**International Journal of Economics, Business and Accounting Research (IJEBAR)**
**Peer Reviewed – International Journal**
**Vol-5, Issue-4, 2021 (IJEBAR)**
**E-ISSN: 2614-1280 P-ISSN 2622-4771**
https://jurnal.stie-aas.ac.id/index.php/IJEBAR

# PRODUCT ADVANTAGE ANALYSIS BASED ON MARKET UNDERSTANDING AT PT SAMATOR GAS KALIWUNGU KENDAL

**Ageng Prasetyo[1], Nurkholik[2]**
[1,2]Universitas Selamat Sri Kendal, Indonesia
*Email: ageng_pras61@gmail.com*

***Abstract:*** *This study aims to analyze how the company need to understand about the customers expectation before the new product was launched to the market place, especially at the PT Samator Gas, Kaliwungu, Kendal. The capacity of the company to understand the market was called the market knowledge competence. Its concist of three major aspects such as customer knowledge competence, competitor knowledge competence and the interface between R&D with marketing department. The higher market knowledge competence has been estimated can creates the higher the product excellence in the market place. And as the result the product excellence may increase the marketing performance, these was inluded sales volume, sales growth and customers growth. The amount of the population on this research were 500 customers of the company. But the sample were 100 customers, which devided into two categories of monthly purchasing amount. The result of this research were the higher of customer knowledge competence, the higher of competitor knowledge competence and the higher of the relation R/D and marketing influenced the higher of product excellence. So the higher of product excellence influenced the higher of marketing performance.*

***Keywords:*** *marketing knowledge competences, product excellence, marketing performance*

## 1. Introduction

The ability to understand the market is an ability to realize and combine market understanding skills, which include the ability to understand customers, the ability to understand competitors and the relationship between R&D and marketing (Tiger Li and RJ Calantone, 2010). The ability to understand customers shows a series of activities that embody customer understanding that relates to current and future customer interests in the producer's goods and or services. Competence understanding includes a series of activities that create an understanding of the policies and goods and services of other producers. The relationship between marketing research and development is guided by the process by which the R&D and marketing departments interact and are interrelated.

In recent years, it is possible for several companies to link market understanding ability and innovation of goods and or services as an effort to enhance their competitive ability. From a number of good companies that can be used as a reference are as follows: PT Samator Gas, Kaliwungu, Kendal is a producer and distributor of industrial gases, such as Oxygen, Nitrogen, Argon, Hydrogen and Special and Mixed Gases. In two years 2017 to 2019 there was a decrease in sales turnover due to a decrease in customer demand for gas cylinders and tanks. In early 2020, it developed an "on site plant" product, namely a small-scale air separation plant to meet the demands of large customers, such as bodybuilders, docks, fabricators and exporters of fresh

products such as vegetables, fish and fruits. The advantages of this product are more economical prices, independent supply at the user's location, minimal loss of weight, regular gas supply and higher purity than cylinder gas. The R&D section uses data from customers' suggestions on gas cylinders or liquid products. Which concerns the continuity of supply, gas purity, and losses. as well as data on the limitations of the volume of the cylinder or tank and the height of the loss, has developed a new product concept in the form of a small-scale air engine. The sample selected was 20 (twenty) large customers from 100 existing customers, with criteria that have the importance of self-supply through machines. small scale air separator or "on site plant".

## 2. Research Methods

In quantitative research, activities to carry out data analysis are common activities to support the proof of existing hypotheses. Activities carried out in data analysis include sorting data according to the size and type of variables, tabulating data according to all sample variables, presenting data for each variable, performing data calculations and proving existing hypotheses (Sugiyono, 2011).

The method used in data analysis in this study is a structural equation model with the AMOS version 4.0 application package in modeling testing and proving hypotheses. Augusty Ferdinand (2010) said that the structural equation model is a combination of statistical techniques that shows the testing of a relationship between variables. In conducting SEM analysis, it is necessary to do the following steps:

**a. Preparation of theoretical model framework**

In this stage, the activity carried out is the development of a model based on strong scientific considerations. Researchers need to carry out scientific exploration based on maximum theoretical studies in order to obtain theoretical considerations on the developed model.

**b. Flowchart preparation**

Preparation of flowcharts is intended to make it easier for researchers to know the causal relationship to be studied. Researchers work with "Constructs" and "Factors" i.e. concepts that have sufficient theoretical power to explain various forms of relationships. Furthermore, the constructs arranged in the flowchart will be divided into two groups, namely exogenous constructs and endogenous constructs. Exogenous constructs are referred to as "Sources variables" or "independent variables" which are not predicted by other variables in a model. The endogenous constructs are factors that are corrected by one or several other endogenous constructs, but exogenous constructs can only be causally related to endogenous constructs.

