

MARKETING RISK MANAGEMENT OF POTATO CHIPS BY FUZZY MULTI-CRITERIA MULTI PERSON DECISION MAKING APPROACH IN SMALL MEDIUM ENTERPRISES (SMEs)

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ABSTRACT

This paper studied to analyze marketing risk of potato chips and to determine alternative priority on marketing strategy of potato chips. The methodology used Fuzzy Non Numeric Multi Criteria Decision Making (MCDM) and Analytical Hierarchy Process. This research used 5 experts are three owns SMEs of potato chips, one academy (marketing strategies lecturer) and one expert of risk marketing management. Based on the result, the marketing risk of potato chips by using Fuzzy MCDM is moderate. Risk factors of product, promotion, and distribution variables are very high, high, and moderate respectively. The most affecting variable of marketing risk management of potato chips is distribution (46%). Prior purpose of marketing risk management is to increase image and bargaining power of product. Whereas prior of marketing strategy is to minimize manifestation of risk on Small Medium Enterprises. by developing product diversification (29%), maintenance and development of new market segments 28%, addition of distribution paths (21%), implementation of technology (13%), and extension of promotion media (9%).

Keyword: *risk management, MCDM, AHP.*

INTRODUCTION

Agroindustry development has strategic meaning because during 1997-2006 the number of SMEs reached 99%. SMEs have an important contribution to the economy by contributing to gross domestic product and employment [1]. Agroindustry development also occurred in Batu City, growth in the potato processing business unit grew from 14 units to 28 units [2]. Fajar Mulya, Rimbaku, and Agronas Nutrition Food is some of SMEs in Batu City which markets potato crackers that can be seen from the increasing sales volume e.g. in Fajar Mulya potato crackers, total sales for 2006-2008 show 40.320 kg up to 51.840 kg. The sales increase is due to the large market opportunity and offset by intends competition. The high level of competition requires UKM to have the right strategy in achieving its goal of increasing sales and profits.

Marketing strategies that have been done three SMEs include diversification of the population, the application of technology, maintaining and developing new market segments, adding distribution channels, and expand promotion. strategy media has not been optimally implemented to achieve marketing goals so that the necessary improvement of marketing strategies with marketing approaches mix. The determination of marketing strategies needs to be prudent because it has a risk that needs to be management. One of method that can be used is the Fuzzy Multi-Criteria Decision Multi-

Person Making. According to Carlson and Fuller [3].ME-Fuzzy MCDM method is a suitable method used to define some criteria for the selected alternative with some approach taken by decision-makers (experts). Tjsao [4] adds that this method can help determining the ranking of alternatives based on benefit issues, cost or balance-ME nature. Method of Fuzzy MCDM is a method that accordance with the above problems because of the risk management, information or data of existing data often contains uncertainties and inconsistencies.

MATERIALS AND METHODS

This research used Fuzzy Multi-Criteria Decision Multi-Person Making and Analytical Hierarchy Process by purposive *sampling* technique. The population is expert of potato chips consist of marketing, producer and strategy management fields. The analysis of data use MCDM and AHP are divided by:

A. **Identification of Variable** that used product consist of (quality of crackers, various of taste and weight in package) the objective and strategy for risk management consist of

1. Destination marketing risk management development is

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- a. Enhancing the image and competitiveness of products
- b. Improving customer satisfaction
- c. Increasing the volume and value sales
2. Marketing strategies to minimize risks, among others

B. Fuzzy Multi-Criteria Decision Multi-Person Making (MCDM)

1. Calculate the value of the interests of the criteria, values and level of risk

Table 2 Assessment Scale

| Grading Scale | Negation |
|----------------|----------------|
| Very Low = S1 | Very High = S5 |
| Low = S2 | High = S4 |
| Medium = S3 | Medium = S3 |
| High = S4 | Low = S2 |
| Very High = S5 | Very Low = S1 |

2. Calculating the value of the aggregation criteria of assessors: $Pik = \text{Min} [Neg \text{ l } (qi) \vee Pik (qi)]$:

Pik: the aggregation criteria of appraisal

l: the importance of criteria

Neg (li): $LQ - l + 1$

Pik (qi): the value of the opinions of assessors

3. Weighting factor determining the value of decision makers:

$QA (k) = Sb (k)$

$b (k) = \text{Int} [1 + k * (q-1) / r]$

Description:

