

Positioning Analysis for Higher Education Based On Perceptual Mapping Using Multidimensional Scaling

Hafizh Suharja¹, Yati Rohayati², Rio Aurachman³

School of Industrial and System Engineering, Telkom University, Bandung, Indonesia

e-mail : hafizhalmaraghi@students.telkomuniversity.ac.id, yatirohayati@telkomuniversity.ac.id,

rioaurachman@telkomuniversity.ac.id

ABSTRACT

The purpose of this study was to determine the perceptions of prospective students to master degree in the province of DKI Jakarta and West Java based perceptual mapping using multidimensional scaling based attribute. Multidimensional scaling (MDS) is a multivariate technique that uses more than one variable to find out the conditions of competition, advantages, disadvantages and determine the position of each college in the eyes of prospective students based attributes. Attributes that are used in this study is the brand image, facilities, field specialization, career opportunities, quality of education, quickly get job, tuition fee, campus environment, campus location, lecturer, scholarship, fast track and direct track. Masters Programs that will be the case in this study is a master of electrical engineering. Samples from this study are 80 students from bachelor of Electrical Engineering and bachelor of Telecommunication engineering from a well-known private university in Bandung.

Key words: Multidimensional Scaling , Positioning Analysis, Higher Education.

1. INTRODUCTION

1.1. Background

At present, the conditions of competition to get a job is becoming increasingly tight. The quality of prospective job applicants be very aware. Study of master degree is a way to improve the quality of job applicants to increase competitiveness. One of the majors at master degree is Electrical Engineering for individuals who have completed their bachelor majoring in Electrical Engineering and Telecommunications Engineering. One of private university in Bandung providing services master of Electrical Engineering plans to increase the number of students per batch by knowing its position in market based on the perception of prospective students.

So far there are eight universities in DKI Jakarta and West Java that provides master of Electrical Engineering. Colleges provide master of Electrical Engineering is National Institute of Science Technology (ISTN), Bandung Institute of Technology (ITB),

Gunadarma University (UG), University of Indonesia (UI), Indonesian Christian University (UKI), Mercu Buana University (UMB), Trisakti University (Usakti) and one of private university in Bandung.

Positioning is the act of designing the company's offer so that it occupies a distinct and value placed in the mind the target customer (Kotler and Keller, 2006). Positioning analysis is a way for one of the private universities in Bandung can compete and determine competitive advantages over its competitors.

Methods to determine positioning based Kasali (1999) can be done in three ways such as Factor Analysis, Discriminant Analysis and Multidimensional Scaling (MDS). In this study, we review the role of MDS in exploring information related to positioning master of Electrical Engineering from state university, private universities and one of private university in Bandung.

2. THEORETICAL BACKGROUND

Positioning is important for companies in this case universities to explore the perceptions of prospective students and ultimately to improve the image embedded in the minds of prospective students. With so prospective students may be more interested in choosing the college.

Things can be done to strengthen the positioning of the brand, marketers can perform physical positioning and perceptual positioning (Mullins et al, 2008). Physical positioning assess the relative position of the products seen on the product's physical characteristics, whereas perceptual positioning assess the relative position of benefits offered. Which will be used to assess the positioning of this study is the perceptual positioning.

To measure customer perception may use statistical methods or tools exist. There are three methods that can be done in positioning (Kasali, 1999) that is factor analysis, discriminant analysis and multidimensional scaling. The exposure method of positioning can be seen in Table 2. Based on Table 2 the positioning method

to be used in this study is multidimensional scaling.

Multidimensional scaling is a set of procedures to represent the perceptions and preferences of the respondents in the form of geometry map (Malhotra, 2010). In this study, an analysis tool multidimensional scaling (MDS) aims to determine how the positioning master of Electrical Engineering one of private university in Bandung compared to its competitors (obtained from respondents' perception of the sample) by selecting attributes master of Electrical Engineering using a scale of 1 to 5.

MDS consists of two part such as attribute-based MDS and non-attributes- based MDS. Performed on attributes-based MDS are respondents were asked to provide an assessment of the number of brands based on attributes that are provided, while in the non-attribute-based MDS respondents were asked to provide an assessment of the number of brands based on criteria respondents themselves. Based on the exposure to this study will be used is attribute-based MDS that attributes used in assessment of respondents can be known.

