The Role of Information Technology in Developing Competitive Strategies for Retail Businesses

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Abstract. The purpose of this study is to find a model of retail store competitiveness strategy approach using information technology so that retail stores can find the right and fast competitiveness strategy to increase the volume and number of customers. The method used in this research is quantitative descriptive by using cross tabulation analysis technique, SWOT analysis and logistic regression analysis. From the research results can be seen that the position of retail store competitiveness is relatively low against main competitors (mini market franchise) in Surabaya, Malang and Batu. Especially in terms of price competition and lack of ability to reduce operational costs become the main cause. And the existence of information technology is very helpful in retail store in deciding strategy of competitiveness that will be done. Output of retail store information competitiveness system also shows relatively similar results, so the use of information technology is very effective and efficient to determine the right strategy in improving the competitiveness of retail stores.

1. Introduction

Indonesia is ranked 12th in the Global Retail Development Index (GRDI) 2015 released by AT Kearney. This is the highest retail growth rate ever achieved by Indonesia in the index since 2001. Despite a slight decline in retail sales per capita last year, total retail sales grew by 14.5%. This sector declined early this year, but retail remains a bright spot for large Indonesians and middle-class growth. AT Kearney noted retail market in Indonesia currently reaches USD326 billion or worth Rp4.306 trillion.

The economic growth of East Java in 2015 is 5.44 percent, the growth in the category of accommodation and drinking accommodation is 7.91 percent\textsuperscript{[1]}. Providers are provided by retail stores. The determination of Retail competitiveness becomes an urgent need to prepare Retail in the face of free market competition MEA December 2015. The existence of Information Technology is a major macro-environment variable that affects the development of many trade industries. Because the use of Information Technology will greatly benefit both parties both customers and stores. This is because customer satisfaction increases because the goods are already available, the service can be more personal and more convenient launching shopping. Advances in information technology for Southeast Asia, the value of e-commerce sales in ASEAN countries is still very small, less than 1% of

Retracted
total sales of the retail industry sector. Compare with countries in Europe, or with China and the United States reaching 6% to 8%. But in the next few years, still according to AT Kearny, the growth of retail sales value through e-commerce in ASEAN countries can increase up to 25% per year. Research Markplus in 2013 shows, from 74.6 million Internet users in Indonesia, 20% do shopping online. The number of internet users who make online transactions is still inferior to Thailand, Philippines, Vietnam, Singapore, and Malaysia, which reaches 60% to 80% of Internet users make online transactions.

Based on data from Central Bureau of Statistics of East Java, the number of retail sector small businesses in East Java in 2011 as many as 1448 and in 2014 increased to 2304, where growth from 2011-2014 by 59%. While many retail owned by small enterprises in 2011 as much as 8387 and in 2014 to 8393, which only grew by 0.7%[1]. The City of Surabaya is the capital of East Java with a growth of 18.56% retail sector[2]. Malang city in 2015 reached 5.61%, as an area close to tourism. The economy of Malang City has a growth of retail sector of hotels and restaurants to total GDP is 37.67% [3]. Kota Batu in the City of Malang has a growth of retail sector of 6.44%.[4]. The existence of information technology makes retail business close to its customers where when information like discount products and other special offers on products are known in real time, it can increase customer satisfaction[5]. The Information Technology is needed to support small business in the field of retail to enhance strategic competitiveness by providing speed of customer information to improve customer satisfaction. The main weakness of SMEs business in Indonesia is because it is still traditional and not supporting the utilization of Information technology. In addition, according to an interview with Deputy Trade Minister Bayu Krisnamurthi in August 2014 (finance.detik.com), only found about 75 thousand SMEs that use the internet to run its business. From the above two sources, it can be concluded that SMEs who utilize information technology either only in the form of payment assistance by using electronic debit or credit card, or using the internet as a sales medium, is still very least (Kompasiana.com). Rogers) posited five attributes in Innovation Diffusion Theory that became the decisive adoption of new technology[6]. The first attribute, Relative advantage indicates the extent to which a technological innovation is more than the previous innovation. These benefits can be seen from a technical standpoint, economical, prestige, convenience and satisfaction. If one feels that a technological innovation provides a high relative advantage then he will adopt the technology. The second attribute, Compatibility is the appropriateness of a technological innovation to the adopter, adopter experience, and adopter needs. The third attribute, Complexity [6] refers to the difficulty level of understanding and the use of a technological innovation. The more complicated the application to a technological innovation will be more difficult to adopt. The fourth attribute, Trialability is the extent to which a technological innovation can be tried and tested[7]. The last attribute to consideration in adopting new technology is observability, this attribute is related to the extent to which the adoption of technological innovations can be observed and communicated. If an innovation cannot be tried before it is adopted it will increase the individual's desire to adopt new technology.[8]. Some researchers include [9]–[12] concluded that in measuring acceptance of technological innovation adoption, beside technical aspect there are three other things that are not less important that aspect of environment, organizational aspect, and individual aspect. The existence of the retail sector of small business should be close to the consumer, because consumers will feel more satisfied when the place is easy to achieve and also convenient concluded that in measuring acceptance of technology innovation adoption, beside technical aspect there are three other things that are not less important that aspect of environment, organizational aspect, and individual aspect[10], [12]. One form of technological innovation that takes into account the technical aspects, aspects of the environment, organizational aspects, and individual aspects, and can be tried and tested is fuzzy logic which is one of the components of soft computing. Fuzzy logic was first introduced by prof. Lotfi A. Zadeh in 1965. The basis of fuzzy logic is the theory of the fuzzy set. In the fuzzy set theory, the role of membership degree as a determinant of the existence of elements in a set is very important. Membership value or membership degree or membership function is the main characteristic of logic with fuzzy logic[14].
Competitive advantage is not enough for retail sector small businesses to compete within market. They also need sustainable competitive advantage in order to strengthen their capacity. Sustainable competitive advantage is needed to establish high quality product which has competitiveness values in order to counteract the existence of minimart, super market, coupled with hyper mart. 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) The use of information technology to improve competitiveness of micro and small enterprises trade sector[15]. According to[16] stated that internet has changed business behavior coupled with competition nature. Moreover, internet is not changing business model rather than it is used as tool to elaborate competitive advantage.

