesia have now developed into one of the main players in the domestic industrial sector, one of their products is ABC Excavator which is a superior product with the ability to work in all sectors. This 21ton excavator has high productivity with more efficient fuel consumption, so it will provide the best solution according to customer needs. Based on product performance, customers who choose ABC excavator products are based on the need for heavy equipment that works with regular use of tools, such as in the mining sector. However, if the need is not too severe, such as in the construction sector, competitors' products can be an option, because the equipment does not operate continuously.

Besides that it has a more competitive price comparison and in the research researched by (Arfianti and Endera, 2017), shows that product quality variables and price variables have a significant and positive effect on the choice of heavy equipment.

The same research was also conducted (Giardo, Zainul, and Sunarti, 2017), showing that product quality (X) has a significant effect on purchasing decisions (Z) and consumer satisfaction (Y), purchasing decisions (Z) have a significant effect on customer satisfaction (Y ). ), based on the research results it is hoped that every producer as a product maker is expected to maintain and improve product quality, so that it becomes a strong reason for consumers to buy the products produced, in this study it is hoped that there will be consideration in product selection, especially heavy equipment that even though the product is expensive but directly proportional to the performance, whether the machine is worth buying or not

## 2. Research Methodology

### *2.1. Research place and time*

The place of research is at the company, PT. United Tractor Makassar Branch, which is located at Jl. Urip Sumoharjo Makassar City, South Sulawesi. The time of this research is for one month starting from March 16, 2022 to May 15, 2022. Types and Sources of Data:

a. Primary Data

Primary data is data that is collected and data processing will be carried out, in this study obtained from the results of a

*Corresponding author Email address: ahmad.padhil@umi.ac.id

questionnaire that was distributed to respondents, namely heavy equipment customers who bought ABC Excavators at PT. United Tractor Makassar Branch, by taking perceptions about prices and perceptions about performance, especially in the mining sector.

b. Secondary Data

Secondary data is data that researchers obtain from existing sources, namely those that have previously been collected and reported by other parties, such as data on Excavator Purchases in the Mining Sector and Excavator Prices, as well as literature studies from journals.

*2.2. Data analysis method*

a. Population

According to (Arikunto,2006), the population is a complete group of all elements to be tested along with their characteristics where the properties, characteristics, or things that are owned by the elements that are the object of research.

This study, using population techniques by taking the entire complete collection of respondents. The data used is customer data that buys ABC Excavator, in the mining sector, the data is provided by the Company

b. Questionnaire

According to (Ilmiyana,2021), statistical data collection in research uses a questionnaire as a data collection method which is a series of questions that are submitted to respondents to fill out. Collecting statistical data using a questionnaire with the help of Microsoft Form as a data collection method which is a series of statements using a Likert scale of 1 to 5.

c. Validity Test and Reliability Test

Based on journal quotes (Eka, 2017), that according to (Ghozali, 2015) the validity test is used to measure whether or not a questionnaire is valid. Validity testing, using Pearson correlation, which is a decision regarding the validity of the questionnaire items with the basis for making decisions to test the validity of the questionnaire items

If r count is positive and r count > r table then the questionnaire is valid.

If r count is not positive and r count < r table then the questionnaire is not valid

The reliability test according to (Ghozali,2015) in research (Eka, 2017), is a tool to measure a questionnaire which is an indicator of a variable. It is said if reliable and unreliable as follows:

Reliable (feasible) if Cronbach alpha > 0.60 and

Not reliable (not feasible) if Cronbach alpha < 0.60

d. Multiple Linear Regression

According to (Statmat,2020), multiple linear regression is a regression that connects one Y variable to two X variables, in this study. The general form of multiple linear regression can be written

$Y = a + b_1X_1 + b_2X_2 + \ldots + e$ (*error*).

Information:

a = constant (Y-intercept)

Y = dependent variable

X1, X2… XK = Independent variable

b = Constant

bi = Estimating coefficient

As for what can affect the decision ($Y_1$), the purchase of heavy equipment ABC excavator products can be influenced by:

several factors, namely, price ($X_1$), and product performance ($X_2$). Each independent and dependent variable above still cannot be measured directly. The variables used in this study are as follows:

