The Use of Fuzzy Logic in Developing Competitiveness Strategy Toward Small and Medium Enterprises (Grocery)

Arasy Alimudin[1,*], Soebandi[1], Achmad Zakki Falani[2], Eman Setiawan[3], and Bustomi Arifin[3]

[1]*Department of Management, Narotama University of Surabaya, Indonesia*
[2]*Department of Informatics Engineering, Narotama University of Surabaya, Indonesia*
[3]*Department of Education, Narotama University of Surabaya, Indonesia*

Lack of professionalism in management system can be viewed as a negative factor for most groceries stores in Indonesia. It happens because their management background in managing the trade is still using network and kinship. Furthermore, lack of professionalism can be determined as the main weakness of groceries in facing AEC 2015, since 2015 ASEAN will be the only market that is supported by free goods, services, investments, capitals, and skilled worker. This condition is worsened by unhealthy competition between groceries and modern mini-market coupled with hypermart. In order to be able to compete with those stores, grocery needs to develop their system and managerial pattern. In other words, they need to develop their system from traditional into professional (equipped with legal aspect and utilizing modern technology). Changing direction from network and kinship into the professional system means that groceries need to be more focus on creating unique characteristics and professional competitiveness. It can be shown by changing lazy coupled with easy to give up attitude into high discipline and unyielding attitude. All efforts mentioned above need to be collected in a container in order to create synergy and compact advantage. The present study aims to identify competitiveness of Indonesian groceries in facing AEC. The present research uses expert analysis in form of Fuzzy Logic system which utilizes SWOT analysis in analyzing the competitiveness of Indonesian groceries in facing AEC. Internal issues coupled with external factors that are possessed by the groceries will be elaborated further in the present research. Expert analysis taken from Fuzzy Logic system is projected to help groceries in making strategic competitiveness decision to compete within AEC. Based on SWOT and cross tabulation analysis, it shows that implementation of information system concerning competitiveness of groceries has concrete relation toward efficiency of the business process and trading productivity since groceries are helped in making a decision and applying the system even those groceries do not have good managerial background.

Keywords: Competitiveness Strategy, Small and Medium Enterprises, Fuzzy Logic, Managerial.

1. INTRODUCTION

Small and medium enterprises nowadays are facing a tough situation which leads to uneven competition. It is uneven because there are numerous medium coupled with high enterprises are entering market segments of small enterprises in conducting business. The present phenomenon is shown by the establishment of numerous franchise minimart coupled with hypermart in East Java, mainly in Surabaya. Criteria of Small and Medium Enterprises (UMKM) based on The Constitution No 20 2008 is based on their revenue and asset.

During this time, small and medium enterprises are highest labor market in East Java mainly in Surabaya. Moreover, small and medium enterprises are the main solution in decreasing unemployment rate since development within industrial sector is not steady or in other words, it tends to decrease. But unfortunately, small and medium enterprises are not ready to face ASEAN Economic Community (AEC) which is started since December 2015. According to East Java Governor, East Java has around 6.8 million small and medium enterprises which approximately around 4 thousand who are ready to face AEC, 70 thousand are under special supervision in order to be ready to face AEC. It can be said that around 6.7 million small and medium enterprises in East Java are not ready in joining AEC. In order to deal with this condition, the local government needs to cooperate with small and medium entrepreneur coupled with universities in order to form a partnership through supervision program.[1] Table I lists some criteria of small and medium enterprises.

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*Author to whom correspondence should be addressed.

Table I. Small and medium enterprises criteria (UMKM)* in million Indonesian rupiah.

No	Business	Criteria	
		Asset*	Revenue*
1	Micro business	Max 50 million	Max 300 million
2	Small business	>50–500 million	>300 million–2.5 billion
3	Medium business	>500 million–10 billion	>2.5 billion–50 billion

Source: Ministry of Cooperation and Small and Medium Enterprises (Kementerian Koperasi dan Usaha Kecil Menengah), 2012.

