

The Analysis of Information and Communication Technology, Supply Chain Management, Competitive Advantage, and SMEs Performance

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Submission date: 28-Apr-2023 09:05PM (UTC+0700)

Submission ID: 2078275673

File name: Technology,_SCM,_Competitive_advantege_and_SMEs_Performance.pdf (249.69K)

Word count: 4796

Character count: 29040

The Analysis of Information and Communication Technology, Supply Chain Management, Competitive Advantage, and SMEs Performance

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ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE

Nafisa, U.L., Liestyana, Y., Utami, Y., Wahyuningsih, T., Satmoko, A., & Tugiyono. (2023). The Analysis of Information and Communication Technology, Supply Chain Management, Competitive Advantage, and SMEs Performance. *Journal of International Conference Proceedings*, 6(1), 26-36.

DOI:

<https://doi.org/10.32535/jicp.v6i1.2229>

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Received: 10 February 2023

Accepted: 20 March 2023

Published: 27 March 2023

ABSTRACT

This study analyzed the performance of SMEs influenced by information communication technology, supply chain management, and competitive advantage. The researcher selected the bakpia-producing SMEs in Sleman Regency as the population in this study. This research analyzed the data collected from the questionnaires using SEM (Structural Equation Modeling) analysis method using the SmartPLS v.3.2.7 software. The results of this study show that not all hypotheses are accepted. The first hypothesis is accepted where supply chain management positively affects competitive advantage. Supply chain management also affects SME performance positively; thus, the second hypothesis is accepted. Meanwhile, the third hypothesis is accepted, where information communication technology positively affects supply chain management. Two hypotheses are not accepted. The first is the fourth hypothesis: information and communication technology do not affect competitive advantage. The second is the fifth hypothesis: competitive advantage does not affect SME performance. The research team suggests bakpia-producing SMEs to improve information and communication technology and supply chain management practices.

Keywords: Competitive Advantage, Information and Communication Technology, Sleman Regency, SMEs Performance, Supply Chain Management Practices.

INTRODUCTION

Indonesia's increasingly rapid economic development has made competition between companies increasingly fierce. According to Afonso & Cabrita (2012), the current competition is between the country and companies from various countries. Companies must be able to satisfy their customers, for example, by providing better quality products, lower prices, faster product delivery and better service than their competitors.

According to Kotler, Keller, and Chernev (2021), the best way to differentiate a company from other companies in today's competition is to see if they can consistently provide the best quality service, better than competing companies. The method is to provide excellent service with more or at least the same quality as previous consumer expectations. Service quality plays a significant role in the company's success and is the primary key to gaining the company's competitiveness.

The company's performance is also strongly influenced by the quality of its human resources. In an era of increasingly fierce competition and environmental changes, including information technology, it certainly requires good-quality human resources to adapt to these changes. Good company performance will affect the country's economic growth. With the company's performance increasing, the country's gross domestic product growth will automatically increase (Kotler et al., 2021).

According to Kotler et al. (2021), competitive advantage is an advantage over competitors that is gained by delivering more excellent customer value through lower prices or by providing more benefits corresponding to higher pricing. Strategy excellence in three categories namely cost advantage, differentiation and focus. Cost advantage is how a company sets the lowest price compared to its competitors but still does not detract from its product or service quality. Differentiation is how companies can create products or services different from their competitors. Day and Wensley (1998) argue that competitive advantage should be viewed as a dynamic process rather than a result.

According to Russell and Taylor (2019), supply chain management manages the flow of information through the supply chain to achieve a level of synchronization that will make the response to consumer desires more responsive and simultaneously reduce costs. Suhong (2006) supply chain management is the integration of business processes between interconnected networks of suppliers, manufacturers, distribution centers, and retailers to improve the flow of goods, services, and information from suppliers to end customers to reduce system-wide costs and while maintaining service levels. As stated by Liestyana, Oetomo, Wahyuningsih, and Ariyanto (2022), the need for information from various parties in supply chain management is essential for a company. Moreover, supply chain management includes all movement and storage of raw materials, stock, processing, and goods from the point of production to the point of consumption.

Due to the technical advancements of the fourth industrial revolution, 4.0, digital marketing for small and medium-sized enterprises (SMEs) must be more innovative, efficient, and sensitive to client needs. The rapid evolution of information and communication technologies profoundly impacts the business sector. Some of these technological advancements are called digital disruptions or digital disruptions. Due to change, the rate of digital advancement in the business sector is relatively swift. Media may increase visibility, bolster brand image, and attract new customers. A digital marketing approach facilitates consumer access to product information, such as price, brand, quality, and size.