Table 1. Methods of positioning

| <i>Items</i> | Discriminant Analysis | Factor Analysis | Multidimensional Scaling |
|-----------------|--|--|---|
| Theory Overview | Classify attributes. | Identifying the structure of relationships between variables. | Mapping the perceptions and preferences of consumers visually in geometry map. |
| Advantages | Taking into account the many attributes and generate a function for forecasting. | Analyze the attributes that objective and subjective. | The position of each brand will be seen clearly as mapped, can find the nearest competitor with brands studied. |
| Disadvantages | It is hard to interpret the position of brands. | High subjectivity in determining the number of factors. | Need to check the relevant object so as not to interfere with the perceptual map. |
| Output | Grouping attributes to be a function of forecasting. | the grouping of factors that can represent the original variables. | Visual representation in the geometry map that describes the position of the brands and attributes. |

3. RESEARCH METHOD

The steps in this research is attributes excavation, data mining college providers master of Electrical Engineering, designing questionnaire, validity test, dissemination questionnaire, reliability test, MDS processing, data analysis.

Attribute excavation conducted based on research of Niculescu (2006) to 16 bachelor students of electrical engineering and telecommunications engineering. Attribute excavations carried out in three stages such as Popularity test, the Rational Analysis of Factor, and the Simulation of the External Influence.

Popularity Phase Test respondents were asked to answer three attributes master of Electrical Engineering elections are out of their minds quickly or spontaneously, from this stage will be generated emotional factors. The second stage is the respondents were asked to mentioning of the three attributes that they think is important when choosing master of Electrical Engineering, from this stage will be generated rational factors. The last stage the respondents were asked to choose four of the 18 attributes of other factors in addition to those mentioned in the previous stage, then four of these factors are external factors.

The results of this study will be recapitulated and searched the dominant factor of each stage is, and then used as input for the preparation of the questionnaire.

Data obtained by digging from Dikti and official website of each college provider master of Electrical Engineering.

The questionnaire was made based on the data attributes and universities obtained from the previous stage. The content of the questionnaire includes the profile of respondents, the demographics of the respondents, the information of each college, and assessment of respondents' perceptions each master of Electrical Engineering based on attributes provided.

Questionnaires have been made subsequently validated by experts in this case is a lecturer. Questions that do not fit then eliminated.

Once the questionnaire is declared valid, then the questionnaire distributed to 80 respondents who are students batch of 2011, 2012 and 2013, from bachelor Electrical Engineering and bachelor Telecommunications Engineering.

Selection is based on the respondents' generation has passed closest time period. For batch of 2013 which is a level 3 remains as respondents because it has the opportunity to complete the study period in 3.5 years. Additionally bachelor Electrical Engineering and Telecommunications Engineering selected as respondents for can continue to pursue master of Electrical Engineering.

Sample technique used in this research is purposive sampling because potential respondents were considered to have the necessary information for research (Sugiono, 2009).

The number of samples is sufficient based from Hair et al (1995) that is five times the number of indicators, indicators or attributes used in this study were 13 attributes so that the minimum sample size was 65 respondents.

After the questionnaires distributed later tested questionnaire data reliability. Based from Hair et al (2010), the data is reliable when it has a Cronbach alpha of at least 0.6, but when the Cronbach alpha generated is in the range 0.4 to 0.6 can still be used.

After the data has been reliable, the data can be processed by MDS existing procedures.

MDS stages of processing consists of six phases, which formulate the problem, obtain data input, select an MDS Procedure, decide on the number of dimension, the dimension label and interpret the configuration, and assess reliability and validity.

In the first stage the problem is formulated in order to get the purpose of processing the MDS.

The second stage of choosing how to obtain input data for MDS, there are three ways namely by direct perception, indirect perception and preferences. Direct perception is the respondent's perception of

the brand based on the criteria of the respondent. Indirect perception respondent's perception of them based on the criteria that have been provided. Preference is based on the assessment of respondents most preferred brand to the least preferred.

The third stage of the selection procedure performed MDS consisting of two part such as non-metric and metric MDS. Non-metric procedure is an ordinal data type as input data but the output later produce the type of metrics data, while the metric procedure is the type of input data and generating interval and ratio metric output.

The fourth stage, the number of dimensions is determined by considerations of existing theories and research from past, the ability to interpret the data in a spatial map, elbow criterion, ease of use and value of stress. The fifth stage, after the resulting spatial or perceptual map existing dimension folder labeled based on the attributes possessed.

The last stage, an assessment of the reliability and validity of the perceptual map is generated by calculating the stress and R-Square. Results of MDS claim to be representative if the Stress values below 5%, and R-Square is more than 0.6.

4. RESULT AND DISCUSSION

4.1 Result

Based on the MDS result generated that the attributes on which to base the selection of prospective students consists of 13 attributes such as brand image, facilities, field specialization, career opportunities, quality of education, quickly get job, tuition fee, campus environment, campus location, lecturer, scholarship, fast track and direct track.

