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Competitive Advantage Model Through Integration of Supply Chains and Information Technology in SMEs in Cimahi City

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Key words: Supply chain integration information technology, competitive advantage, management, distributors

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Abstract: Management of the supply chain of food and beverage products needs to be managed efficiently. Supply chain integration needs to be applied to the management of food and beverage businesses in Cimahi city so that connectivity from suppliers, manufacturers and distributors can carry out their roles well. Another problem in the food product supply chain is the value/value received by each member (supplier, manufacturer and distributor). Small business operators field of foods and beverages need to use information technology to improve productivity and competitive advantage of the business they run. This study wants to find out the Competitive Model of Competitiveness through the Integration of the Supply Chain and Information Technology in the Food and Beverage SMEs in Cimahi city. This research is quantitative research using the Partial Least Square (PLS-SEM) method. The population in this study is small-scale food and beverage businesses in the city of Cimahi. The expected results of this study can explain the competitive advantages that are influenced by supply chain integration through supply chain performance.

INTRODUCTION

The opening of the trade in the Asean Economic Community (MEA) has become a new market for entrepreneurs in Indonesia. This opens up wider opportunities for small businesses in Indonesia to develop their markets. But small businesses must improve the quality of their products to be able to compete in the As ean market. Small businesses must prepare themselves better to win the competition[1].

Food sector SMEs need a strategy to gain a competitive advantage in the market. SMEs that are competitive according to Russell and Millar in Delmayuni. etc., must have five competitive priority components, namely cost, quality, flexibility, delivery and innovation. Small businesses have not contributed much in the economy because they still experience various obstacles both external and internal constraints.

In research[2] strategies to improve competitive advantage can be done by collaborating to maintain continuity of raw material supply, development of SME industrial product areas and increasing the role of government and universities in improving the development of SMEs.

Companies need information technology methods and techniques to integrate their internal business functions[3]. Information technology can help companies

to be more efficient increase productivity and respond quickly to consumer needs[4]. Information technology brings new opportunities in business and helps SMEs to deal with their business problems. However, the adoption of IT (Information Technology) by SMEs is still low compared to large companies. The results of the AMI Partners research institute in 2000 only 20% of SMEs in Indonesia had computers.

Still, lack of understanding of the strategic role of IT related to marketing, customer service and the development of new products is thought to be a problem of low adoption in IT. Small business actors are still an obstacle related to the use of information technology, whereas information technology provides high benefits in the management of small businesses.

IT helps in integrating supply chains and improving supply chain performance[4]. The results of the study show that IT has helped in revolutionizing traditional logistics and supply chains to improve efficiency and response (Mao, et al, 2016). IT greatly makes internal and external integration in the supply chain.

Supply chain integration can provide benefits for small entrepreneurs, especially in the areas of food and beverages. The food and beverage industry requires a continuous supply of raw materials so that there needs to support consistent suppliers to supply these raw materials. One of the problems in food products is the breadth of the food supply chain from suppliers to consumers so that the costs incurred become inefficient. In addition, food products have a large capacity in distribution so that the product loss rate reaches 20% starting from suppliers to consumers.

Small food and beverage businesses in Cimahi city have a role to play in improving the economy of the community. In addition, the city of Cimahi which is a region that is a supporter of the city of Bandung must be able to take advantage of high opportunities, especially the provision of food and beverage products.

According to Septriana, SMEs in the city of Cimahi have started to literate ICT. "Moreover, ICT Volunteers through the IT movement Holic have tried to assist SMEs in the use of ICT. This needs to be encouraged by the government making effective programs in opening up the SME market and disseminating it to the public[5].

Special objectives: The specific objective of this research is to analyze the influence of supply chain integration and information technology on the competitive advantage that is expected to help small businesses in the food and beverage sector in Cimahi city. The results are expected to be able to provide answers to problems that occur in supply chain integration information technology and competitive advantage.

MATERIALS AND METHODS

Research design: According to the level of explosion (level of explanation), this research is grouped into descriptive and associative research. Associative research is the relationship and influence of one variable on other variables.

Reaffirmed by the opinion associative descriptive research is research conducted to determine the value of independent variables while associative research is research that aims to determine the relationship or influence between two or more variables. From associative research, there will be a theory that can function to explain, predict and control a phenomenon or phenomenon.

The focus of this research is to find out the effect of the integration of supply chains and information technology on the competitive advantages of processed food products in small businesses in the food and beverage sector in Cimahi city. The author wants to know the perceptions of small business owners in the food and beverage sector regarding supply chain integration information technology and, competitive advantage. While the goals to be achieved are knowing the influence of supply chain integration information technology and competitive advantage.