Ibrahim's (2012) research indicated the practical implications of supply chain management, such as integration, information exchange, customer management, supply management, and supply chain performance responses. Thus, it is necessary to directly measure the influence of a practical supply chain management method's influence on a company's performance and competitive advantage.

Small and Medium Enterprises (SMEs) considerably advance the Indonesian economy (Susilo, 2015). Aside from being an alternative for new jobs, SMEs also drove the economic growth rate after the 1997 monetary crisis when large companies experienced difficulties in developing their businesses. Yogyakarta Special Region is one of the tourist provinces in Indonesia, which has a unique attraction for domestic and foreign tourists, especially Sleman Regency. Sleman Regency is also famous for its many varied culinary delights. Culinary is closely related to processed food and beverages, both traditional and international. However, some of the existing culinary delights are expected to have different characters so that they can become an attraction for tourists.

The company's success in today's global competition is heavily influenced by the ability to utilize technology, information and communication. Every company activity is inseparable from the use of ICT. Information and Communication Technology, abbreviated as ICT, are all technologies related to information handling. In English, ICT is called Information and Communication Technology (ICT). According to the Big Indonesian Dictionary, technology is a scientific method to achieve practical goals or applied science. It can also be interpreted as the whole and comfort of human life. It can be interpreted as news between two or more people so that the intended message can be understood. In conclusion, ICT is technology related to the retrieval, collection, processing, storage, dissemination, and presentation of information.

LITERATURE REVIEW

SMEs Performance

Aribawa (2016) wrote that SME performance is the result of work achieved by an individual and can be completed by the individual's tasks within the company and for a certain period, and will be linked to the value or standard of the company the individual works. The performance here itself is the achievement that will be obtained by a person or company that will achieve a specific goal. According to Aribawa (2016), performance is the success of an organization that realizes strategic goals and has been previously set with the behavior that an organization expects. If an SME performs well, it will be more vital to become the backbone of the economy and will play an increasingly important role in the Indonesian economy.

SMEs in developing countries, such as Indonesia, are often associated with domestic economic and social problems such as high poverty levels, large numbers of the unemployed, unequal income distribution, uneven development processes between urban and rural areas, and urbanization problems. For the development of SMEs, it is hoped that they can significantly contribute to efforts to overcome these problems. SMEs in Indonesia have an essential role in support for the economy. The SME sector is the primary driver of Indonesia's economy so far.

Competitive Advantage

According to Hajar & Sukaatmadja (2016), competitive advantage is a strategy to be superior to competitors. Competitive advantage is an added value that can attract attention and purchase intention from consumers. This competitive advantage can take any form. The more different and valuable to consumers, the better.

Suhong et al. (2000) wrote that "competitive advantage is an advantage gained through the implementation of a competitive strategy that aims to build a profitable and sustainable position against market forces that determine industry competition to design market offerings that deliver more value than competitors trying to win the same market". Competitive advantage stems from a company's ability to leverage its internal strengths to respond to external environmental opportunities while avoiding external threats and internal weaknesses.

Supply Chain Management

Russell et al. (2019) stated that supply chain management manages the flow of information that enters through the supply chain (supply chain) to achieve a level of synchronization that will make the response to consumer desires more responsive and, at the same time, lower costs. Supply chain management is the process of planning, implementing and controlling the supply chain operations to meet customer needs as efficiently as possible.

According to Suhong et al. (2006), supply chain management is the integration of business processes between interconnected networks of suppliers, manufacturers, distribution centers, and retailers to improve the flow of goods, services, and information from suppliers to end customers, to reduce system-wide costs and while maintaining service levels.

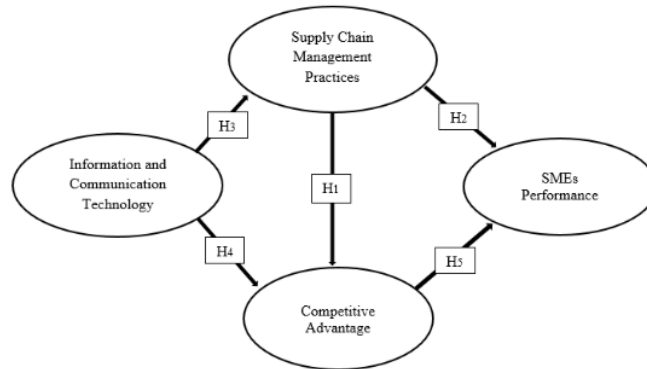
Information and Communication Technology