QA (k): weighted average of rater on a scale k

q: number of scales of assessment

r: number of assessors

4. Determining the combined value of all experts by the method of OWA (Ordered Weighted Average):

$P = \max \dots j. r [QJ \wedge Bj]$

Pi: the aggregation of assessment

QJ: weight assessment group

Bj: sorting values from large to small

C. Analytical Hierarchy Process

1. Formulating the problem by compiling hierarchy. Hierarchy structure in this study can be seen in Figure 1

2. Preparing a matrix of individual opinion of each expert (A)

3. Developing a joint opinion matrix (G) of each expert

GiJ: geometric average of i-th criterion

aij: matrix elements of individual opinion

i: 1,2,..., n

m: number of elements

4. Determining the maximum eigenvalue for each criterion with the formulation:

$Vai = aij \times VP$

$VBI = VA / VP$

5. Consistency calculation:

$\wedge \text{max}$ = maximum eigenvalue

n = size of the matrix

CR = Consistency Ratio

CI = Consistency Index

RI = Ratio Index

6. Entering weight into weight alternative destination, then multiplying. The result of multiplication is the value of alternative weights based on the objectives, as well as on the objectives for each strategy

7. Summarizing the total weight of alternative

RESULTS AND DISCUSSION

Consumer satisfaction is one important indicator for increased competitive advantage for the industry so that the need for design and performance evaluation consumers [5]. Based on the aggregation of expert with the ME-MCDM fuzzy obtained that the risk level of marketing of crackers potato is a "medium" Because SMEs had anticipated likelihood of risk and manage these risks to minimize losses. For example "Fajar Mulya" able to get around the failure products with innovations Moreover, because the potato crackers is a product of processed snack relatively new potatoes if compared with the refined products potatoes such as potato chips and fries, and also when compared with the kinds of crackers which has been widely circulated in the market, so that consumers are less so familiar with potato crackers. Promotion of SMEs does not too heavily because some of the constraints experienced by SMEs. This makes risk management potato crackers gain value "Medium".

The results showed aggregation expert products have a level of risk are "very high ". Product risks that could occur on potato crackers, among others, risks decline in production and risk decrease in the product or Net income of the business. Risk decline in production can be caused influence of weather changes and engine damage. risk reduction in value occurs because of a decrease quality (ready to eat potato crackers are not durable, easy to rancidity, easily crushed, sometimes the color of burnt, and crunchy texture sometimes not), change price-induced changes preferences, tastes and appetites. Different consumers (taste and weight in the pack), hanged supply conditions (availability of materials raw), or changes in conditions economy in general. Risk makes the product has level of risk "very high". Marketing and innovation is seen as a driver of economic growth and a major component of competitive advantage (Lukas and Ferrell, 2000 in [6]).

The results of the analysis on the priority of alternative marketing strategies by the AHP technique derived from the value of priority between components at

each level of hierarchy that shows the order of priority variables, objectives and risk management strategies in potato crackers marketing strategy. The priority value

alternative variables of marketing risks, objectives and risk management strategies in marketing strategy can be seen in Figure 1 below.