The internet marketing can be defined as an effort which is done by company to inform, communicate, promote coupled with marketing through internet [17]. E-commerce is an example of internet marketing which becomes marketing trendsetter for small and micro enterprises nowadays in Australia and Denmark. Study result shows that there are two environmental factors which support e-commerce to become trendsetter in Australia and Denmark which are customer pressure coupled with service quality in related to information and technology. This phenomenon is matched with research conducted by [9]in south Italy. Service range influences development of small stores. In other words wide range services of minimarket influence the development of traditional store. Average friction around 57,29% or one minimarket influences 4 stores [18]. Furthermore high number of minimarket accretion stimulates revenue changing of traditional store. Short distance (1 meter) between minimarket and traditional store stimulates reduction of traditional store revenue around 0,02% [19].

The present study discusses theory about human resources as sustainable analysis tool which is developed into a model of company resource. This model is an analysis of four information technology attributes which are capital needs, exclusive technology, technical information technology skill and managerial information technology skill which might be used as sustainable competitive advantage sources.[20].

The present study examines significance factors which influence adoption and implementation of ecommerce b-to-b within small and micro enterprises in Australia and Denmark. It can be seen that there are two environmental factors which support e-commerce to become trendsetter in Australia and Denmark, which are customer pressure coupled with service quality in related to information and technology.

2. Method

The respondents of the present study are retail sector small businesses owner in Surabaya City, Malang City, and Batu City. Minimal number of respondents is 385 in which it is rounded into 400 which consist of 200 respondents from Surabaya City, 100 respondents from Malang City and 100 respondents from Batu City[21]. Research stages are started by examining references of researches and official documents concerning small business competitiveness of retail sector. The next stage is by conducting survey questioner to collect data. Later on, the data is analyzed coupled with categorized into three sections which are: Internal Analysis Factors, External Analysis Factors, Analysis of the influence between variables using SWOT analysis[22] and Cross tabulation[23] are used as the approach in analyzing the data in order to determine the connection between retail sector of small business factor and positioning. The result of the analysis logistic regression is compared with output of fuzzy logic result that exist in store front competitiveness information system.

3. Result and Discussion

Internal and External Environmental Construct Variable

Based on literature reviews, it can be seen factors that form competitive positioning mentioned above need to be anticipated mainly for commerce small and medium enterprises by producing accurate strategic plan. One of the successful key in determining accurate strategic plan is concerning market selection and determining strategy to compete within competition [24], [25]. Porter stated that
competitiveness eminence can be achieved through various strategies such as business strategy which consists of cost leadership, differentiation and focus\cite{26}. Continuous competitiveness eminence can be achieved when the management has ability to create and implement resistant strategy toward imitation competition and able to establish long term competition\cite{27}–\cite{29}. Moreover environment factor also play important role toward business condition since this factor able to determine what kind of strategy that can be applied\cite{30}, \cite{31}. A good way to formulate effective and efficient strategy is by combining internal and external organization point of view\cite{32}, \cite{33}. Results that are taken from studies mentioned above can be used as guidance in establishing retail sector of small business competitiveness in global competition. Nowadays, competition is only happened within one level but it develops into multilevel competition level. The Indicators that can be formulated based on the things mentioned above are: 1) Internal Analysis Factors (micro) that can be used are financial report, retail sector of small business sales report, selling price, number of consumers, and retail sector of small business operational cost. External Analysis Factors (macro) which can be used are: a) Competitor numbers b) Competitor price mainly special competitor such as Indomart and Alfamart c) Location distance with minimarket

