



**INFORMATION TECHNOLOGY CAPABILITIES AND INNOVATION CAPACITIES INCREASING WITH COMPETITIVE ADVANTAGE**

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This study aims to examine the effect of information technology capability and innovation capability on culinary UMKM competitive advantage with strategy as an intervening variable. This research was conducted in the city of Semarang. The sampling technique used purposive sampling method. The research data is primary data collected by distributing questionnaires to UMKM owners in the culinary field in Semarang City with a sample of 96 respondents. Hypothesis testing is done using the Path Analysis method. Based on statistical tests, the results show that information technology capability has a significant effect on strategy, innovation capability has a significant effect on strategy, information technology capability has a significant effect on competitive advantage. Innovation capability has a significant effect on competitive advantage, and Strategy has a significant effect on competitive advantage. Micro, small and medium businesses in the culinary field It is suggested to be able to continue to increase the use of information technology in order support business activities and improve the ability to create innovation in product without losing the original product.

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**INTRODUCTION**

UMKM empowerment is currently not only carried out by the central government, but also local governments, both at the provincial and city levels. Central Java as one of the provinces with the third largest population in Indonesia certainly has a good opportunity to grow UMKM. In addition, the location of Central Java Province, which is in the middle of Java Island, also has good opportunities in the economy and marketing of UMKM products, considering that many people will stop in Central Java Province and buy UMKM products. Various efforts have been made by the government to grow UMKM actors in society.

The development of the number of UMKM in the city of Semarang is quite high from year to year. In 2022, the progress increased to 7,369 from the previous year. We can see the increase in the number of UMKM actors in Semarang City in Table

Table 1. Number of UMKM in Semarang City (unit)

Year	Number of UMKM (unit)	%
2016	99.98	-
2017	11.054	10.56
2018	14.893	34.72
2019	17.567	17.95
2020	17.913	1.97
2021	22.242	24.16
2022	29.611	33.13

Table 1 above shows that from 2016 to 2022 the number of UMKM developments in the city of Semarang has increased which has led to increased competition among UMKM in

attracting people to shop. In the intense competition, every UMKM in the city of Semarang are required to compete with each other to be able to maintain their business. UMKM are required to be able to always optimize their existing potential to increase their competitive advantage, because UMKM will always be faced with competition. companies need to make a strategy for their position and build a competitive advantage (Competitive Advantage (Fahlefi & Indriani, 2021). develop behavior that entrepreneurial orientation is very important to determine the right competitive strategy so the company can improve its marketing capabilities and later will improve marketing performance company(Wahyu Yanuarti & Murwatiningsih, 2019)

UMKM are growing rapidly in Indonesia, ideas emerge thanks to an innovation that can be a force for companies to strengthen their market position. The attitude of a business actor as an adherent of innovation is how to view changes that are not only for now or today but also changes for tomorrow so that they can start preparing or anticipating the dynamics of market competition (Urbancova, 2013). Innovation can also be created as companies see that many competitors have emerged so that companies are able to combine the advantages of competitors to become a new advantage for the company (Ofori & Ato-Mensah, 2015). The impact of innovation also contributes to the creation of useful characters to make it easier to remember and influences the increase in company profits, where profit plays a role in the welfare of all elements of the company (Waheed et al., 2013)

Innovation in relation to small and medium business actors needs to apply the role of information technology in their business, this is done because of the influence of globalization on the rapid development of information as a form of new knowledge. Information technology is also useful in terms of accelerating the production process and marketing products in other ways such as online sales (Setyawati 2014), not only that the company is also helped by the impact of the company's existence in competition in similar markets (Aslizadeh, 2014)Competitors make companies use information technology to penetrate markets to business competitors by means of differentiating business results (Cakmak & Tas, 2012) Information technology makes it easy for consumers or potential customers to be able to access information wherever and whenever, other benefits are also obtained when companies can monitor any changes or strategies made by similar business actors to their companies (Chukwunonso et al., 2011)). Besides being able to be used by companies to monitor competitors' activities, information technology can also function as additional information to companies about what good things the company has not done to increase its competitiveness in the market. This is usually done by companies in developing countries where they monitor innovations made by companies in developed countries in adding selling value to their products (Lew et al., 2013)The essence of the information technology function is to create efficiency to reduce waste by companies (Moghavvemi et al., 2014)