The variables in this study are supply chain integration (X1) information technology (X2) and competitive advantage (Y). Supply chain integration is measured by the dimensions of customer relations information exchange through networks, distribution of market information, sharing of information on product availability, a process of managing market fulfillment and level of customer complaints and evaluating customer satisfaction. Information technology is measured by Human device (HR) variables, technical devices and information and knowledge devices. Competitive advantages are measured by the dimensions of price, quality, delivery and market response. The measuring scale used uses intervals.

Population in this study are small business owners of food and beverage in Cimahi city. The sample is part of the population and is a member of the selected population. The sampling is a selection process for a number of adequate elements from the population. The Sample can be generalized to the population, the sampling technique is done randomly (random), so that, every member of the population has an equal chance to be selected into the sample. Random sampling is a probability sampling of the sample selected by the sample that meets the criteria of the researcher (statistically random sampling). The sample

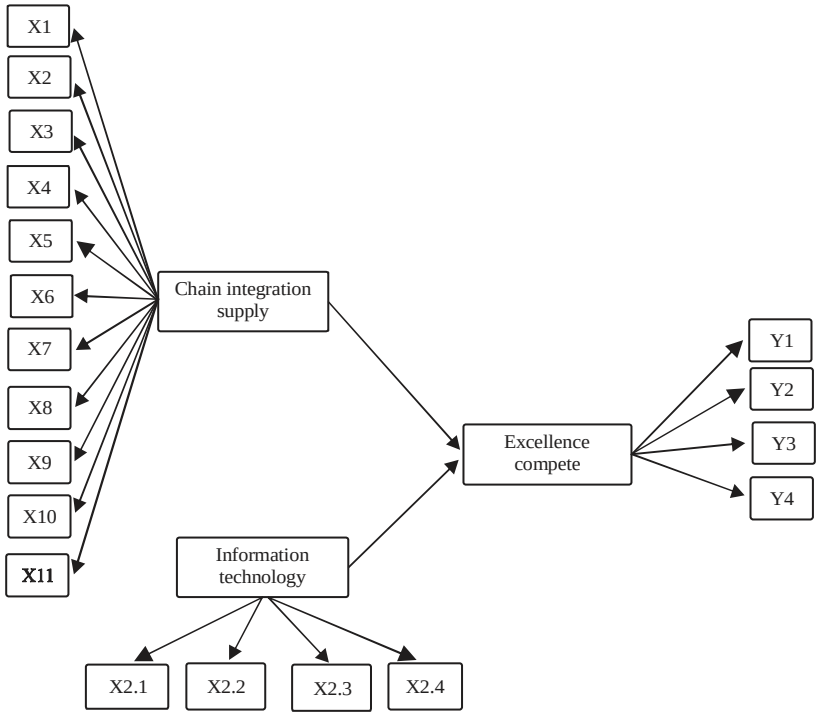

Fig. 1: SEM PLS model

in this study is small business owners in the culinary field with a minimum turnover of 500 thousand rupiahs per day, more than three year's duration of business.

In this study the data generated in the form of perceptions, attitudes or opinions. To measure this perception the scale used is the Likert scale. The activities in processing data are as follows: Editing, checking the list of questions that have been submitted by the data collectors. Coding, classifying the answers of the respondents into categories. Tabulation, work making tables. Answers that have been coded into answer categories are then included in the table. Verification, checking the correctness of the results of the survey that has been conducted.

An important step in the context of data collection activities is to test the instrument (measuring instrument) to be used. The research instrument testing activities include two things, namely testing validity and reliability To analyze qualitative data through qualitative and quantitative analysis. In the descriptive analysis, each variable is categorized into four[7] categories of measurement results, namely: very low, low, low, high. Each category is calculated by frequency and proportion and the distribution is arranged. Categorization is done by reviewing the position of the total variable score within the minimum value limits, first quartile, median, quartile III and maximum that can be achieved as follows:

- Minimum≤total score <Quartile I: Very Low
- Quartile I≤total score <Median: Low
- Median kor s kor total <Quartile III: Moderate
- Quartile III≤total score <Maximum: High

To answer associative questions, who want to know the relationship of coordination, supply chain integration and competitive advantage using Partial Least Square Structure Equation Modeling (PLS-SEM). The advantages of applying verification analysis using PLS-SEM can use small samples or large samples as well as exploratory research and be able to explain latent variables.