Information technology includes all matters relating to data manipulation and information management. Communication technology includes conveying or sending information from the sender to the recipient. From the notion of information technology and communication technology, the two technologies are inseparable equivalent technologies, meaning that the two technologies are closely related to one another. Information and communication technology are all activities related to manipulating, managing, and transferring information from sender to receiver. Information and communication technology (ICT)-based media in education connects to the demands of 21st-century learning. Hsu, Chang, and Chen (2012) stated that Information and Communication Technology (ICT) is not limited to how to operate a computer, but how to use technology to collaborate, communicate, conduct research, and solve various problems in an increasingly complex and dynamically developing learning process.

Theoretical Framework and Hypotheses

The theoretical framework explains that the dependent variables used in this study are SMEs performance and competitive advantage, while the independent variables are supply chain management and information communication technology. This framework can show that supply chain management and information communication technology influence the dependent variable, namely SME performance and competitive advantage.

Figure 1. Theoretical Framework



Sinaga Anggraeni, and Slamet (2021) discovered that implementing supply chain management practices, particularly in strategic partnerships with suppliers, the quality of information, delay, and forecasting, would increase competitive advantage in price capability, product innovation, and market responsiveness. Sukati, Hamid, Baharun, Tat, and Said (2011) found the link between supply chain management practices and achieving a substantial competitive advantage. Supply chain management strategies can create a competitive advantage through the potential to reduce prices, improve quality, and expedite delivery (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). Li et al. (2006) found in the same study that the influence of supply chain management methods had a beneficial effect on business performance. This study will investigate if SCM procedures impact the competitive advantage of bakpia-producing SMEs.

H₁: Supply chain management practices positively affect competitive advantage.

H₂: Supply chain management practices positively affect SMEs' performance

Sinaga et al. (2021) reported that ICT positively impacts supply chain management techniques. They proved that the more effectively SMEs employ ICT, the better their supply chain management will be. According to the findings of Apulu and Latham (2011) and Kushwaha (2011), implementing ICT will enable SME service enhancements and competitive advantages. Tripathy, Aich, Chakraborty, and Lee (2016) indicate that adopting ICTs impacts businesses' competitive advantage and supply chain management. Sinaga et al. (2021) also found that the capacity of information, transactions, interaction, and customization significantly influenced competitive advantage regarding product quality, product innovation, and market responsiveness.

H₃: Information and communication technology positively affects supply chain management practices.

H₄: Information and communication technology positively affects competitive advantage.

Sinaga et al. (2021) discovered that competitive advantages in terms of product quality, product innovation, and market responsiveness could positively affect firm performance, notably market share, which includes target market expansion and product introduction at the correct time. Also, a competitive advantage strategy enhanced sales growth and profit margins. In the overall competitive position, competitive advantage improved the ability to meet production costs, sell products to consumer desires and demands, and securely provide zero-defect products to customers. A company's competitive advantage demonstrates its advantage over its competitors. The more a company's competitive edge, the more it will influence its success. A corporation will offer high-priced, high-quality goods while boosting its profit margin and return on investment (Li et al., 2006).

H₅: Competitive advantage positively affects SMEs performance.

RESEARCH METHOD

Population and Sample

According to Sekaran (2010), the population is all groups of people, events, and interesting things that researchers investigate, defined as a generalization area consisting of objects and subjects that have certain qualities and characteristics set by researchers to study and then draw conclusions. The population in this study is 48 bakpia-producing SMEs in Sleman Regency, Yogyakarta Special Region. In this study, the researcher used a saturated sample or census as a sampling technique, meaning that all population members become samples. The researchers can ensure that all samples in this study have implemented ICT and SCM practices.

Research Data

This study uses primary data with questionnaires to collect the data. The questionnaire is distributed directly to the manager/owner of the bakpia-producing SMEs in Sleman Regency, Yogyakarta Special Region. The questionnaire contains the variables studied.

Research Variables

The variables analyzed in this study are supply chain management, information and communication technology, competitive advantage, and SME performance.

Supply Chain Management

Supply chain management indicators, according to Sinaga et al. (2021), are as follows:

- a. Strategic supplier partnership. Partnership relations emphasize long-term relationships and encourage joint planning to resolve supply issues.
- b. Customer relationship. Establishing relationships with customers is very important, and this can improve product quality and customer satisfaction for the product to be received.
- c. Information sharing. Information sharing refers to the extent to which an essential quantity of information can be conveyed to customers.
- d. Information quality. The quality of information refers to the accuracy, timeliness, adequacy, and credibility of the information conveyed.
- e. Postponement. delays can be made when demand is unsatisfactory or requests are too small.
- f. Warehousing management. Warehouses are used to store products with the consideration of storage costs. Much inventory will undoubtedly cost a lot.
- g. Forecasting. Companies can use forecasting strategies for the uncertainty of information requests by customers.