The next step is distributing questionnaire by applying likert scale that distributed into retail sector small businesses respondents. Collected data is executed using cross tabulation analysis coupled with SWOT analysis. The result of validity and reliability test the question items to measure internal environment indicator, external environment and competitiveness as shown in table 2, table 3 and table 4, where the value of r arithmetic and Corrected Item-Total Correlation is greater than r table (0.1388) also the value: r-Alpha ≥ 0.6 which indicates that the question items in this study are valid and reliable.

**Table 1.** 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 |

The result of data analysis on Table 1 crosstab construct analysis result of internal and external competitiveness environment indicators, it is showed that all indicators have value below 0.05. In other words it can be said all constructs have tight relation with competitiveness construct. The retail sector small businesses which can be used as infrastructure in planning business and positioning its own competitiveness since commerce growth is firm coupled with steady. It is matching with the statement of \cite{34} which stated that established planning will be beneficial for small firm within dynamic industry that developed rapidly.

**Competitiveness Construct Variable**

To create competitive advantage, the company can do three forms of business strategy choice of unit that is\cite{26}:

1. Differentiation (Differentiation) is taking the customer as the main point of attention. This strategy focuses on building buyers' perception of quality, product design, technology, distribution network, heavy image, material or service.
2. Overall cost leadership (Overall cost leadership) It is a strategy that takes into account competitors rather than customers. The company focuses on the low price on buyers.
3. Focus (Focus): This strategy is used by businesses who want to avoid direct confrontation with competitors by way of concentrating on small market share (niches). The basic principle is by using a comprehensive cost leadership strategy (low cost).

The Analysis of Logistic Regression for the competitiveness of Differentiation

Table 2. The Results of Simple Regression Logistic Differentiation Analysis

| Sub Variable          | p-value | Description                          |
|-----------------------|---------|--------------------------------------|
| The Price of Product  | 0.001   | goes into the multivariate test      |
| Number of Customers   | 0.000   | goes into the multivariate test      |
| Operational Cost      | 0.840   | Not entering the multivariate test   |
| Number of Competitors | 0.001   | goes into the multivariate test      |
| The Price of Competitors | 0.328   | Not entering the multivariate test   |
| Distance with competitor | 0.003   | goes into the multivariate test      |
| Market Share          | 0.369   | Not entering the multivariate test   |
| Spending per capita   | 0.079   | goes into the multivariate test      |
| Tax                   | 0.049   | goes into the multivariate test      |
| Inflation             | 0.065   | goes into the multivariate test      |

From Table 2, the result of simple logistic regression analysis is known from 10 variables it turns out that there are 7 into the multivariate model and 3 which must be removed from the multivariate model. Then the 7 variables are entered into multiple logistic regression.

Table 3. Multiple Logistic Regression Analysis Results Differentiation

| Sub Variable          | B       | S.E.   | Wald   | df | Sig. | ODDS Ratio/ Exp(B) | 95.0% C.I for EXP(B) |
|-----------------------|---------|--------|--------|----|------|--------------------|----------------------|
|                       | 3.721   | 1.623  | 4.530  | 1  | .103 | .678               | .317                 |
|                       | -0.682  | 0.419  | 2.801  | 1  | .096 | 1.540              | 1.003                |
|                       | .647    | 0.373  | 3.479  | 1  | .062 | 2.006              | 1.149                |
|                       | -0.226  | 0.621  | 0.133  | 1  | .715 | 0.797              | 0.236                |
|                       | -7.013  | 2.130  | 10.838 | 1  | .001 | 0.001              |                      |