Based on Indonesian national dictionary that is published by The Language Center of National Education Ministry, the term grocery is a store which consists of a permanent building that sells goods (snacks, dairy product etc.). Meanwhile, grocery can be determined as
1. A tool uses by seller to attract buyer
2. Goods for daily use for example soap, toothbrush, etc. (http://badanbahasa.kemdikbud.go.id).

Therefore it can be said that the definition of a grocery store is a permanent store which sells goods for daily use in which it is located nearby the buyer house coupled with attractive seller attention. Competitiveness development of grocery store becomes an urgent demand which needs to be prepared in order to face ASEAN Economic Community (AEC) which is started since December 2015. Based on data taken from BPS East Java Region, the number of franchise minimarket in east java in 2011 around 1,448 meanwhile in 2014 around 2,304 in which the growing average is around 59%. Moreover, it is recorded that east java has around 8387 groceries in 2011; meanwhile, in 2014, it becomes 8393 in which the growing average is around 0.7%.[1]

According to the data mentioned above, small enterprises comparative advantage is not enough to compete within the market since it also needs a sustainable competitive advantage. Small enterprises are demanded to produce high quality products which have high competitiveness to compete in numerous market such as minimarket, supermarket, and hypermarket. Furthermore, competitiveness values that are mentioned above can be described as:
(1) Ensuring supply chain in order to maintain regular coupled with continuous supply,
(2) Providing high quality products which have reasonable price for the market,
(3) Producing product variations which are suitable with the market needs and demands.

Expert analysis using Fuzzy Logic that is elaborated in the present study aims to help groceries in establishing competitiveness strategy to facilitate them to develop their business.

1.1. Developing Competitiveness Concept

Porter argues that competition play significance role for the success or failure of a firm since it is the core which decides whether a firm will be succeeded or failed.[2] Competition stimulates two sides which are successful and failure sides. Successful side is seen as motivation which encourages firms to be more dynamic and compete in generating products coupled with providing best service for market. Meanwhile in failure side, competition can be viewed as weakness point for firms who have static improvement because they are fear to compete couple with discourage to
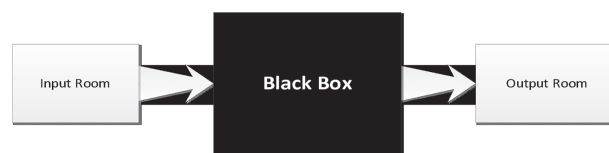

Fig. 1. Input–output mapping in fuzzy logic.

generate best products. Therefore competition for these firms is seen as a threat.

Porter views that eminence within competition can be achieved when we able to implement the creation of values rather than the implementation of simultaneous potential competitor toward superior execution or similar strategic that is used by a competitor or in other words by adopting competitor behavior in order to develop business or to compete with other competitors.[2] Although small firm does not providing network and big profit for its employee, for some people, it is believed that there are some satisfactions when they work in a small firm. By working in a small firm, they able to view the firm target, direction coupled with orientation. Short and direct communications that are built in the small firm contain dedication and concern of its employee. Employees are trained to do various tasks coupled with stimulated by rewards to encourage their loyalty toward the firm. Therefore, existence of entrepreneur and small firm in regard to product development play essential role.[3]

Competitive eminence has two meanings which are connected each other in which first meaning is focused on superior skill, and/or superior resources.[4] The second meaning is connected with firm positional excellent which is shown by superior performance outcomes.[4] Things that can be regarded as resources are skill, process, organization, attribute, information, all knowledge which are managed by firm which can be used to maintain coupled with implement strategy in order to increase efficiency and effectiveness.[5] A firm which has superior skill will be able to produce better information regarding customer needs and demands. This firm is also able to establish and market goods or services through an excellent coordination. Moreover, superior skill has function as a tool to create an action in establishing excellent competitiveness based on knowledge about competitor action and reaction.[6]