**c. Flowcharts must be converted into structural equations and measurement model specifications**

Researchers can convert the model specifications into the following equations: The formula for the structural equation is as follows:

$$\text{Endogenous Variable} = \text{Exogenous Variable} + \text{Endogenous Variable} + \text{Error}$$

**d. Choosing an input matrix and estimation technique**

**e. Assess identification problems.**

**f. Evaluation of model suitability criteria**

Table 1 Goodness of fit indexs

| Model suitability index | Limit value |
|---|---|
| $X^2$ - Chi Square | Strive to be low |
| Significant possibility | Greater or equal to 0.05 |
| RMSEA Value | Greater or equal to 0.08 |
| GFI value | Greater or equal to 0.90 |
| AGFI value | Greater or equal to 0.90 |
| CMIN/DF value | Greater or equal to 2.00 |
| TLI value | Greater or equal to 0.95 |
| CFI value | Greater or equal to 0.95 |

**g. Variables and Dimensions**

Table 2 Variables and Research Dimensions

| Variable | Dimension | Symbol |
|---|---|---|
| Customer understanding | - Ownership of customer data<br>- Explanation of customer data<br>- Merging customer data | X1<br>X2<br>X3 |
| Ability to understand competitors | - Competitor data ownership<br>- Explanation of competitor data<br>- Mergers and competitors | X4<br>X5<br>X6 |
| Relationship between R&D and marketing | - Functions of the R&D field in Company<br>- Frequency of R&D relationship with marketing<br>- Technology mastery | X7<br>X8<br>X9 |
| Product excellence | - Product quality<br>- Product toughness<br>- Product specifics | X10<br>X11<br>X12 |
| Marketing performance | - Sales turnover<br>- Sales progress<br>- Customer development | X13<br>X14<br>X15 |

## 3. Discussion

### 3.1. Overview of Respondents

The number of respondents in the study was 100 people from 20 selected companies, with the following details:

Table 3 Description of Respondents

| Customer Category | Position | Amount | % |
|---|---|---|---|
| Large companies | Director<br>Manager | 20<br>30 | 20<br>30 |
| Medium Company | Director<br>Manager | 20<br>30 | 20<br>30 |
| | Amount | 100 | 100 |

Source: primary data processed, 2020

The selected respondents were 20 customers consisting of large and medium customers. Major customers include fresh produce exporters, shipyards and construction companies, while medium customers include hospitals and body repair. The customer category is based on the number of gas intakes per month which is greater than 10,000 M3 for the large customer category and the gas intake per month is greater than 5,000 M3 up to 10,000 M3 for the medium industry category. From each company, 5 (five) respondents were taken which included 2 (two) ) Director and 3 (three) Managers, to fill out the questionnaire provided using a Likert scale. The respondent's position for Director is Director of Operations/Production and Director of Purchasing, for Managers consists of Manager of Production/Operations and Manager of Purchasing/Procurement.

Determination of this sample size is based on the provisions of the Structural Equation Modeling (SEM) model, which is a minimum of 100 samples and then uses 5 observations for each estimated parameter (Augusty Ferdinand, 2010).

Table 4 Measurement Model

| Exogenous Concept (Measurement model) | Endogenous Concept (Measurement model) |
|---|---|
| X1 =ʎ1 customer understanding + e1<br>X2= ʎ2 customer understanding + e2<br>X3= ʎ3 customer understanding + e3<br>X4 =ʎ4 ability to understand competitors + e4<br>X5= ʎ5 ability to understand competitors + e5<br>X6= ʎ6 ability to understand competitors + e6<br>X7= ʎ7 marketing R&D relationship + e7<br>X8= ʎ8 marketing R&D relationship + e8 | X9=ʎ9 marketing R&D relationship + e9<br>X10= ʎ10 product excellence + e10<br>X11= ʎ11 product excellence + e11<br>X12 =ʎ12 product excellence + e12<br>X13= ʎ13 marketing performance + e13<br>X14 =ʎ14 marketing performance + e14<br>X15= ʎ15 marketing performance + e15 |

Structural Model

| |
|---|
| Product Advantage = Y1 Customer Understanding + Y2 Competitor Understanding + Y3 R&D Relationship with Marketing + Z1 |
| Marketing Performance = ß1 Product Advantage + Z2 |

### 3.2. Process and Results of Data Analysis

#### a. Test the Reliability and Validity of the Questionnaire

To determine the consistency of the degree of dependence and stability of the measuring instrument, a questionnaire reliability test was conducted. To determine the validity of the questionnaire, a questionnaire validity test was conducted. The questionnaire was said to be valid if it was able to measure what it was supposed to measure.