1. Price variable ($X_1$),
2. Product performance (($X_2$),
3. Customer decision ($Y_1$)

calculate the value of b, b1, b2 can be used as a matrix as follows:

$$A = \begin{bmatrix} n & \sum X_1 & \sum X_2 \\ \sum X_1 & \sum {X_1}^2 & \sum X_1X_2 \\ \sum X_2 & \sum X_2X_1 & \sum {X_2}^2 \end{bmatrix}$$

$$b = \begin{bmatrix} b_0 \\ b_1 \\ b_2 \end{bmatrix} H = \begin{bmatrix} \sum Y \\ \sum X_1Y \\ \sum X_2Y \end{bmatrix}$$

Information :

A = matrix (known)

H = column vector (known)

B = column vector (unknown)

Variable b can be solved in the following way:

$b = H$

$b = A^{-1}. H$

a. T Test

In research (Eka, 2017), the t-test according to (Sugiyono, 2014), the t-test basically shows how far the influence of one independent variable individually in explaining the variation of the dependent variable

b. F Test

In research (Eka, 2017), the F test according to (Sugiyono, 2014), aims to determine the effect of independent variables simultaneously. The test is carried out through the F test by comparing $F_{count}$(Fh) with $F_{table}$ (Ft), at =0.05. If the calculation results show:

Fh>Ft,so $H_0$ reject and $H_a$ received

Fh<Ft, so $H_0$ received and $H_a$ reject

c. SPSS (Statistical Product And Service Solution).

**3.** In thesis research (Afi, 2022), SPSS is an application capable of statistical analysis and a data management system in a graphical environment using descriptive menus and simple dialog boxes so that it is easy to understand how to operate.

## 3. Result

These variables need indicators that shape the perception of each variable. Based on this explanation, the indicators of the price variable ($X_1$) product performance ($X_1$), and purchasing decisions ($Y_1$) are described as follows:

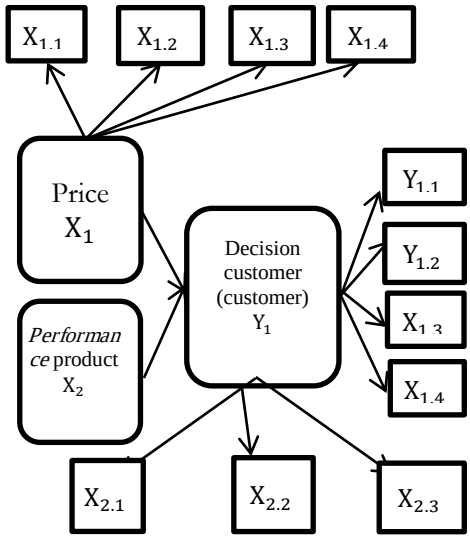


Fig. 1. Conceptual framework

The research was conducted using a questionnaire given to the entire population of 24 respondents based on the data provided by the company at the research site.

Filling out the questionnaire is done by marking the statement items using a Likert scale

Table 1
Customer Recapitulation Data About Prices

| No. Respondents | Price (x1) | | | | Total (x1) |
|---|---|---|---|---|---|
| | X1.1 | X1.2 | X1.3 | X1.4 | |
| 1 | 4 | 4 | 5 | 4 | 17 |
| 2 | 4 | 4 | 4 | 4 | 16 |
| 3 | 3 | 4 | 5 | 4 | 16 |
| 4 | 3 | 4 | 4 | 5 | 16 |
| 5 | 5 | 5 | 4 | 4 | 18 |
| 6 | 4 | 4 | 4 | 5 | 17 |
| 7 | 3 | 4 | 3 | 5 | 15 |
| 8 | 4 | 4 | 3 | 4 | 15 |
| 9 | 4 | 4 | 4 | 4 | 16 |
| 10 | 3 | 4 | 3 | 4 | 14 |
| 11 | 3 | 4 | 2 | 4 | 13 |
| 12 | 2 | 4 | 3 | 4 | 13 |
| 13 | 3 | 4 | 3 | 4 | 14 |
| 14 | 2 | 4 | 3 | 4 | 13 |
| 15 | 3 | 4 | 2 | 4 | 13 |
| 16 | 2 | 4 | 3 | 5 | 14 |
| 17 | 3 | 4 | 3 | 4 | 14 |
| 18 | 3 | 4 | 3 | 4 | 14 |
| 19 | 3 | 4 | 3 | 4 | 14 |
| 20 | 3 | 4 | 3 | 5 | 15 |
| 21 | 3 | 4 | 3 | 5 | 15 |
| 22 | 3 | 4 | 4 | 5 | 16 |
| 23 | 3 | 4 | 3 | 4 | 14 |
| 24 | 2 | 3 | 1 | 1 | 7 |

Based on the data obtained from the results of the microsoft form, a tabulation was made in the form of table 1, to facilitate data collection on customer data about prices. So that it can be analyzed how much the number of each statement on each indicator can be.