Strategic assets can be defined as a set of resources and competencies that are used by firm as competitive eminence which cannot be traded, adopted because it is rare, founded since it is unique and special.[7] Competitiveness dimension of a firm consist of cost, quality, delivery punctuation coupled
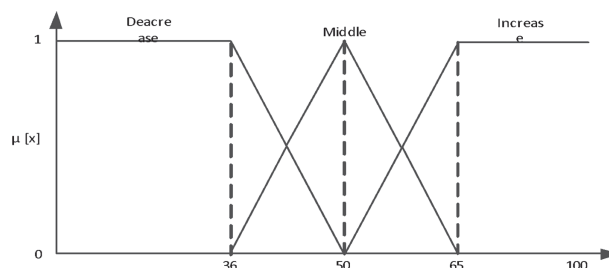

Fig. 2. Repository fuzzy of groceries competitiveness as the variable.

Table II. Research about small trading enterprises competitiveness.

No	Researcher name	Research title	Method	Result
1	Iffah, Sutikno dan Sari (2011)	Influence of modern store toward small store enterprises: Minimarket location in Blimbing district Malang	Importance performance analysis (IPA) cross tabulation, minimarket influence analysis, service overlay range analysis.	Service range influences development of small stores. In other words wide range services of minimarket influence the development of small store. Average friction around 57,29% or one minimarket influences 4 stores
2	Pardiana Wijayanti (2011)	Analysis of traditional store revenue changing influenced by minimarket (case study in Pendurungan district Semarang)	Ordinary least square	1. High number of minimarket accretion stimulates revenue changing of traditional store 2. Short distance (1 meter) between minimarket and traditional store stimulates reduction of traditional store revenue around 0,02%
3	Arasy Alimudin (2013)	The influence of entrepreneur orientation to sustainability competitive advantage and increase performance marketing of commercial sector small industry in Surabaya town	Cross tabulation analysis, path analysis	Entrepreneur orientation is occupying strategic position in developing continuous eminence competitiveness of small enterprises related to consumer goods in Surabaya, therefore entrepreneurs need to be more commitment toward innovation, proactive dare to take and manage risks.
4	Jaziela Muslihatunnisa (2014)	The impact of mini market franchise toward groceries in Pacitan district, Pacitan East Java.	Descriptive analysis	Groceries largely (71,8%) experience negative impact of minimarket franchise occurrence in form of revenue reduction, consumer reduction, etc.

with flexibility.[8] Besides, location of a business has significance impact toward cost of production, product or service price and firm competitiveness.[9] High or reasonable price of a product can be used to increase couple with determine marketing performance.[10] Furthermore, location of a firm also influences dimensions of marketing performance strategy such as flexibility, competitive positioning, management demand and focus strategic.[11]

Efforts to achieve competitiveness eminence can be done by improving relation with customer that can be measured based on:
a. Customer Value
Customer value is a difference between customer total value and customer total cost coupled with customer total cost toward market bargaining (customer revenue)
b. Customer Satisfaction
Customer satisfaction can be measured according to performance that is given by a product because when the product able to fulfill the customer expectation, customer satisfaction can be acquired.[12]

World Economic Forum[13] describes that there are two business factors which influence competitiveness product which are inflation with average number around 6.1 and taxes with average number around 4.2.

Table II shows research about competitiveness of groceries within 5 years ago.

1.2. Fuzzy Logic System Approach in Making Strategic Decision to Develop Competitiveness

Fuzzy logic is component form of soft computing which is introduced by Prof. Lotfi A. Zadeh in 1965. Basic foundation of fuzzy logic is repository of fuzzy theory. In this theory, the function of membership degree as determiner of element presence within repository is important. Membership degree value or membership function becomes the main characteristic of fuzzy logic reasoning.[14]