The competitive advantage that has been achieved by the company should be maintained because with the existence of an advantage more and more competitors pay attention to the company's negligence, therefore the company must continue to be consistent in maintaining its superiority (Russell & Millar, 2014). Competitive advantage can also be seen through customer evaluation that can be created by the company through service facilities that can accommodate all kinds of complaints or suggestions aimed at consumers for companies for improvement towards higher quality. Setting a good strategy is the key to success for companies to be at the forefront of anticipation in market competition (Tarabieh, 2015)

This research was conducted on Culinary UMKM in the city of Semarang. The reason for this research was conducted on culinary UMKM in the city of Semarang due to a decrease in the growth rate of culinary UMKM actors which was revealed through data obtained in 2016-2022. Data on the number of UMKM in the culinary field of Semarang City can be seen in Table 2 as follows:

Table 2. Number of UMKM actors in the culinary field in Semarang City (unit)

Year	
2016	1.864
2017	3.436
2018	4.648
2019	5.575
2020	5.750
2021	7.392
2022	3.031

Several previous studies, according to (Syahrial Manaf et al., 2020); (Putu Yadnya & Wayan Santika, 2017); (Cakmak & Tas, 2012) revealed that information technology and innovation have a significant effect on competitive advantage. However, previous research conducted by (Minoja et al., 2010); (Adietya et al., 2015) shows that innovation has no positive and significant effect on competitive advantage. This research tries to overcome this gap, namely whether information technology capabilities and innovation capabilities have an influence on the competitive advantage of CulinaryUMKM.

THEORETICAL FRAMEWORK

Competitive Advantage

According to Kotler & Armstrong (2012) competitive advantage is an advantage over competitors obtained by delivering greater customer value, through lower prices or by providing more benefits in accordance with higher pricing. Competitive advantage becomes very important when a company enters a highly

competitive market, short-term and even long-term success will be determined by the company's ability to build a strong business for a sustainable competitive advantage that is better than that of its competitors in the market it serves (Ferdinand, 1998). According to Porter, 1980 competitive advantage basically develops from the value that a company is able to create for its customers, provided that value exceeds the company's costs in creating the value created. Companies that can maintain above average performance in their industry or in other words companies can create value, for example through the services that have been provided to its customers, will achieve a competitive advantage (Hendrayanti & Junaidi, 2022). This variable has 4 indicators: Price, Product Innovation, Quality, Delivery dependability.

### **Innovation Capability**

According to (Sok, P., O'Cass, A., & Sok, 2013) innovation capability has indicators that are able to improve the quality of existing products, able to develop new products and utilize the latest technology. This variable has 2 indicators: Increase product quality There is, Develop the new product unique.

### **Information Technology Capability**

According to (Zhang et al., 2008) information technology capability is an ability information technology as the company's ability to mobilize and deploy resources based on information technology in combination or in combination with other resources and capabilities. (Saunders & Brynjolfsson, 2016) say information technology capabilities are based on how capabilities management and human resource capabilities facilitate technology investment information, how information technology is used in internal and with communications suppliers, and company internet capabilities. This variable has 3 indicators: Infrastructure, Resources Man, Ability managerial

### **Strategy**

According to (Hunger et al., 2001) strategy is a goal that is taken before taking an action, and shows a shared understanding of the company's vision and mission. Strategy can start with the concept of how to use and implement company resources effectively and efficiently within the company's environment both internally and externally. This variable has 2 indicators: Consider internal environment UMKM, Pay attention external environment UMKM.

### **Hypotheses Development**

#### **The Relationship of Information Technology Capability to Strategy of Culinary UMKM**

Information Technology capability is closely related to business strategy. Information Technology will be a driving force for business development. The higher the Information Technology capability of a business, the faster it

will be in developing strategies to achieve the final goal. Strategy will maximize competitive advantage and minimize competitive limitations

#### **The Relationship of Innovation Capability to Strategy of Culinary UMKM**

Every Culinary UMKM owner is required to be able to understand and understand everything that is happening in the market and various changes that occur in the business environment so that they are able to compete with other competitors. For culinary small and medium micro businesses, their success in carrying out innovation capabilities can mean that the business owner has one step ahead compared to his competitors.

The higher the innovation capability of a business, the faster it will be in developing strategies to achieve the final goal, because strategy is an action taken by business actors in formulating steps to achieve development goals and business excellence.