Table 2
Customer Recapitulation Data About Product Performance

| No. Respondents | Decision *customers (y1)* | | | | Total (y1) |
|---|---|---|---|---|---|
| | Y1.1 | Y1.2 | Y1.3 | Y1.4 | |
| 1 | 4 | 4 | 5 | 5 | 18 |
| 2 | 4 | 4 | 4 | 5 | 17 |
| 3 | 3 | 4 | 4 | 4 | 15 |
| 4 | 5 | 5 | 4 | 4 | 18 |
| 5 | 5 | 5 | 5 | 5 | 20 |
| 6 | 4 | 4 | 4 | 4 | 16 |
| 7 | 5 | 5 | 5 | 4 | 19 |
| 8 | 4 | 4 | 3 | 4 | 15 |
| 9 | 4 | 4 | 4 | 4 | 16 |
| 10 | 4 | 5 | 4 | 4 | 17 |
| 11 | 4 | 4 | 2 | 4 | 14 |
| 12 | 4 | 3 | 4 | 4 | 15 |
| 13 | 4 | 4 | 3 | 4 | 15 |
| 14 | 4 | 3 | 3 | 4 | 14 |
| 15 | 4 | 5 | 4 | 4 | 17 |
| 16 | 5 | 4 | 4 | 4 | 17 |
| 17 | 5 | 4 | 3 | 4 | 16 |
| 18 | 5 | 4 | 4 | 4 | 17 |
| 19 | 5 | 4 | 3 | 4 | 16 |
| 20 | 5 | 4 | 3 | 4 | 16 |
| 21 | 5 | 4 | 4 | 4 | 17 |
| 22 | 5 | 4 | 3 | 4 | 16 |
| 23 | 5 | 4 | 4 | 4 | 17 |
| 24 | 1 | 2 | 3 | 3 | 9 |

Based on the data obtained from the results of the microsoft form, a tabulation was made in the form of table 2, to facilitate data collection on customer data about product performance. So that it can be analyzed how much the number of each statement on each indicator can be.

Table 3
Customer Recapitulation Data About Customer Decisions

| No. Respondents | *Performance* product (x2) | | | Total (x2) |
|---|---|---|---|---|
| | X2.1 | X2.2 | X2.3 | |
| 1 | 4 | 4 | 5 | 18 |
| 2 | 4 | 4 | 4 | 17 |
| 3 | 3 | 4 | 4 | 15 |
| 4 | 5 | 5 | 4 | 18 |
| 5 | 5 | 5 | 5 | 20 |
| 6 | 4 | 4 | 4 | 16 |
| 7 | 5 | 5 | 5 | 19 |
| 8 | 4 | 4 | 3 | 15 |
| 9 | 4 | 4 | 4 | 16 |
| 10 | 4 | 5 | 4 | 17 |
| 11 | 4 | 4 | 2 | 14 |
| 12 | 4 | 3 | 4 | 15 |
| 13 | 4 | 4 | 3 | 15 |
| 14 | 4 | 3 | 3 | 14 |
| 15 | 4 | 5 | 4 | 17 |
| 16 | 5 | 4 | 4 | 17 |
| 17 | 5 | 4 | 3 | 16 |
| 18 | 5 | 4 | 4 | 17 |
| 19 | 5 | 4 | 3 | 16 |
| 20 | 5 | 4 | 3 | 16 |
| 21 | 5 | 4 | 4 | 17 |
| 22 | 5 | 4 | 3 | 16 |
| 23 | 5 | 4 | 4 | 17 |
| 24 | 1 | 2 | 3 | 9 |

Based on the data obtained from the results of the microsoft form, then a tabulation is made in the form of table 3, to facilitate data collection on customer data about product performance. So that it can be analyzed how much the number of each statement on each indicator can be.