There are numerous reasons why fuzzy logic is applied to solve various problems mainly as supporting system in making decision which are:
1. Fuzzy logic concept is easy to understand since it is using repository theory which is applying mathematic concept therefore it can be comprehended easily.
2. Fuzzy logic is flexible which means it can adapt with changes and uncertainty which follow the problems.
3. Fuzzy logic contains tolerance toward data which is not valid. In other words, if there are groups of homogenous data which also contain various exclusive data, fuzzy logic has ability to tolerate with those exclusive data.
4. Fuzzy logic is able to model non-linear functions which are complex and complicated.
5. Fuzzy logic is able to establish and apply professional experiences directly without passing through a training process. It is known as Fuzzy expert system.
6. Fuzzy logic is able to cooperate well with control technics in a conventional way.
7. Fuzzy logic is easy to understand since it uses natural language.

Numerous keys that need to be known in understanding fuzzy system are:
a. Variable fuzzy
Variable fuzzy is a variable which will be discussed within a fuzzy system.
b. Repository fuzzy
Repository fuzzy is a group which represents a condition or certain situation within a variable fuzzy. As an example, in categorizing net profit margin value or profit margin or firm net income (in billion rupiah) into a repository: it can be represent by DOWN, MEDIUM, and RISE graphic.
c. Institutional Repository
Institutional repository is an overall value which is allowed to be operated within variable fuzzy. Institutional repository is a real numeral repository that commonly increases from left to
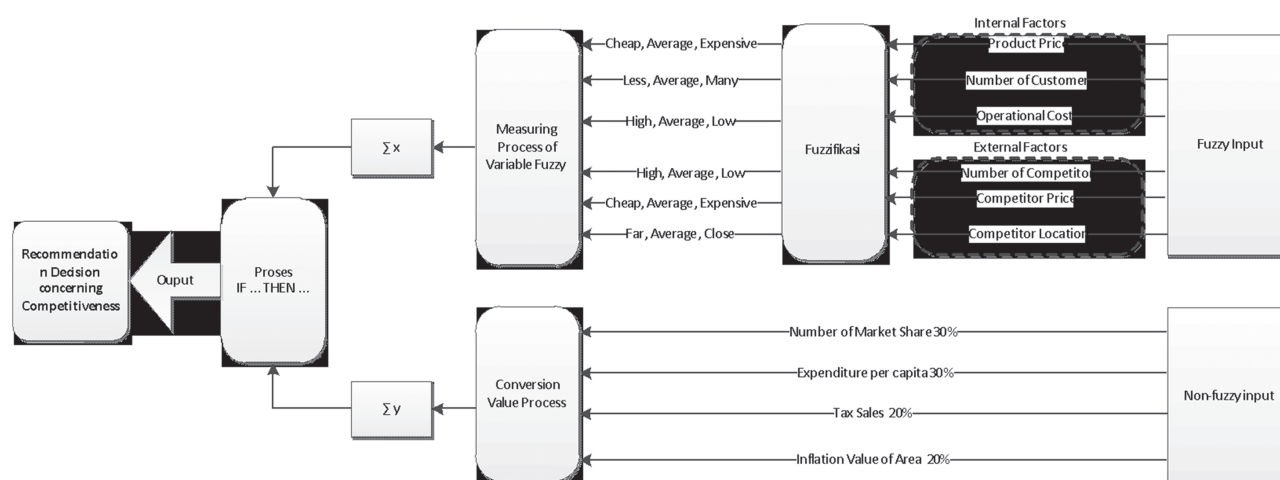
Fig. 3. Architecture system.

right. Institutional repository value can be in form of positive or negative number. Sometimes institutional repository value is not limited by boundary upon them.

d. Domain

Repository domain fuzzy is an overall value that is allowed within the institutional repository and it can be operated within repository fuzzy. Same like institutional repository, domain is a real numeral repository which commonly increases from left to right. Domain value can be in form of positive or negative number.