The explanation in Table 3 that sub variables of product selling price (0.452), tax (0.595), inflation (0.715), distance with competitors (0.317), number of competitors (0.103) and expenditure per capita (0.62) have p value > 0.05. While subvariable Number of subscribers (0.000) has p value < 0.05. The next step, subvariables that have p value > 0.05 are removed from the model.
Table 4. The Results of Logistic Regression Analysis of differentiation fit model

| Sub variable | B   | S.E. | Wald | df | Sig.  | ODDS Ratio/Exp(B) | 95.0% CI for EXP(B) Lower | Upper |
|--------------|-----|------|------|----|-------|------------------|--------------------------|-------|
| Number of Customers | 3.679 | .744 | 24.46 | 1  | .000  | 39.62            | 9.220                     | 170.2 |
| Constant     | -6.675 | 1.459 | 20.93 | 1  | .000  | .001             |                          |       |

The result of multivariate analysis showed on the table 4, that after subvariable of product selling price (0.452), tax (0.595), inflation (0.715), distance with competitor (0.317), number of competitor (0.103) and expenditure per capita (0.62) 10% is subvariable the number of customers (5%) so the model is said to be final. Based on the result of multiple logistic regression analysis, it can be concluded that from all independent variables allegedly affect the competitiveness of different grocery stores there is one subvariable (the number of customers) that most influence to differentiation of store grocery competitiveness with p value 0.000 <0.05. The largest OR value obtained is 39.623 means that the number of customers perceived respondents have an increase of 39.623 times leads to the competitiveness of differentiation. Based on multiple logistic regression analysis found that a grocery store that has more number of customers will facilitate them to create differentiation competitiveness. This result is in accordance with the research[35] on the Competitive advantage of the independent small businesses in Soweto who found in his study that To survive and grow, small business owners need to identify and focus on their competitive advantages over competing businesses. Identifying sources of competitive advantage is based on an in-depth knowledge of the market environment, including customers and competitors. Small business owners can achieve competitive advantage by differentiating themselves through providing unique value packages, including low prices, product leadership and customer intimacy. In this study, it was found that respondents were differentiated in terms of price, customer relationship, hours of shopping and personal attention. Their scores for this aspect were used to calculate the scores of differentiation values, product quality, the best brands and various products are also important aspect of the product package value of small businesses, and therefore used in calculating the value score of the product. With statistical testing it was found that older businesses and expanding product differentiation significantly outperformed younger businesses and contractors. When looking at differentiation value scores (based on price, customer relationships, hours of shopping and personal attention), the focus on the price of an older business has a growing trend due to their ability to deliver a lower price than a younger business (having a number of customers the fewest tend to stagnate or shrink and are unable to provide a lower price, which may in turn negatively impact their turnover. Lower prices can allow older and growing businesses to further increase revenue.

Table 5. The Results of Simple Logistic Regression Analysis of price competitiveness

| Sub Variable     | p-value | Description                  |
|------------------|---------|------------------------------|
| The Price of Product | 0.516   | Not entering the multivariate test |
| Number of Customers     | 0.062   | goes into the multivariate test |
| Operational Cost         | 0.000   | goes into the multivariate test |
| Number of Competitors     | 0.240   | goes into the multivariate test |
| The Price of Competitors     | 0.814   | Not entering the multivariate test |
In the table 5 can be explained that the results of simple logistic regression analysis is known from 10 variables it turns out there are 3 into the multivariate model and 7 that must be removed from the multivariate model. Then the three variables are entered into multiple logistic regression.

Table 6. The Results of Multiple Logistic Regression Analysis of price competitiveness

| Sub Variable         | B     | S.E.   | Wald  | df | Sig. | Exp(B)  | 95.0% C.I. for EXP(B) |
|----------------------|-------|--------|-------|----|------|---------|------------------------|
| Number of Customers  | .430  | .462   | .865  | 1  | .352 | 1.537   | 0.621 - 3.805          |
| Operational Cost     | 2.043 | .424   | 23.20 | 3  | .000 | 1.444   | 1.359 - 17.71          |
| Number of Competitors| .367  | .419   | .770  | 1  | .005 | .380    | .144 - 3.279           |
| Constant             | -3.546| 1.264  | 7.869 | 1  | .005 | 0.029   |                        |

Sub variable number of customers (0.352) and number of competitors (0.380) has p value > 0.05. While subvariable operational cost (0.000) has p value < 0.05. Given that other variables are greater than 0.25, it is impossible to include them into the multivariate model, so that the model is considered final. Based on the multivariate analysis result, it can be concluded that from all independent variables suspected to affect the price competitiveness of the grocery store there is one subvariable (operational costs) most influential on the price competitiveness of a grocery store with p value 0.000 < 0.05. The largest OR value obtained is 17.714 which means that the number of customers perceived by the respondent has a 7,714 chance of causing price competitiveness. This shows that a grocery store capable of price competitiveness is those who are able to control and minimize the operating costs of their grocery store. This is in line with the study of [36] which states that the dimensions of a company's competitiveness consist of cost, quality, delivery time, and flexibility. And research [37] which states that the location of a business has a significant effect on the company's operating costs, production or service prices and affect the competitiveness of the company.