Elements in the PLS-SEM path analysis in Fig. 1 are inner models and outer models. The inner model illustrates the relationship of arrows between independent latent variables (1 and X2) and the dependent variable (Y). Outer model on the show by the relation of arrows between latent variables both dependent and independent and indicators. The Outer model consists of two measurements, namely reflective and normative measurement models. PLS-SEM measurement path using 3 SMARTPLS program.

Evaluation of outer reflective models: Evaluating the outer model aims to evaluate indicator variables. The measurement models for latent variables in PLS-SEM are two, namely reflective models and formative models. Evaluation of reflective models consists of. Reliability indicator based on the outer loading, if the outer loading value is >0.7, the indicator variable needs to be

Table 1: Supply Chain integration categorization in small food and beverage enterprises in Cimahi city

Indicators	Average	Category
Relationship with customers	3.840	Good
Exchange of information through the network	3.605	Good
Use of a computerized system	2.38.0	Less
Distribution of market information	2.805	Less
Distribution of product availability information	3.06	Good
Order fulfillment management process	3.38	Good
Customer complaint level	3.17	Good
Customer satisfaction evaluation	3.15	Good
Average total	3.18	Good

Questionnaire, reprocessed 2018

maintained for the theory test while for exploration testing between 0.7-0.5. And if it is <0.5, the indicator variable must be omitted. Discriminatory validity. Using two methods, cross loading variables. Indicator variables for latent variables must be greater than other latent variables. Internal consistency. Composite reliability is used to measure internal consistency. The theoretical test of the test must be >0.5. Convergent validity. Convergent Variance Extracted (AVE) is used to measure Convergent validity. AVE values must be >0.5.

Inner model evaluation (structural model): The significance and magnitude of the influence of independent latent variables. This test is to find out whether independent latent variables affect dependent latent variables, through the t-test. And evaluate each independent latent variables to see the path coefficient value (path coefficient). The Coefficient of Determination R^2. The coefficient of determination measures how much variation in the dependent latent variable is explained by independent latent variables.

RESULTS AND DISCUSSION

Supply chain integration descriptive analysis: Supply chain integration is expected to be able to unite activities that have similarities between members of the supply chain. In this section, we will explain supply chain integration based on relationship indicators with information exchange through networks, use of computerized systems, market information sharing information sharing of product availability, order fulfillment management process, customer complaint level and customer evaluation. The following are explained the results of processing questionnaire data related to partner relations (Table 1).

According to, the indicators for supply chain integration as category Good with an average score of 3.18. These results show that small businesses in food and beverages in the city of Cimahi have carried out supply chain integration activities in their businesses. With these results are still visible some indicators are still category less is the use of computerized systems and the distribution of market information. Next will be explained the competitive advantages of small businesses in the food and beverage sector in Cimahi city. The results are explained in the following Table 2.

Table 2: Categorization of information technology in SMEs in the food and beverage sector in Cimahi city

Dimension	Average	Category
HR device	2.91	Enough
Technical device	3.48	Good
Information and knowledge tool	3.54	Good

Questionnaire, Reprocessed 2018

Table 3: Categorization of advantages competing with SMEs in the food and beverage sector in Cimahi city

Dimension	Rata-rata	Kategori
Customer response	3.940	Good
Cost	3.965	Good
Quality	4.095	Good
Delivery	4.235	Very good
Average total	4.050	Good

Questionnaire, reprocessed 2018

Table 4: Outer loading

Dimension	Information technology	SC integration	Competitive advantage
X1.1	0.696		
X1.2	0.868		
X1.3	0.649		
X2.1		0.763	
X2.2		0.722	
X2.3		0.533	
X2.4		0.510	
X2.5		0.602	
X2.6		0.739	
X2.7		0.670	
Y1			0.919
Y2			0.919
Y3			0.951
Y4			0.946

Questionnaire, Reprocessed 2018

Based on the information technology categorization table on SMEs in the food and beverage sector in Cimahi city, HR Devices are still categorized as Sufficient even though the Technical and Information and Knowledge Devices are in a Good category (Table 3).

Based on the competitive advantage categorization table above, it can be seen that food and beverage SMEs in Cimahi city have a Good and Very Good category for each dimension of competitive advantage (Table 4).