Information and Communication Technology

Information and communication technology (ICT) indicators, according to Sinaga et al. (2021), are as follows:

- a. Information, submit or obtain information about the condition of the company.
- b. The transaction, customer convenience in choosing products, to customer data security.
- c. Interaction and customization, interact with consumers or customers regarding improvements or discuss customer desires.

SMEs Performance

SMEs performance variables are measured using SMEs performance indicators (Sinaga et al., 2021) as follows:

- a. Market share is the company's ability to achieve market share growth.
- b. Return on investment, the company's ability to achieve a return on investment.

- c. Sales growth is the company's ability to achieve sales growth.
- d. The profit margin on sales, the company's ability to achieve profits.
- e. Overall competitive position, the company's ability to achieve overall competition.

Competitive Advantage

This variable was measured using competitive advantage indicators (Sinaga et al., 2021) as follows:

- a. Price can be interpreted as an economic sacrifice customers make to benefit from using goods or services.
- b. Delivery, the ability to reduce time in the delivery process, can be a source of competitive advantage for companies.
- c. Product innovation is the company's ability to attract consumer interest and introduce product uses that are right on target.
- d. Product quality is the main focus of the company. Quality is an essential policy in increasing a product's competitiveness.
- e. Time to market, the company can introduce or launch new products more quickly than competitors.

Data Analysis Techniques

The research tested the hypothesis using a Structural Equation Model (SEM) approach based on Partial Least Square (PLS). The result of the analysis is presented below.

RESULTS

The research concerns 48 bakpia-producing SMEs in Sleman Regency, Yogyakarta Special Region. The results are presented in two sections: the outer and inner models.

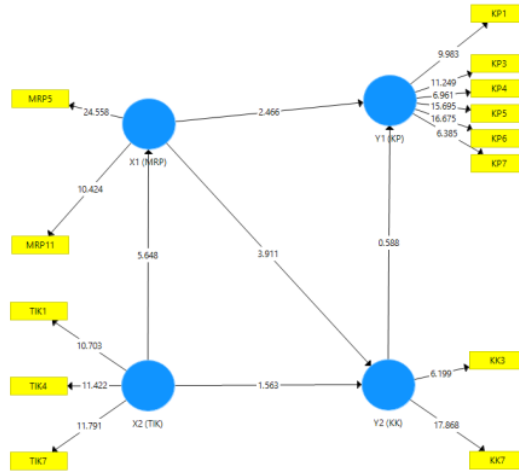
Model Measurement (The Outer Model)

According to Ghozali (2016), the outer model measures the relationship between indicators and constructs. This model aims to test the construct validity and reliability of the research instruments. This study measures the validity test using convergent validity, discriminant validity, and average variance extracted (AVE). The reliability test uses composite reliability and Cronbach's Alpha. Model measurement results from all items are valid, and all variables are reliable.

Structural Models (The Inner Model)

According to Ghozali (2016), the outer model measures the relationship between indicators and constructs. This model aims to test the construct validity and reliability of the research instruments. It measures the validity test using convergent validity, discriminant validity, and average variance extracted (AVE). The reliability test uses composite reliability and Cronbach's Alpha. Model measurement results from all items are valid, and all variables are reliable.

Figure 2. Bootstrapping Results



Bootstrapping results (the direct effect) in Table 1 shows that three hypotheses are accepted, namely: hypotheses 1 (one), 2 (two), and 3 (three), and two other hypotheses are rejected, namely: hypotheses 4 (four), and 5 (five).