The Use of Information Technology To Improve Competitiveness

The commonly, managerial system of small businesses of retail sector possesses traditional behavior in conducting business therefore adoption of information and technology for small businesses of retail sector can be seen as a solution to make and plan strategic decision. In order to attract retail sector small businesses owner in using information and technology, simple design computer application will be suitable to be used by retail sector small businesses in developing their business. Therefore, in order to make quick decision, we need computer to accelerate drafting process in making business strategic plan. With the relative attractiveness of a small businesses of retail store in the position of being, meaning a small businesses of retail store is still quite attractive for businesses, especially strat-up businesses and home-based business. A small businesses of retail store should be able to increase the efficiency of creating competitiveness of its business. The use of ITs is a way of creating cost efficiency, this according to the results of research[10] that state ITs transform the strategic position of organisations by altering their efficiency, differentiation, operational cost and response time. In particular, ITs have stimulated radical changes in the operation and distribution of the tourism
industry. Based on the architectural design that has been made and tested the validity and reliability through statistical tests and domain test ekspert [15]. Then made an information system application SMEs competitiveness of the trade sector, especially retail shop.

**Activities at the application development stage include:**

1. Programming, application of grocery store competitiveness strategy with based on fuzzy logic is web-based using PHP programming language. PHP is a web programming language that the last 5 (five) years is very popular. In addition to supporting tools that offer with a variety of free features, on the other hand PHP is a web programming language that is very easy to understand. PHP is a web programming language that is server side, where data will be processed in the server and then displayed to the client through the browser. PHP is also very supportive for the use of query access into database programming.

2. Database, for the database we use in the application of this competitiveness store strategy using MySQL database. MySQL is a multiuser database with Terra Byte (TB) capacity. On the other hand, MySQL is also widely supported by tools from various developers that are freeware so is the MySQL database that can be used for free. Even on some web servers offered by the developers of MySQL has become one unity installer (package) with PHP the use of Apache, which use is much easier to use.

**The second stage is Activity Testing & Implementing in:**

1. Testing Program, on testing our system using all the data of SMEs located in the City of Surabaya with divided into 5 Areas namely Surabaya West, East, South North and Central Surabaya. The total data of the total area in Surabaya is 390 data. Testing our important programs with the intent and purpose to determine the level of system accuracy.

2. Program Implementation In Retail Stores, here are some views of the application of fuzzy logic based store competitiveness.

![Figure 1. Home View Information System Competitiveness Retail Stores](image-url)
Figure 1 is an information system retail information retail, which consists of variables used as internal and external environmental factor analysis variables based on each region. The data form we put into the database so that all regions in Indonesia can be included in the system.

Figure 2. shows the output on differentiation competitiveness strategy

In Figure 2, the output display on differentiation competitiveness strategy seems to be seen that retail store area has the advantage of competitiveness of differentiation. And when viewed from the recap of respondents answer then the stores have more customers than stores outside the region. And this result is similar to the result of multiple logistic regression analysis showing that wholesale stores that have more customers will make it easier for them to create competitiveness of differentiation.

Figure 3. shows the output on price competitiveness strategy
In Figure 3, the output display on the price competitiveness strategy seems to be seen that the retail store area has the advantage of price. And when viewed from the recap of the respondent's answer then the stores have low cost operational than the shop outside the area. And this result is similar to the result of multiple logistic regression analysis that shows that wholesale stores that have low cost operational will make it easier for them to create competitiveness of price.

4. Conclusion
The results showed that the position of retail store competition is relatively low against the main competitors (mini market franchise) in Surabaya, Malang and Batu. From the matrix it can be seen that the position of price competition is in low position and the result of the research shows that the cause of the low price competition due to the lack of ability to reduce the operational cost, especially related with the interest of the loan. Differential competitiveness is also not optimal because of the quality products that still do not support competitiveness. While the competitiveness of the focus has not become the choice of retail stores considering they are unable to compete with the existing franchise. This condition causes business results to decline even if the proximity of customers is relatively better than competitors. Similarly, from the aspect of service, the competence still in a relatively better competitiveness than competitors. For that existence the existence of information technology is very helpful retail store in deciding strategy of competitiveness to be done. Output on the retail store information competitiveness system also shows relatively similar results, so the use of information technology is very effective and efficient to determine the right strategy in improving the competitiveness of retail stores.

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