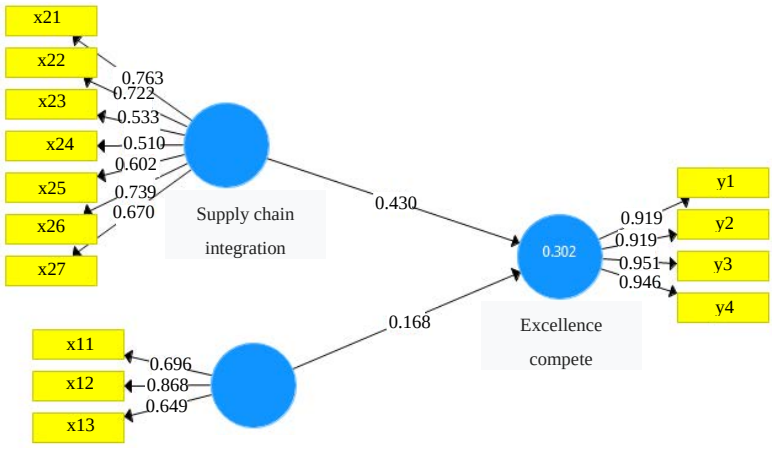

Fig. 2: Figure PLS-SEM alogaritm

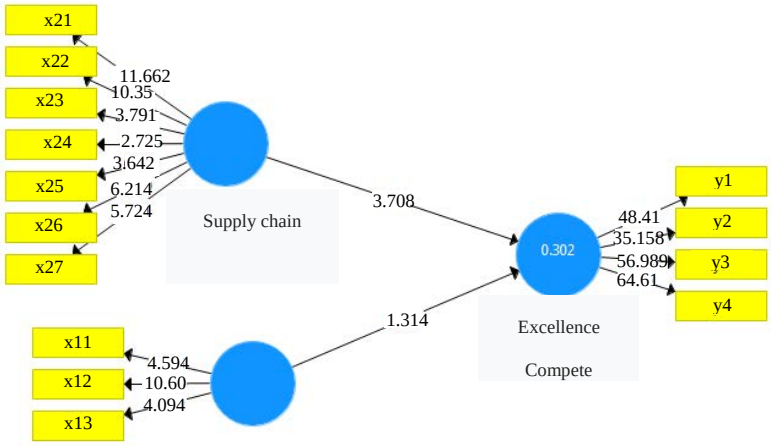

Fig. 3: Bootsraping PLS-SEM

Table 5: Value fornerlarcker

Variables	SC integration	Information technology	Competitive advantage
SC integration	0.655		
Information technology	0.533	0.934	
Competitive advantage	0.615	0.432	0.743

Table 6: Composite reliability

Variable	Composite reliability
Supply Chain integration	0.838
Information technology	0.965
Competitive advantage	0.785

Questionnaire, reprocessed 2018

Table 7: Evaluation of Average Variance Extracted (AVE)

Construct	F^2
Supply chain integration	0.529
Information technology	0.872
Competitive advantage	0.553

Questionnaire, reprocessed 2018

Model evaluation

Evaluation of outer models: Based on the value of outer loading, the value of outer loading of each dimension has an outer loading value of >0.5 meaning that all dimensions can be used to form the outer model (Table 5).

Based on FornerLarcker values, the value of all latent variables is higher than the other latent variables. So, that the model built fulfills the requirements of discriminate validity (Fig. 2 and 3).

Internal consistency: To measure internal consistency using composite reliability values. The following composite reliability Table 6. Based on the composite table reliability, to test internal consistency, the overall variable has a value of >0.7. This means that the built model meets the requirements to form a consistent model.

Convergent validity: In measuring convergent validity, the average variance validity value is used. The results are presented in Table 7-12. Based on the table Average Variance Extracted (AVE) shows that it has an

Table 8: Research variable path coefficients

Konstruk	Original samples	T-statistic	p-values
SC Integration→competitive advantage	0.430	3.708	0.000
Information technology→competitive advantage	0.168	1.314	0.190
SC integration→X2.1	0.763	11.662	0.000
SC integration→X2.2	0.722	10.358	0.000
SC integration→X2.3	0.533	3.791	0.000
SC integration→X2.4	0.510	2.725	0.007
SC integration→X2.5	0.602	3.642	0.000
SC integration→X2.6	0.739	6.214	0.000
SC integration→X2.7	0.670	5.724	0.000
Information technology→X1.1	0.696	4.594	0.000
Information technology→X1.2	0.868	10.603	0.000
Information technology→X1.3	0.649	4.094	0.000
Competitive advantage→Y1	0.919	48.414	0.000
Competitive advantage→Y2	0.919	35.158	0.000
Competitive advantage→Y3	0.951	56.989	0.000
Competitive advantage→Y4	0.946	64.618	0.000

Questionnaire, reprocessed 2018

Table 9: Value of $R^2$and value of R^2 adjusted

Construct	R^2	R^2 ajusted	Residual variables (v (1-R^2)
Competitive advantage	0.302	0.287	0.692

Questionnaire, Reprocessed 2018

Table 10: Inter-variable correlation values

Variables	Competitive advantage
Supply Chain integration	0.430
Information technology	0.168

Table 11: Evaluation of R^2

Construct	R^2	Adjusted R^2
Competitive advantage	0.302	0.287

Questionnaire, reprocessed 2016

AVE value above 0.5 meaning that all outer models for this study are valid, so, there is no need to omit indicators.