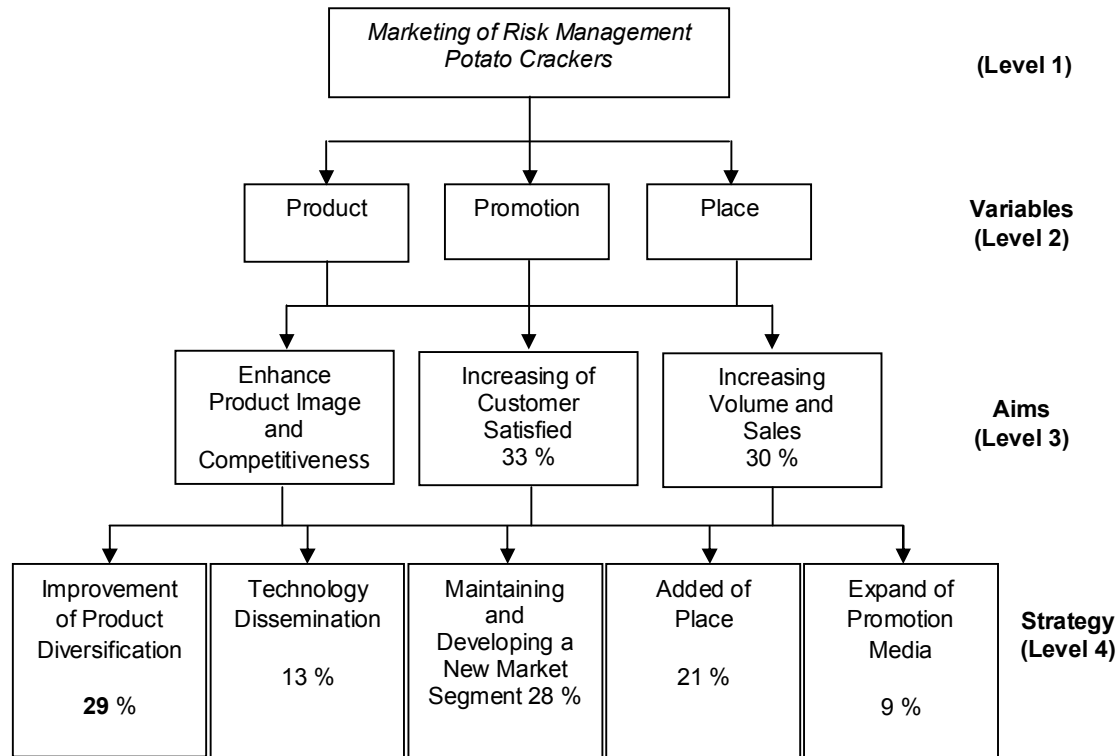


Figure 1. Hierarchy Process Risk Management Marketing Crackers Potato

Place is the highest priority because it is a potato crackers and snack products, including items needed at certain times only. The product has a weight distribution because of differences under the SME focus on the products produced, so there are several factors that are not too prioritized product in marketing, but it still gets attention from the owner. These results are not much different when viewed in terms of risk management which mentions that the product has the highest risk of "very high". Promotion has the lowest priority because it did not do the promotion of SMEs in particular; they feel they are doing promotion (mouth to mouth) it is considered effective enough to attract consumers. The inability of SMEs to meet consumer demand because of the limitations of technology and production sites and a lack of funds for promotion is other factors that become obstacles in the promotion of SMEs.

The priority value indicates marketing purposes that enhance the image and competitiveness of products 37%, improve customer satisfaction 33%, and increase the volume and value sales of 30%. Consistency ratio

(CR) for each destination marketing risks was high if the terms of the product of 0.01372, 0.07441 promotions, and distribution of 0.5436. From these results the respondents are consistent in doing the assessment so it is not necessary revisions. Risk management objectives of the Three SME marketing today are to increase customer satisfaction. Enhance the image and competitiveness of the highest score. Image and a good product competitiveness of SMEs is an advantage that could affect the level of consumer satisfaction, and will automatically increase the value of sales. Image formation and competitiveness of products made since the beginning of the potato crackers are produced and continue to be maintained up to now mainly in maintaining the quality, respond to consumer needs and promote and maintain the other advantages offered by SMEs. The establishment of brand image and is now a pleasant consumer experience with the product, the value that is formed from the media campaign is the company's main active to be maintained [7].

The priority value indicates a marketing strategy, product diversification strategy and develops a strategy to maintain and develop new market segments to obtain the weight of 29% and 28%, the strategy to add distribution channels and strategic application of technology to get the weight of 21% and 13%, while the expanding media promotion strategies have weights 9%. Consistency ratio (CR) for each marketing strategy in terms of the purpose of improving the image and competitiveness of products of 0.05881, from 0.08354 for consumer satisfaction, and the sales volume and value of 0.0040, this indicates that the respondents are consistent in assessment so it is not necessary revisions.

Develop a marketing strategy of product diversification have the highest priority because it is a form of innovation in business management which is one of the basic capital. Current knowledge of potato crackers creativity has not been developed further (limited to a variation of skills and a sense of weight variation in the packaging). Develop a strategy of product diversification is deemed appropriate to meet the goal of improving the image and competitiveness. SMEs Mulya Dawn has done such a strategy, so Dawn Mulya able to reduce the risk of product failure. The hope of this strategy becomes a major consideration when doing repairs marketing strategies for SMEs others. Consumer satisfaction can be changed from time to time so the company needs to conduct an evaluation before or after the purchase continues. It is necessary to attempt to maintain customer satisfaction as an important part of the company as a dynamic phenomenon [8].

CONCLUSIONS

The results of risk analysis marketing potato crackers with Non-Numeric methods of the Fuzzy Multi-criteria Decision Making Multi-person are moderate. Risk level of each variable product, promotion, and distribution is very high, high, and medium. The most influential variables of the marketing risk management are the distribution of potato crackers (46%). Priority objective of the marketing risk management is improving the image and competitiveness of the product (37%). While the priority of marketing strategies are to minimize the risk in potato crackers SMEs Dawn Mulya, Rimbaku Agronas Nutrition and Food is to develop a product diversification (29%), maintaining and developing new market segments (28%), increasing distribution channels (21%), the application technology (13%), and expanded media campaign (9%).

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