#### **The Relationship of Information Technology Capability to the Competitive Advantage of Culinary UMKM**

Information technology capability in Culinary UMKM is believed to be the key to success in carrying out digital transformation when managing a business so that it makes it easier for consumers and increases consumer confidence in shopping. The higher the level of consumer confidence in transactions will lead to competition between Culinary UMKM. According to research conducted by (Adietya et al., 2015) stated that adequate information technology will increase the competitive advantage of UMKM. In accordance with research conducted by (Hsu, 2014) who conducted research on companies in Taiwan, the results showed that there was a significant positive influence between information technology capabilities and organizational performance. Good information technology capabilities will increase the company's competitive advantage and will help companies to streamline costs incurred.

#### **The Relationship of Innovation Capability to Competitive Advantage of Culinary UMKM**

Innovation capability can be used as a strategy in achieving competitive advantage. Consumers generally want innovative products according to their wishes. Every Culinary UMKM owner is required to be able to understand and understand everything that is happening in the market and various changes that occur in the business environment so that they are able to compete with other competitors. For culinary small and medium micro businesses, their success in carrying out innovation capabilities can mean that the business owner has one step ahead compared to his competitors. Business actors are required to be able to apply the right strategy so that it can be used in facing competition. In accordance with research conducted by (Martin et al., 2017) and (Suhaeni,

2018) which reveal that strategies in innovation capability have an important influence so that companies are able to achieve competitive advantage.

**The Relationship of Strategy to the Competitive Advantage of Culinary UMKM**

In a competition, every business actor competes in creating and implementing the best strategy in facing intense competition to attract consumers. According to research conducted by (Zhu & Nakata, 2007)

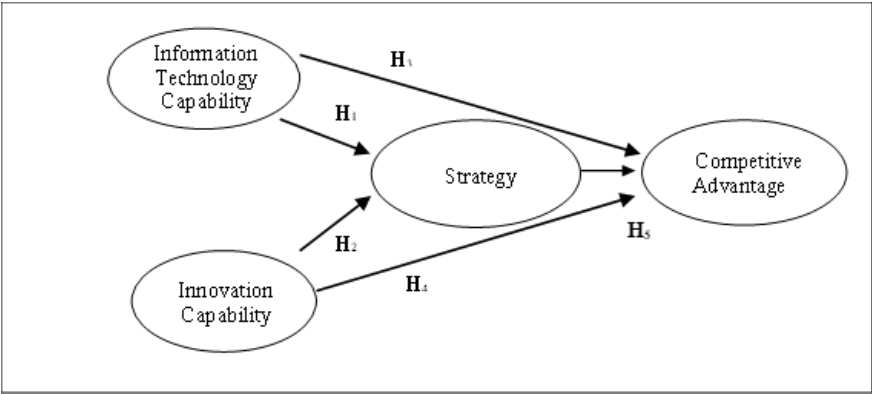


Figure 1. Research Model

**METHOD**

**A. Population**

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then draw conclusions. The population in this study are all culinary UMKM in the city of Semarang whose number is unknown or unlimited.

**B. Sample**

The sample is part of the population that has relatively the same characteristics: considered representative of the population (Singarimbun, 1991). According to Indriantoro and Sutomo (1999) the sample is part of the intended population to be studied. In this study, the number of population members is not known with certainty, so the sample size is calculated using the Cochran formula (Sugiyono, 2008)

$$n = \frac{z^2pq}{e^2}$$
$$n = \frac{(1.96)^2 (0.5)(0.5)}{(0.10)^2}$$
$$n = 95.04 = 96 \text{ respondent}$$

Information:

n= sample

z= price in the normal curve for a 5% deviation, with a value of 1.96

p= 50% chance of being right = 0.5

q= 50% chance of being wrong = 0.5 e= 10% margin of error

**C. Method Analysis**

In this study, researchers used a non-probability sampling technique in which convenience sampling was carried out. The definition of convenience sampling according to Sekaran (2006) is "convenience sampling reverses to the collection of the information from members of the population who are conveniently available to provide it". So convenience sampling is a collection of information from members of the population that is easy to obtain and is able to provide that information. Thus anyone who can provide information either accidentally or by chance meets the researcher, can be used as a sample, if it is seen that the person who provided the information is suitable as a data source (Sekaran, 2006).