Value of path coefficient: The results of the bootstrapping process in SmartPLS produce path coefficients between supply chain management, cooperative performance and operating strategy variables. In addition, the bootstrapping result also shows the coefficient of relationship between latent variables and their dimensions.

From the Table 7, it can be seen that all dimensions have a significant effect on the latent variables. Based on the path coefficient values above, the relationship between models between variables can be expressed in structural equations. However, a residual variable is needed first.

The results of the residual variables are calculated based on the r-value of R^2. The results can be seen in Table 8. The constructed model that connects the variables of supply chain integration and information technology to competitive advantage can be revealed by structural Eq. 1:

$$Y = 0.287X+0.692 \quad (1)$$

Table 12: Evaluation of effect size (f2)

Construct	F^2
Supply chain integration→competitive advantages	3.708
Information technology →competitive advantage	1.314
Supply chain Integration→X2.1	11.662
Supply chain Integration→X2.2	10.358
Supply chain Integration→X2.3	3.791
Supply chain Integration→X2.4	2.725
Supply chain Integration→X2.5	3.642
Supply chain Integration→X2.6	6.214
Supply chain Integration→X2.7	5,.724
Information technology →X1.1	4.594
Information technology→X1.2	10.603
Information technology→X1.3	4.094
Competitive advantages→Y1	48.414
Competitive advantages→Y2	35.158
Competitive advantages→Y3	56.989
Competitive advantages→Y4	64.618

Questionnaire, reprocessed 2018

Equation 1 indicates the magnitude of the coefficient of supply chain integration and information technology on competitive advantage is 0.287 with 0.692 as the residual variable value. The influence of supply chain integration and information technology on competitive advantage 28.7% is a direct relationship of supply chain Management and information technology to competitive advantages. While

Inter-variable correlation: The results of the alogarithm PLS process using Smart PLS produce a correlation between variables from the variables measured in this study can be seen in Table 9. From the structural model and correlation value information can be obtained about the magnitude of the direct and indirect effects of a variable. Based on the path coefficient value in Table 4 supply Chain integration has a positive relationship to the competitive advantage of 43%. Information technology for competitive advantage has a relationship rate of 16.8%.

Evaluation of R^2 (R^2): After testing the validity of the outer model then testing structural models. Structural model testing is done to assess the relationship between latent variables in the model, looking at the value of R-Square. R-Square values obtained from calculations using the help of SmartPLS. Results can be seen from the Table 10.

In accordance with the measurement criteria of the model as stated by Chin about good, moderate or weak models, the Rsquare value of 0.302 and 0.287 indicates that the structure built in this study is moderate.

The value of R^2 in the table above, can be explained that the construct variability of the value of competitive advantage in small businesses in the food and beverage sector at 30.2% can be explained by the variable Integration of the supply chain and information technology while the remaining 69.8 can be explained by other variables outside the factor factors studied. Table 11 shows the effect size of the model in this study. The results show that the high influence of each variable has a large influence.

CONCLUSION

Supply chain integration in the food and beverage SMEs in Cimahi city consists of eight sub-variables, namely customer relations information exchange through networks, use of computerized systems, market information sharing information sharing on product availability, order management processes, customer complaint levels and satisfaction evaluation customer. Categorized supply chain integration Good enough, even though market information sharing and information acquisition are categorized as good. Information technology consists of three sub-variables where the sub-variables of the HR device are still categorized sufficient while the sub-variables of the technical devices and the information and knowledge devices are categorized well.

Competitive advantages measured by four sub-variables, namely consumer response, cost, quality and categorized delivery are quite good. Information technology can be measured by three sub-variables while supply chain integration is measured by eight sub-variables.

RECOMMENDATIONS

Competitive advantage can be measured by all sub-variables. The model of the influence of information technology and supply chain integration on competitive advantage can be used so that. There is a significant influence of supply chain coordination and integration on competitive advantage in the food and beverage SMEs in Cimahi city.

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