Commonly, an expert has knowledge regarding the procedure of fuzzy system which can be stated in a set of IF–THEN rule. By conducting fuzzy inference, expert knowledge can be transferred into software which will be used to map input to output based on IF–THEN rule that is given. Fuzzy system that is generated by this system is called Fuzzy Inference System (FIS). FIS has been applied to various sectors which one of the sectors is an expert system.[15]

2. METHODOLOGY
2.1. Research Stages
Research stages are started by examining references to researches and official documents concerning small and medium enterprises mainly groceries in commerce sector. The next stage is by conducting survey and questioner to collect data. Later on, the data is analyzed coupled with categorized into three sections which are: discount off the competitor product, a portfolio of small and medium enterprises in commerce sector, analysis of market and consumer. SWOT and Cross tabulation are used as the approach in analyzing the data in order to determine the connection between groceries factor and positioning. Competitiveness architecture design of Small and Medium Enterprises mainly groceries is made based on the data that are collected by defining:
1. Grocery internal factor analysis (micro).
2. Grocery external factor analysis (macro).
3. Independent variables as the part of external factor which do not have influence toward other will be included in non-Fuzzy input.

4. Data sample that will be used in the present study is based on case study.
5. Fuzzy logic system that is elaborated further in the present study will be dedicated to groceries in order to determine whether competitiveness strategy that is seen by the consumer will be based on price competition or quality/uniqueness competition.
6. The fuzzy output that is resulted in the present study will be in form of recommendation for groceries in determining competitiveness strategy to increase revenue. Moreover, the fuzzy output will be used to examine whether the grocery has competitiveness above the average or not.

2.2. Population and Sample
The present study uses microfinance groceries as the sample and population. According to Economic Ministry Decree No. 40/KMK.06/2003, 29 January 2003,[16] microfinance grocery is a productive business that owned by Indonesian private or family which has circulation sales maximum Rp. 100,000,000,00 (one hundred millions) each year.

Respondent Characteristics for the survey are:
(a) Groceries in Surabaya and the surrounding.
(b) Grocery owner or caretaker
(c) Not less than 17 years old and not more than 60 years old
(d) Have already doing grocery business at least 1 year.

2.3. Data Collection Technique
Data collection in the present study uses two stages which are primary data and secondary data which will be described below:
1. Primary data collection is taken directly from respondent through a questionnaire.
2. Secondary data collection is taken by examining firm's report, literature, online periodical journals that are published by a corporation, government department, bulletin, various reports that are published by the official department.

2.4. Data Analysis Technique
Cross tabulation analysis through is conducted in order to determine the relation between research construction and respondent characteristics.[17] Meanwhile, competition analysis will be

analyzed using SWOT. Competition analysis is elaborated by identifying threat, opportunity, or strategy question that occur as an impact of potential competition changes, also competitor strength coupled with weakness. Cravens stated that competitor analysis can be defined as competition field, strategic group analysis, image and evaluation of main competitor. Analysis mentioned above should able to show competitor strength and weakness. SWOT analysis is a mapping of weaknesses and strengths of an organization coupled with opportunities and threats that can be occurred nearby the organization.[18]

Logistic regression is an approach in modeling prediction such as linear regression or Ordinary Least Squares (OLS) regression. The main difference between logistic regression and ordinary least squares is when researcher predicts bound variable which has dichotomy scale. Dichotomy scale means a scale which consists of two categories such as yes and no, good and bad, high and low.

3. RESULTS AND DISCUSSION

Based on literature reviews and survey, it can be seen that competitiveness groceries are influenced by price, quality, location and flexibility. This condition is same like research that is conducted by Ward et al.[8] showed that competitiveness dimension of a firm consists of cost, quality, delivery order, and flexibility. Moreover, study conducted by Krajewski[9] stated that business location plays important role toward operation cost of a firm, product and service price and influence firm competitiveness. Nearly the same like other studies[10] stated that reasonable price stimulates marketing performance. Location also plays essential role toward dimensions of strategic marketing such as flexibility, competitive positioning, management demand, and strategic focus.[11] Achievement of eminence in competition can be achieved by establishing relation with consumer which based on:
a. Consumer value