In this study, the analytical method used is the path analysis method. Path analysis aims to identify the path that causes a certain variable to other variables it influences (Sarwono, 2012). In this research path analysis, two types of regression were used. The two types of regression are described below:

$$Y = \alpha + b_1X_1 + b_2X_2$$
$$Z = \alpha + b_1X_1 + b_2X_2 + b_3Y$$

Information:

- α: Constant
- b<sub>1</sub>,b<sub>2</sub>,b<sub>3</sub>: regression coefficient
- X<sub>1</sub>: Information Technology Capability
- X<sub>2</sub>: Innovation Capability
- Y: Strategy
- Z: Competitive Advantage

**RESULT AND DISCUSSION**

**1. Path Analysis**

For path analysis, it will be shown by dividing the test into 2 path coefficients, path model 1 and model 2

Table 3. Path Analysis Model 1  
Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.240	1.916		2.213	.029
	Information Technology Capability	.147	.066	.203	2.223	.029
	Innovation Capability	.505	.096	.479	5.257	.000

Table 4. Path Analysis Model 2  
Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.296	1.749		-.741	.460
	Information Technology Capability	.133	.060	.176	2.207	.030
	Innovation Capability	.368	.097	.335	3.778	.000
	Strategy	.396	.092	.380	4.297	.000

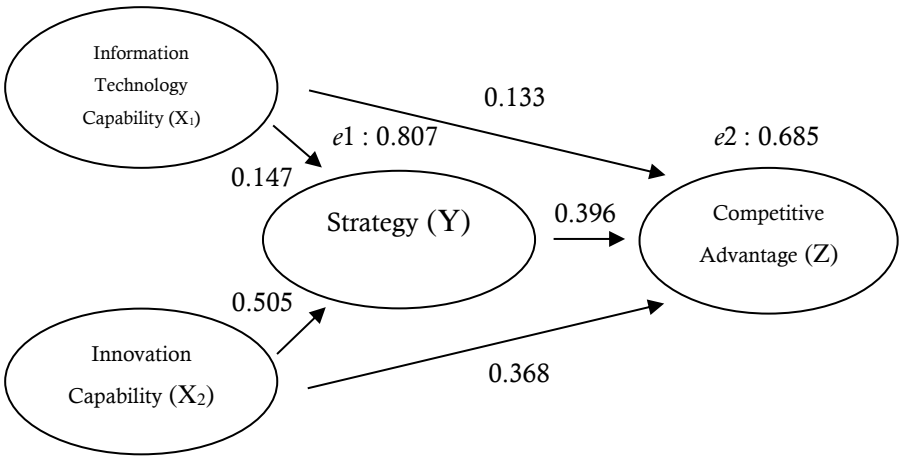


Figure 2. Result Path Analysis

Table 5. Sobel Test. Effect of Information Technology Capability on Competitive Advantage with Strategy as a Moderating Variable

Variabel	Standardized Coefficients	Unstandardized Coefficients	Std. Error	Sig < 0.05
X <sub>1</sub> → Y	0.203	0.147	0.066	0.029
Y → Z	0.380	0.396	0.092	0.000

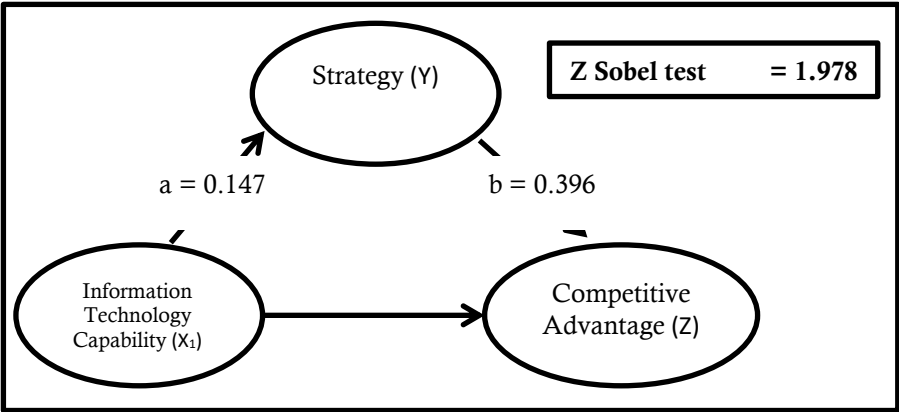


Figure 3. Sobel Test. Effect of Information Technology Capability on Competitive Advantage with Strategy as a Moderating Variable

Table 6. Sobel Test. Effect of Innovation Capability on Competitive Advantage with Strategy as a Moderating Variable