Table 1. Direct Effects

	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	T Statistics (IO/STDEVI)	P Values
SCM -> CA	0.505	0.487	0.125	4.030	0.000
SCM -> PERF	0.427	0.439	0.167	2.565	0.011
ICT -> SCM	0.549	0.563	0.101	5.434	0.000
ICT -> CA	0.202	0.214	0.130	1.551	0.121
CA -> PERF	0.119	0.133	0.205	0.578	0.563

Based on Table 1, the determination of whether the hypothesis is accepted or rejected is explained as follows:

1. The test results in Table 1 show that the supply chain management variable is significant to the competitive advantage variable with a value of statistics of 4.030 and a p-value of 0.00. The original sample value is 0.505, meaning supply chain management positively influences competitive advantage. Thus, hypothesis 1 in this study is accepted.
2. The test results in Table 1 show that supply chain management variables are significant to SME performance variables, with a statistical value of 2.565 and a p-value of 0.01. The original sample value is 0.427, meaning supply chain management positively influences SME performance. Thus, hypothesis 2 in this study is accepted.
3. The test results presented in Table 1 show that the information and communication technology variable is significant to the supply chain management variable with a statistical value of 5.434 and a p-value of 0.00. The original sample value is 0.549,

meaning that information and communication technology positively influences supply chain management. Thus, hypothesis 3 in this study is accepted.

4. The test results presented in Table 1 show that the information and communication technology variable is not significant to the competitive advantage variable, with a statistical value of 1.551 and a p-value of 0.11. The original sample value is 0.202, meaning that information and communication technology do not positively affect competitive advantage. Thus, hypothesis 4 in this study is not accepted.
5. The test results presented in Table 1 show that the competitive advantage variable is not significant to the SME performance variable, with a statistical value of 0.578 and a p-value of 0.55. The original sample value is 0.119, meaning that information and communication technology do not positively affect competitive advantage. Thus, hypothesis 5 in this study is not accepted.

DISCUSSION

Effect of Supply Chain Management on Competitive Advantage

Supply chain management influences competitive advantage positively. It implies that improved supply chain management implementation can increase competitive advantage. Businesses manufacturing Bakpia in Sleman Regency employ supply chain management by keeping positive connections with their suppliers. They will increase their competitive advantage by expanding their bargaining power, obtaining cheaper production inputs, and producing cheaper and more competitive products than their competitors.

The implementation of supply chain management has a substantial impact on competitive advantage. Thus, the higher the level of supply chain management, the greater the competitive advantage. The findings of this study support prior research by Sinaga et al. (2021), which found that supply chain management favorably improves competitive advantage.

The Influence of Supply Chain Management on SME Performance.

Supply chain management improves the performance of SMEs. This fact indicates that the supply chain management level directly affects SME performance. Bakpia-producing SMEs in Sleman Regency has developed supply chain management focusing on customer satisfaction. They determined what customers want so that small and medium-sized enterprises (SMEs) can accomplish corporate performance by supplying items that align with client perceptions and cover the entire market. This study's findings corroborate previous findings by Hwihanus et al. (2021) that supply chain management has a favorable impact on SME performance.

The Influence of Information and Communication Technology on Supply Chain Management

The information and communication technology variable positively influenced supply chain management. So the higher the information communication technology, the better the supply chain management. Bakpia-producing SMEs in Sleman Regency have implemented information and communication technology essential in supporting supply chain management from the earliest consumer to the ultimate consumer. Supply chain management emphasizes long-term benefits for all companies involved in the supply chain through collaboration and information sharing. This result demonstrates the significance of information and communication technologies in supply chain management. According to prior research by Sinaga et al. (2021), information and communication technology positively impacts supply chain management.

The Influence of Information and Communication Technology on Competitive Advantage

The information and communication technology variable did not affect competitive advantage. Improved information and communication technology do not necessarily increase its competitive advantage. In the research of Sinaga et al. (2021), food processing SMEs proved that information, transaction, and interaction capabilities positively affected competitive advantage. In this research, bakpia-producing SMEs indicated that SMEs had provided product and price information to customers and the market well. However, shipping parties from SMEs often need to deliver goods on time to their consumers. So the results of this study do not support the research conducted by Sinaga et al. (2021).

The Effect of Competitive Advantage on SME Performance

The competitive advantage variable did not affect SME performance. Increased competitive advantage does not necessarily increase SME performance. Sinaga et al. (2021) found that the competitive advantage of food processing SMEs is the ability to offer products according to customer wants and needs and deliver products to customers safely (without defects). While in bakpia-producing SMEs, the aim is that SMEs have also provided products according to customer wants and needs appropriately.

CONCLUSION

The study's conclusions are that supply chain management positively affects competitive advantage in bakpia-producing SMEs. Supply chain management positively affects SME performance in bakpia-producing SMEs. Information and communication technology positively affect supply chain management in bakpia-producing SMEs. Information and communication technology does not affect the competitive advantage of bakpia-producing SMEs. Competitive advantage does not affect SME performance in bakpia-producing SMEs.

ACKNOWLEDGMENT

N/A

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest

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