Customer value is a difference between customer total value and customer total cost coupled with customer total cost toward market bargaining (customer revenue)
b. Consumer satisfaction

Customer satisfaction can be measured according to performance that is given by a product. When the products are suitable with customer expectation, therefore, customer satisfaction can be acquired.[12]

According to World Economic Forum,[13] global competition contexts are influenced by two main aspects which are inflation with an average rate around 6.1 coupled with tax with an average rate around. Factors that form competitive positioning mentioned above need to be anticipated mainly for commerce small and medium enterprises by producing an accurate strategic plan. One of the successful keys in determining accurate strategic plan is concerning market selection and determining a strategy to compete within competition.[19] Porter[2] stated that competitiveness eminence can be achieved through various strategies such as business strategy which consists of cost leadership, differentiation and focus. Continuous competitiveness eminence can be achieved when the management has the ability to create and implement resistant strategy toward imitation competition and able to establish long-term competition.[20–23] Moreover, environment factor also play an important role toward business condition since this factor able to determine what kind strategy that

can be applied. A good way to formulate an effective and efficient strategy is by combining internal and external organization point of view.[24–26] Results that are taken from studies mentioned above can be used as guidance in establishing groceries competitiveness in global competition. Nowadays, competition only happens at one level but it develops into multilevel competition level. It can be seen that service range of minimarket influences the development of groceries. One minimarket influences 4 groceries revenue which is shown by decreasing revenue with average friction around 57, 29%.[27] Furthermore, next study shows that high revenue that is achieved by minimarket influences the decreasing revenue of groceries and minimarket position which is 1 meter from groceries also influences the decreasing revenue of groceries around 0, 02%.[28] Strategic position based on a study that is conducted by Arasy[29] stated that entrepreneur orientation ranks in a strategic position in developing sustainability of small consumer goods in Surabaya. Consumer goods owner needs to make commitment concerning innovation, proactive, courageous in managing and taking risks. Jaziela[30] in its study stated that 71, 8% groceries are experiencing negative impact by the occurrence of minimarket franchise in form of revenue and consumer decreasing.

Indicators which can be formulated based on studies mentioned above are:
(1) Internal Analysis Factors (micro) that can be used are financial report, groceries sales report, selling price, a number of consumers, and groceries operational cost.
(2) External Analysis Factors (macro) which can be used are:
   (a) Competitor numbers
   (b) Competitor prices mainly special competitor such as Indomart and Alfamart
   (c) Location distance with minimarket.

(3) External factors (macro) are independent variables which are not influencing one toward another can be determined by non-Fuzzy input such as a number of market share and demand. Market share and demand can be measured based on expenditure level per capita and inflation rate. Each factor which is influencing tax level market development value has a different impact toward the development of grocery.

The next step is distributing questionnaire by applying likert scale 1–4 that distributed into grocery respondents. Collected data is examined using cross tabulation analysis coupled with SWOT analysis. The result of data analysis mentioned above can be seen in Table III.

According to crosstab construct analysis result of internal and external competitiveness environment indicators, it is showed that all indicators have a value below 0.005. In other words, it can be said that all constructs have tight relation with competitiveness construct.

Grocery is a small commerce sector which can be used as infrastructure in planning business and positioning its competitiveness since commerce growth is firmly steady. It is matching with the statement of Bracker et al.[31] which stated that established planning will be beneficial for small firm within dynamic industry that developed rapidly.

In order to make quick decision, we need computer to accelerate drafting proses in making business strategic plan. Therefore in performing our language into formulation which can be applied by computer, the present study enhances Fuzzy logic approach or multivalued logic that enable "somewhat" high "very" fast to be

Table III. *Cross tabulation* of internal and external environmental construct with competitiveness as the variable.