Variabel	Standardized Coefficients	Unstandardized Coefficients	Std. Error	Sig < 0.05
$X_2 \rightarrow Y$	0.479	0.505	0.096	0.000
$Y \rightarrow Z$	0.380	0.396	0.092	0.000

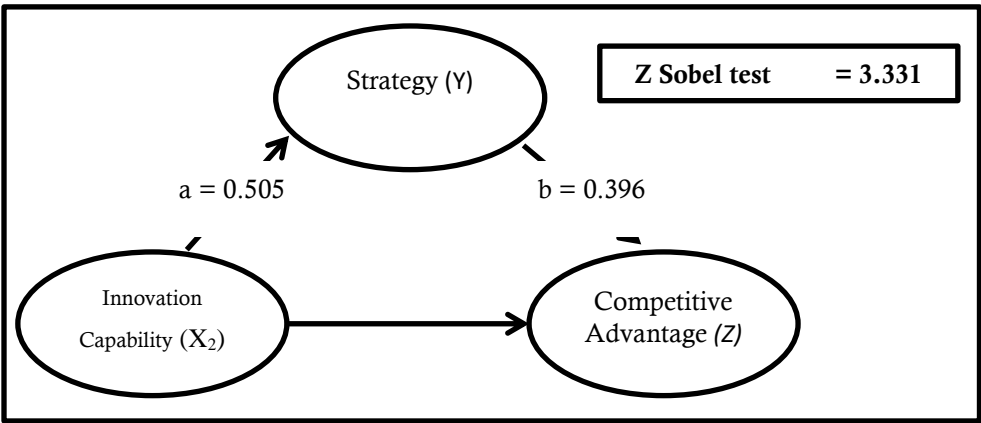


Figure 4. Sobel Test. Effect of Innovation Capability on Competitive Advantage with Strategy as a Moderating Variable

From the results of path analysis model 1, it can be seen that the Information Technology Capability variable has a coefficient of 0.147 and Innovation Capability  $y$  has a coefficient of 0.505. For the value of  $e1$  generated 0.807 ( $\sqrt{(1-0.348)}$ ). So that it can be drawn modeling path analysis model 1 can be seen below:

Strategy:  $4.240 + 0.147 X_1 + 0.505 X_2 + 0.807$

From the results of path analysis model 2, it can be seen that the Information Technology Capability variable has a coefficient of 0.133, while Innovation Capability has a coefficient of 0.368, and Strategy has a coefficient of 0.396. For the value of  $e2$  generated 0.685 ( $\sqrt{(1-0.530)}$ ). So that it can be drawn modeling path analysis model 2 can be seen below:

Competitive Advantage :  $-1.296+ 0.133 X_1+ 0.368 X_1+ 0.396 Y + 0.685$

From Figure 1 there is a direct effect between variables :

- 1.The effect of Information Technology Capability ( $X_1$ ) on Strategy ( $Y$ ) is 0.147 with a significance of  $0.029 < 0.05$ . So it can be concluded that the first hypothesis is accepted.
- 2.The effect of Innovation capability ( $X_2$ ) on Strategy ( $Y$ ) is 0.505 with a significance of  $0.000 < 0.05$ . So it can be concluded that the second hypothesis is accepted.
- 3.The effect of Information Technology Capability ( $X_1$ ) on Competitive Advantage ( $Z$ ) is 0.133 with a significance of  $0.030 < 0.05$ . So it can be concluded that the third hypothesis is accepted.
- 4.The effect of Innovation capability ( $X_2$ ) on Competitive Advantage ( $Z$ ) is 0.368 with a significance of  $0.000 < 0.05$ . So it can be concluded that the fourth hypothesis is accepted.
- 5.The effect of Strategy ( $Y$ ) on Competitive Advantage ( $Z$ ) is 0.396 with a significance of  $0.000 < 0.05$ . So it can be concluded that the fifth hypothesis is accepted.

From the table 5, the Sobel test can be shown in the equation below :

$$Z = \frac{ab}{\sqrt{(b^2SE_a^2) + (a^2SE_b^2)}}$$
$$Z = \frac{(0.147 \times 0.396)}{\sqrt{(0.396^2 \times 0.066^2) + (0.147^2 \times 0.092^2)}}$$
$$Z = \frac{0.058}{0.029}$$
$$Z = 1.978$$

Based on the results of the Sobel test, the resulting z value of the Sobel test is 1.978. This shows that the sobel z value > z score (1.96). So it can be concluded that Strategy is able to mediate the effect of Information Technology Capability on Competitive Advantage.