## 4. Discussion

### *4.1 Validity test*

Table 4
Validity test results, indicators

| Indicator | item | Score $R_{count}$ | Score $R_{table}$ | Sig | Information |
|---|---|---|---|---|---|
| Price | $X_{1.1}$ | 0.650 | 0,5151 | 0,001 | Valid |
| | $X_{1.2}$ | 0.811 | 0,5151 | 0,000 | Valid |
| | $X_{1.3}$ | 0,688 | 0,5151 | 0,000 | Valid |
| | $X_{1.4}$ | 0,733 | 0,5151 | 0,000 | Valid |
| *Performance* Product | $X_{2.1}$ | 0,733 | 0,5151 | 0,000 | Valid |
| | $X_{2.2}$ | 0,779 | 0,5151 | 0,000 | Valid |
| | $X_{2.3}$ | 0,626 | 0,5151 | 0,001 | Valid |
| Decision *Customer* | $Y_{1.1}$ | 0,717 | 0,5151 | 0,000 | Valid |
| | $Y_{1.2}$ | 0,790 | 0,5151 | 0,000 | Valid |
| | $Y_{1.3}$ | 0,628 | 0,5151 | 0,001 | Valid |
| | $Y_{1.4}$ | 0,793 | 0,5151 | 0,000 | Valid |

The validity test was conducted to determine whether the research had reflected the measured variables or indicated a conformity between the measuring instrument and the measured objective. The measurement of the validity is directed to the customer's decision to buy an ABC excavator.
$R_{count}$ is positive and $R_{count} > R_{table.}$
0.650 positive and 0.650 > 0.5151
So, the questionnaire is valid

### *4.2 Data Reliability Test*

Table 5
Reliability Test Results

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .889 | 11 |

The results of the reliability test were carried out using Cronbach's alpha.
Is known :
*Cronbach's Alpha* = 0.889
N of Items = 11
$R_{alpha}$ > 0,60 = reliabel
Solution : $R_{alpha}$ > 0,60
0.889 > 0,60
Conclusion: there is consistency in the answers of the respondents, and the data is reliable because 0.889 > 0.60

### *4.3 Effect Test analysis with multiple linear regression method*

Table 6
Multiple Linear Regression Analysis Test Results

**Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | .858 | 1.776 | | .483 | .634 |
| | X1 | .397 | .137 | .403 | 2.898 | .009 |
| | X2 | .778 | .194 | .559 | 4.016 | .001 |

a. Dependent Variable: Y1

Multiple linear regression analysis is used to analyze the effect of price variables, product performance, on customer decisions. Multiple linear regression equations can be obtained as follows:
$Y = a + b_1X_1 + b_2X_2 + \ldots + e$
$Y = 0{,}858 + 0.397\ X_1 + 0{,}778\ X_2$

### *4.4 T Test*

Table 7
Variable T Test Results $X_1$ To Y

**Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | T | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 4.882 | 1.906 | | 2.562 | .018 |
| | X1 | .773 | .130 | .786 | 5.960 | .000 |

a. Dependent Variable: Y1

Based on the calculation results, the T_count is 5.960 > $T_{table}$ of 2.81876 or 5.960 > 2.81876, then $H_0$ is rejected and $H_a$ is accepted. This means that the price has a significant effect on the customer's decision to buy the ABC Excavator

Table 8
T-Test Results of Variable $X_2$ Against Y

**Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 1.939 | 2.008 | | .966 | .345 |
| | X2 | 1.162 | .163 | .835 | 7.117 | .000 |

a. Dependent Variable: Y1

Based on the calculation results, the $T_{count}$ is 7.117 > $T_{table}$ of 2.81876 or 7.117 > 2.81876, then $H_0$ is rejected and $H_a$ is accepted. This means that product performance has a significant effect on customer decisions to buy ABC Excavator

### *4.5 F Test*

Table 9
F Test Results

**Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | T | Sig. |
|---|---|---|---|---|---|---|
| 1 | (Constant) | 4.882 | 1.906 | | 2.562 | .018 |
| | X1 | .773 | .130 | .786 | 5.960 | .000 |

a. Dependent Variable: Y1

Test was conducted to analyze the effect of price and product performance variables simultaneously on customer decisions. Based on the calculation results, the $F_{count}$ value is 38,044 > $F_{table}$ 5,78 (38.044 > 5.78) then $H_0$ is rejected and $H_a$ is accepted. This means that there is a simultaneous influence of price and product performance on purchasing decisions.

## 5. Conclusion

This study intends to determine whether the price and product performance affect the customer's decision to buy an ABC excavator.