Construct	Variable	Significance	Description
Internal environment	Product price	0,00	Significant
	Consumer number	0,00	Significant
	production cost	0,00	Significant
External environment	Competitor number	0,00	Significant
	Competitor price	0,00	Significant
	Distance location of competitor	0,00	Significant
Non-fuzzy external environment	Market share	0,018	Significant
	Expenditure per capita	0,001	Significant
	Area inflation	0,002	Significant
	Taxes	0,001	Significant

Source: Primary data analyzed in 2016.

calculated. Fuzzy logic is an essential tool in making computer to perform like a human.[15] Based upon all mentioned above, therefore grocery competitiveness positioning in the present study uses Fuzzy logic. The input of Fuzzy logic will be divided into two sections which are fuzzy and non-fuzzy.

1. Fuzzy input consists of:
   a. Product price, the number of consumers, operational/production cost, and grocery operational cost.
   b. Competitor number, Prices that are stipulated by competitor mainly indomaret and alfamart, location/distance of competitor in which final conclusion of fuzzy input are high, medium and low competitiveness ability.

2. Input Non-Fuzzy
   a. Non-fuzzy input consists of market share number and market demand which are based on expenditure per capita level.
   b. Inflation level in Surabaya
   c. Taxes rate which influences market growth of groceries.

3. Output Fuzzy

Output Fuzzy that resulted is in form of supporting recommendation decision concerning strategic groceries competitiveness in determining product price and developing consumer trust toward capacity enhancement coupled with product varieties, also the determination of selling price and revenue. Moreover, output fuzzy also determines whether the product has competitiveness value above the rate or not.

The present study stimulates architecture system mentioned above in which there is two variable input named fuzzy and non-fuzzy input. Fuzzy input is a combination of internal coupled with external factors which influence the competitiveness of micro and small commerce sector. The result of the fuzzy process toward fuzzy input variable will be weighted by domain expert where each weight will be added in order to get Σx (sigma 'X') value. Meanwhile, the non-fuzzy input will be counted using value conversion with a different percentage value. The result will be added in order to get Σy (sigma 'Y'). Output process will be achieved through the result of Σx which will be compared using 'IF THEN ELSE' function toward Σy value under condition as follow: when value of $\Sigma x > \Sigma y$ it can be said that recommendation concerning competitiveness decision is about service and quality, if the value of $\Sigma x < \Sigma y$, therefore, the recommendation output concerning competitiveness decision is regarding product price, furthermore, when the value of $\Sigma x = \Sigma y$ it can be said that the recommendation output concerning competitiveness

decision is about other segments that need to be focused on. For more detail, every sub-chapter will be explained below.

3.1. Fuzzy Input

Fuzzy logic is a method which can be used in making decision process to solve problems. The present fuzzy logic technic can be used when insecurity is founded and followed within the data information system as result of data management or in other words input variable contain bias/ambiguous value. Input value quantity that becomes operational function using binary value 1 and 0, meanwhile in fuzzy logic operational value is among 0 to 1. Thus input value of fuzzy logic 0, 1 or 0, 2 and 0, 3 and so on. It is commonly known that fuzzy system is appropriate to make short logic approach mainly for a system which handles problems that can be defined using mathematics models.

Based on architecture system mentioned above, there are two input categories such as fuzzy and non-fuzzy input. Fuzzy input consists of internal and external customer factors based on SWOT theory to determine firm strategic positioning. Internal factor contains product price, customer number, and operational/production cost/. Meanwhile, external factor consists of competition number within the market area, product price that is determined by a competitor, and also location or distance nearby minimarket or competitor.

3.2. Non-Fuzzy Input

After fuzzy input is being conducted and resulted Σx (sigma 'X') value, next step will be conducting conversion calculation to determine the value of the non-fuzzy input. Non-fuzzy input consists of various variables such as value of market share, monthly expenditure per capita, sales tax, and area inflation factor. Each variable has a different percentage which influences the competitiveness of small business in commerce sector. Percentage provision for each variable can be flexible since the system that applied in the present study is dynamic. In other words, *domain expert* is able to change the percentage based on competitiveness desire of the area. Detail of conversion calculation for each non-fuzzy input will be described in the next paragraph.