Table 5 Summary of Reliability and Validity Calculation Results

| Variable | Cronbach Alpha | Indicator Variables | Corrected Item Total Correlation |
|---|---|---|---|
| Customer understanding | 0,8546 | X1<br>X2<br>X3 | 0,6998<br>0,6865<br>0,7973 |
| Understanding ability Competitor | 0,9504 | X4<br>X5<br>X6 | 0,9036<br>0,8847<br>0,8993 |
| R&D Relations with marketing | 0,9479 | X7<br>X8<br>X9 | 0,8682<br>0,9505<br>0,8591 |
| Product excellence | 0,9105 | X10<br>X11<br>X12 | 0,8830<br>0,7723<br>0,8148 |
| Marketing Performance | 0,9269 | X13<br>X14<br>X15 | 0,8818<br>0,8456<br>0,8262 |

Source: primary data processed, 2020

#### b. Confirmatory Factor Analysis

To investigate the undimensionality of the indicators that explain a factor or construct variable, confirmatory factor analysis is carried out. Next, five variables will be observed to confirm whether the variables together are strong enough to reflect a dimension of a factor.
Confirmed variables are:

1) Construct Variable 1, namely the Customer Understanding Ability variable.
2) Construct Variable 2, namely Competitor Understanding Ability variable.
3) Construct Variable 3, namely the relationship between R&D and Marketing variables.
4) Construct variable 4, namely the Product Advantage variable.
5) Construct Variable 5, namely the Marketing Performance variable.

Table 6 Goodness of Fit Confirmatory Factor Analysis 1
(Market Understanding, Competitor Understanding and Marketing R&D relationship)

| Goodness of fit | Cut off Value | Estimated results | Description |
|---|---|---|---|
| Chi Square | ≤ 36,415 | 22,121 | Good |
| Probability | ≥ 0,05 | 0,572 | Good |
| GFI | ≥ 0,90 | 0,956 | Good |
| AGFI | ≥ 0,90 | 0,917 | Good |
| CFI | ≥ 0,95 | 1,000 | Good |

| | | | |
|---|---|---|---|
| TLI | ≥ 0,95 | 1,003 | Good |
| RMSEA<br>CMIN/DF | ≤ 0,08<br>≤ 2,00 | 0,000<br>0,922 | Good<br>Good |

Source: Primary Data Processed
Description of Chi Square value with df 24 and ά 5% is 36,415

Table 7 Goodness of Fit Confirmatory Factor Analysis 1
(Product Advantage and Marketing Performance Variables)

| Goodness of fit | Cut off Value | Estimated results | Description |
|---|---|---|---|
| Chi Square | ≤ 15,507 | 12,071 | Good |
| Probability | ≥ 0,05 | 0,418 | Good |
| GFI | ≥ 0,90 | 0,952 | Good |
| AGFI | ≥ 0,90 | 0,873 | Marginal |
| CFI<br>TLI | ≥ 0,95<br>≥ 0,95 | 0,982<br>0,966 | Good<br>Good |
| RMSEA<br>CMIN/DF | ≤ 0,08<br>≤ 2,00 | 0,061<br>0,508 | Good<br>Good |

Source: Primary Data Processed
Description of Chi Square value with df 8 and ά 5% is 15.507

**c. Estimation of Goodness of Fit Criteria**

Based on calculations using the AMOS Version 4.0 program for the SEM model, the goodness of fit indices are generated as follows:

Table 8 Evaluation of Criteria for Goodness of Fit Index

| Goodness of fit | Cut off Value | Estimated results | Description |
|---|---|---|---|
| Chi Square | ≤ 105,26 | 94,464 | Good |
| Probability | ≥ 0,05 | 0,183 | Good |
| GFI | ≥ 0,90 | 0,893 | Good |
| AGFI | ≥ 0,90 | 0,845 | Marginal |
| CFI<br>TLI | ≥ 0,95<br>≥ 0,95 | 0,992<br>0,990 | Good<br>Good |
| RMSEA<br>CMIN/DF | ≤ 0,08<br>≤ 2,00 | 0,037<br>0,138 | Good<br>Good |

Source: Primary Data Processed
Description of Chi Square value with df 83 and ά 5% is 105.26

Tabel 9 Standardized Regression of Weight Structural Equation Model
Regression Weight

| | | Estimated | STD Est. | S.E | C.R | P |
|---|---|---|---|---|---|---|
| Superiority Product | Market Understanding | 0,465 | 0,415 | 0,093 | 5,026 | 0 |
| Superiority Product t | Competitor Understanding | 0,249 | 0,24 | 0,079 | 3,145 | 0,002 |
| Superiority Product | Relationship Marketing R&D | 0,422 | 0,382 | 0,093 | 4,525 | 0 |
| Marketing Performance | Superiority Product | 0,687 | 0,853 | 0,071 | 9,648 | 0 |

### 3.3. Hypothesis test

**a. Hypothesis 1 (H1)**

The higher the consumer's understanding ability, the higher the superiority of the product. The estimated parameter between the dimensions of the customer's understanding and the superiority of the product formed produces a CR value (Critical Ratio) = 5.026. This CR value is greater than the critical value with a significance level of 5% which is 1.96. Thus it can be concluded that H1 is accepted at a significance level of 5%. Another way that can be used is to compare the P value (P - value) which is 0 which is less than 0.05, then H1 is the higher the consumer's understanding ability, the higher the superiority of the product is received.