As for the results this study after completing all steps of data collection, data processing and testing, it can be concluded as follows:

1. Price has a significant effect on customer decisions to buy ABC excavator heavy equipment. T_hitung > T_table which is 5.960 > 2.81876 then, H_0 is rejected and H_a is accepted, there is an effect of product price on customer decisions.
2. Product performance has a significant effect on customer decisions to buy ABC excavator heavy equipment. T_hitung > T_table which is 7.117 > 2.81876 then, H_0 is rejected and H_a is accepted, there is an effect of product performance on customer decisions.
3. From the calculation results between the effect of performance and price, the value of the Effect of Performance is 7.117> 5.960 So the company must increase product performance before deciding to increase prices

## 6. Suggestions

Based on the conclusions of the analysis and the conclusions that have been described previously, the researcher humbly provides suggestions to be taken into consideration, as follows:

1. The company can review the pricing on ABC excavator products in accordance with the market share that is used as the target market because, in this study, it shows that price affordability still has a lot of customer ratings that do not agree with as many as 14 respondents from a total of 24 respondents.
2. For further researchers, who will make reference to this research, the researcher suggests that you should add other variables that can influence the customer's decision to buy the product.

## Acknowledgments

The corresponding author would like to express the sincerest gratitude to department of industrial engineering faculty of industrial technology , Muslim University of Indonesia.

## References

Afdahal Anan, Arifin. (2018). The Influence of Price, Product and Promotion on Purchase Decisions for Yamaha Motorcycles at PT. Suracojaya Abadi Motor Cab. Antang. Faculty of Economics and Business. Makassar: Muhammadiyah University. p.11-12

Afi, Rafita. (2022). SPSS (Statistical Product And Service Solution).[online].Available:https://www.academia.edu/25676274/BAB_II_Landasan_Teori_SPSS_dan_Analisis_Cluster. [March 2022]

Anwar, Arfianti Novita and Endera. (2017). Analysis of the Effect of Product Quality and Price Factors on Consumer Satisfaction on Excavator Products PT. Daya Kobelco Construction Machinery Indonesia In Riau. Journal of the College of Economics (STIE). Indonesian lamp. Vol.5. Number 1. p.54-124

Arikunto, Suharsimi. (2006). Research procedure. Revised Edition VI. PT. Rineka Cipta. Jakarta. p.151

Arumsari, Dheany. 2012. "Analysis of the Effect of Product Quality, Price and Promotion on Purchase Decisions for Aqua Brand Bottled Drinking Water (Amdk). Faculty of Economics and Business. Semarang: Diponegoro University. p.16-45

Basu Swastha, and Hani Handoko. (2011) Marketing Management-Behavioral Analysis. Consumer. Yogyakarta : BPFE. p.13-106-15

Eka, Agustina. (2017). The Influence of Product Quality, Price, and Brand Image on One Push Vape Purchase Decisions in Kertosono. Nusantara University PGRI Kediri. Kediri. Vol. 01. No. 09

Ikhsan Faozi and SB Handayani. (2019). Analysis of Purchase Decisions Influenced by Promotional Prices and Service Quality At PT. Building the Motherland of Semarang. STIE Dharmaputra. Semarang. Vol. 2. No.47. p.125

Ilmiyana, Rizky. 2021. How to Make Questionnaires in Research [online]. Available. https://blog.ipbtraining.com/blog/cara-make-kuesioner-dalam-penelitian/ [March 2022]

Jumiati and Toto Sugiarto. (2017). Analysis of the Effect of Price and Distribution Channels on Purchase Decisions of Banjarbaru Business Consumers at PT. Indomarco Adi Prima Banjarmasin Branch. Banjarmasin. Vol.3. No.3. p.98

Kotler, Philip and Gary Armstrong. (2016). Principles of Marketing Edition13. Volume 1. Jakarta: Erlangga. p.177

Kotler, Philip and Kevin Lane Keller. (2009) Marketing Management. XIII Edition. Volume1. Jakarta: Erlangga. p.144-76

Kotler, Philip. Marketing Management. (2005). Millennium Edition. Volume 3. Jakarta: Publisher of the index. Page 22-23

Permadi, Giardo, Son Zainul and Arifin Sunarti. (2017). The Effect of Product Quality on Purchase Decisions and Its Impact on Consumer Satisfaction. Faculty of Administrative Sciences. Brawijaya University. Vol.5. Number 1. Thing. 67-68.

**This article can be cited:** Rauf, N., Padhil, A., & Yulyanda, A. (2023). Analysis of The Influence Of Price And Product Performance, On The Decision Of Heavy Equipment Customer Buying Excavator Products ABC PT. XYZ. *Journal of Optimization in Industrial Engineering, 16*(1), 141-145. doi: 10.22094/joie.2023.1976079.2026