3.3. Conversion Calculation Process of Market Share

Concerning conversion calculation process of market share, *domain expert* determines 30% (thirty percent) in influencing the competitiveness of small business in commerce sector. That process mentioned above is acquired from market share data which then the average rate is determined and divided into 2 (two) variables. The market share data of small business in commerce sector (groceries) for Surabaya area are taken from Surabaya Statistics Bureau (East Java in Number, 2015).

3.4. Conversion Process of Expenditure per Capita

The next step is conducting conversion process of monthly expenditure per capita value into a percentage. For this process, *domain expert* is determining 30% (thirty percent) in influencing the competitiveness of small business in commerce sector (groceries). Conversion value process is taken from expenditure per capita, later on, the average rate is determined and divided into 2 (two) variables. The expenditure per capita data of small business in commerce sector (groceries) for Surabaya area are taken from Surabaya Statistics Bureau.[32]

3.5. Conversion Process of Index Value of Consumer Price (IHK)/Area Inflation

The following step is calculating process in order to determine index value of consumer or area inflation. Concerning this process, *domain expert* is determining 20% (twenty percent) in influencing the competitiveness of small business in commerce sector (groceries). The index value of consumer price/area inflation percentage data is taken from Surabaya Statistics Bureau (East Java in Number, 2015) on February 2016.

3.6. Conversion Process of Tax Area Level

The next stage of processing data is by calculating in order to determine the conversion of tax area level. Regarding this process, *domain expert* is determining 20% (twenty percent) in influencing the competitiveness of small business in commerce sector (groceries). Tax area level data is taken from Surabaya Statistics Bureau.[33]

3.7. Output System

After determining $\Sigma x \Sigma x$ and $\Sigma y \Sigma y$ values, the last stage that needs to be taken is comparing both values by applying rule "IF THEN ELSE" in order to achieve recommendation decision. When the value of $\Sigma x \Sigma x$ (sigma 'X') bigger than $\Sigma y \Sigma y$ (sigma 'Y') it can be said the system is suggesting groceries be concerned about quality product and service as their competitiveness strategy. Vice versa, when the value of $\Sigma x \Sigma x$ (sigma 'X') smaller than $\Sigma y \Sigma y$ (sigma 'Y') it can be said that the system is suggesting groceries be more focused on product price as their competitiveness strategy. Meanwhile, when the value of $\Sigma x \Sigma x$ (sigma 'X') same as $\Sigma y \Sigma y$ (sigma 'Y') therefore it can be said that the system is suggesting groceries pay attention toward certain segment differentiation of their product. Based on case study of "TIGA PUTRA" grocery within the present research, this store has sigma "X" value as following $\Sigma x \Sigma x = 34$ meanwhile it has sigma "Y" as follow $\Sigma y \Sigma y = 39$, therefore it can be concluded that recommendation given by the system as form of output system is "COMPETITIVENESS THAT NEEDS TO BE CONCERNED BY TIGA PUTRA GROCERY IS ABOUT PRODUCT."

4. CONCLUSION

Based on crosstab analysis result it can be seen that all internal and external environment constructs have significance value above 0.005. It means that all constructs have tight relation with competitiveness constructs mainly construct regarding price or differentiation focus on a certain segment. Moreover, tight relation makes grocery easy to make an accurate decision in facing competition level that exists. Furthermore, based on Fuzzy logic analysis toward groceries as the subject of research in which it is analyzed based on internal and external also the conversion of competitiveness coupled with comparing both values using "IF THEN ELSE" as the requirement in order to a recommendation decision. The recommendation result that is achieved from this system as an output is "COMPETITIVENESS THAT NEEDS TO BE CONCERNED BY TIGA PUTRA GROCERY IS ABOUT PRODUCT."

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