**b. Hypothesis 2 (H2)**

The higher the ability to understand competitors, the higher the superiority of the product. The estimation parameter between the dimensions of the ability to understand competitors and the superiority of the product formed results in a CR value of 3.145. This CR value is greater than the critical value with a significance level of 5%, namely 1.96. Thus, it can be concluded that H2 is the higher the competitor's understanding ability, the higher the superiority of the product is accepted at a significance level of 5%. And can also be used to compare the P value of 0.002 which is less than 0.05.

**c. Hypothesis 3 (H3)**

The value of CR = 4,525 is generated by the estimation parameter between the dimensions of the relationship between R&D and Marketing with the advantages of the product formed. With a significance level of 5%, which is 1.96, it can be interpreted that the CR value is greater than the critical value. Thus H3 is the higher the R&D-marketing relationship, the higher the product advantage can be accepted, at a significance level of 5%. Besides, it can also be compared with the P value (P-value) of 0 which is less than 0.05, so that H3 is accepted.

**d. Hypothesis 4 (H4)**

The value of CR = 9.648 is generated from the estimated parameter between the dimensions of product excellence and the formed marketing performance. Through the 5% significance level which is 1.96 , it can be interpreted that the CR value is greater than the critical value. Thus H4 is the higher the superiority of the product, the higher the marketing performance

can be accepted at a significance level of 5%. Besides, it can be compared with the P-value of 0 which is smaller than 0.05 so that H4 is accepted.

## 4. Conclusion and Suggestions

### 4.1. Conclusion

a. In a condition where the company's ability to understand customers is higher, the superiority of its products will be higher
b. In the condition that the higher the ability to understand competitors owned by the company, the higher the superiority of its products.
c. In conditions, the higher the relationship between R&D and marketing owned by the company, the higher the superiority of its products.
d. In conditions of higher product superiority owned by the company, the higher its marketing performance.

### 4.2. Suggestions

a. Companies need to improve their ability to understand customers because they can strengthen the advantages of their products. This right is related to the regression coefficient value of the dominant construct compared to other constructs. Improving the ability to understand customers is carried out by conducting customer surveys (customer surveys), holding customer gathering events and responding to customer suggestions (input).
b. The ability to understand competitors needs to be improved in the development of new products so that these new products have an advantage in competing both in terms of low costs and uniqueness.
c. The results of the analysis show that the frequency indicator of the relationship between R&D and marketing needs to be maintained, in order to create a strong synergy in the pouring of creative ideas in the development of new products. Which can create product advantages both in terms of physical quality and promotional aspects to support the achievement of marketing performance.

## Reference

Coyne, K. P. (2005). Sustinaiable Competitive Advantage-What It Is, What It Isn't. *Business Horizons*.

Crawford, C, Merle (2011), *New Product Management*, Homewood, IL , Richard D Irwin.

Faizal, S., & Sudarso, I. (2013, July). Pendekatan Metode Structural Equation Modelling (SEM) Untuk Analisa Persepsi Pegawai Terhadap Gaya Kepemimpinan Di Industri Manufaktur (Studi Kasus PT. Ferro Sidoarjo). In *Prosiding Seminar Nasional Manajemen Teknologi XVIII. Program Studi MMT-ITS, Surabaya* (Vol. 27).

Ferdinand, A. (2005). Structural equation modeling dalam penelitian manajemen: aplikasi model-model rumit dalam penelitian untuk Tesis Magister & Disertasi Doktor. *Language*, *3*(390p), 24cm.

Hamel, Gary dan CK Prahalad (2014), *Competing For The Future*, Boston : Harvard Business School Press.

Haryono, S., & Wardoyo, P. (2012). Structural equation modeling. *Bekasi: PT Intermedia Personalia Utama*.

Jaworski, Barnard dan Ajay K Kohli (2013), *Market Orientation : Antecedents and Consequences*, Journal Of Marketing Vol 57 (July).

Mustafa, M. B., Nordin, M. B., & Razzaq, A. B. A. (2020). Structural Equation Modelling Using AMOS: Confirmatory Factor Analysis for Taskload of Special Education Integration Program Teachers. *Univers. J. Educ. Res*, *8*(1), 127-133.

Sugiono (2011), *Metode Penelitian Bisnis*, Alfabeta, Bandung.

Tiger Li & Roger J Calantone. (2010). *The Impact of Market Knowledge Competence on New Product Advantage, Conceptualization and Empirical Examination*, Journal of Marketing, Vol 62 (October).