Once processed using methods generated MDS perceptual map as shown in Figure 2. Stress Values for this research data is 0.041, or 4.5% and R-Square of 0.999, so that the perceptual map of this study claim to be representative.

Results perceptual mapping that is analyzed by the Euclidean distance between universities and attributes as well as university and university. The smaller Euclidean distance are more resembles a universities with those attributes, whereas if the Euclidean distance between university and university the smaller, the universities have been the closest competitor.

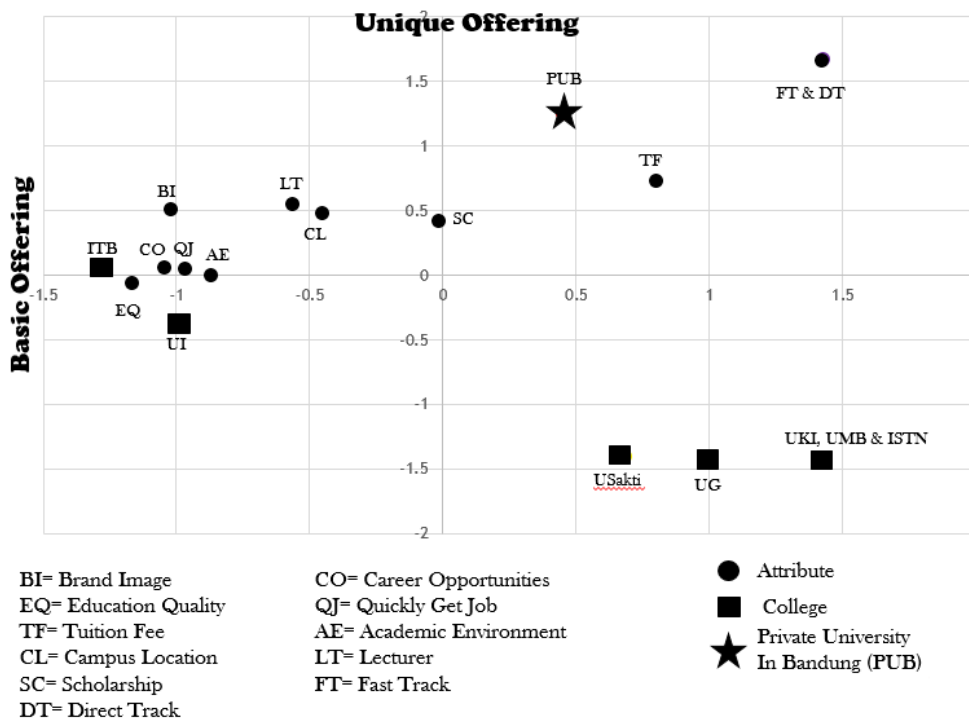


Figure 1. Perceptual Mapping Master of Electrical Engineering

4.2 Discussion

Universities that provides master of Electrical Engineering consists of three parts such as state universities, private universities and one of private university in Bandung.

a. State universities such as ITB and UI has advantages on the attributes of brand image, quality of education, career opportunities, field specialization, quickly get job, campus environment, campus location, lecturer and facilities.

b. Private colleges such as UG, UKI, UMB and ISTN has advantages on the attributes of scholarship and tuition fee.

c. And one of private university in Bandung has advantages on the attributes of scholarship, tuition fee, fast track and direct track.

5. CONCLUSION

In this study, resulted perceptual mapping with master of Electrical Engineering one of private university in Bandung has advantages over the attributes of tuition fee, scholarships, fast track and direct track. While the rest is a weakness that must be improve by one private university in Bandung in order to compete against its competitors.

The closest competitor one private university in Bandung is ITB. ITB has the advantage attribute of brand image, facilities, career opportunities, Quality of education, quickly get job, campus location and lecturer. Therefore, the attributes that are the hallmark ITB could be an improvement for one of the universities in Bandung in order to get more attract prospective students.

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AUTHOR BIOGRAPHIES

Hafizh Muhammad Almaraghi Suharja is a student in Industrial Engineering, Faculty of Industrial and System Engineering, Telkom University, Bandung. His specialization for final task is marketing research. His research interests are in the area of Marketing, Product Development and Public Relation. He is a member of the Marketing Professionalism, as former President.

Yati Rohayati is senior lecturer in Industrial Engineering, School of Industrial and System Engineering, Telkom University, Bandung. She received her Doctoral of Marketing from Indonesia University 2006. Her research interests are in the area of Quality Management, Service Operation Management and Marketing.

Rio Aurachman is a lecturer in Industrial Engineering, School of Industrial and System Engineering, Telkom University, Bandung. He received his Master of Industrial Engineering from Institute Technology Bandung in 2012. His research interests are in the area of Business Process Engineering, System Modelling and Operational Research.