The indirect effect of Innovation Capability (X2) on Competitive Advantage (Z) through Strategy (Y). From the table 6, the Sobel test can be shown in the equation below :

$$Z = \frac{ab}{\sqrt{(b^2SE_a^2) + (a^2SE_b^2)}}$$
$$Z = \frac{(0.505 \times 0.396)}{\sqrt{(0.396^2 \times 0.096^2) + (0.505^2 \times 0.092^2)}}$$
$$Z = \frac{0.199}{0.060}$$
$$Z = 3.331$$

Based on the results of the Sobel test, the resulting sobel test z value of 2.01. This shows that the sobel z value > z score (1.96). So it can be concluded that Strategy is able to mediate the effect of Innovation capability on Competitive Advantage

**The Effect of Information Technology Capability on Strategy of Culinary UMKM**

The Information Technology capability regression coefficient is 0.147. The coefficient is positive, meaning that every one unit increase in the Information Technology capability variable and another variable is worth 0, it will be followed by Strategy of 0.147. The Information Technology capability variable produces a significance probability of 0.029 < 0.05, based on these results it can be concluded that Information Technology capability positive and significant effect on strategy.

Information Technology capability is closely related to business strategy. Information Technology will be a driving force for business development. The higher the Information Technology capability of a business, the faster it will be in developing strategies to achieve the final goal. Strategy will maximize competitive advantage and minimize competitive limitations.

**The Effect of Innovation Capability on Strategy of Culinary UMKM**

The Innovation capability regression coefficient is 0.505. The coefficient is positive, meaning that every increase in one unit of

Innovation capability variable and other variables is worth 0, it will be followed by Strategy of 0.505. Innovation capability variable produces a significance probability of 0.00 < 0.05, based on these results it can be concluded that Innovation capability has a positive and significant effect on Strategy.

Every Culinary UMKM owner is required to be able to understand and understand everything that is happening in the market and various changes that occur in the business environment so that they are able to compete with other competitors. For culinary small and medium micro businesses, their success in carrying out innovation capabilities can mean that the business owner has one step ahead compared to his competitors.

The higher the innovation capability of a business, the faster it will be in developing strategies to achieve the final goal, because strategy is an action taken by business actors in formulating steps to achieve development goals and business excellence.

**The Effect of Information Technology Capability on the Competitive Advantage of Culinary UMKM**

The Information Technology capability regression coefficient is 0.133. The coefficient is positive, meaning that every one unit increase in Information Technology capability variable and another variable is 0, it will be followed by competitive advantage of 0.133. The Information Technology capability variable produces a significance probability of 0.030 < 0.05, based on these results, it can be concluded that Information Technology capability has a positive and significant effect on competitive advantage.

Information technology capability in Culinary UMKM is believed to be the key to success in carrying out digital transformation when managing a business so that it makes it easier for consumers and increases consumer confidence in shopping. The higher the level of consumer confidence in transactions will lead to competition between Culinary UMKM. According to research conducted by (Adietya et al., 2015) stated that adequate information technology will increase the competitive advantage of UMKM. In accordance with research conducted by (Hsu, 2014) who conducted research on companies in Taiwan, the results showed that there was a significant positive influence between information technology capabilities and organizational performance. Good information technology capabilities will increase the company's competitive advantage and will help companies to streamline costs incurred.

**The Effect of Innovation Capability on Competitive Advantage of Culinary UMKM**

The Innovation capability regression coefficient is 0.368. The coefficient is positive, meaning that every one unit increase in information technology capabilities variable and another variable is 0, it will be followed by competitive advantage of 0.368. The Innovation capability variable produces a significance probability of 0.00 < 0.05, based on these results,

it can be concluded that Innovation capability has a positive and significant effect on competitive advantage.

Innovation capability can be used as a strategy in achieving competitive advantage. Consumers generally want innovative products according to their wishes. Every Culinary UMKM owner is required to be able to understand and understand everything that is happening in the market and various changes that occur in the business environment so that they are able to compete with other competitors. For culinary small and medium micro businesses, their success in carrying out innovation capabilities can mean that the business owner has one step ahead compared to his competitors. Business actors are required to be able to apply the right strategy so that it can be used in facing competition. In accordance with research conducted by (Martin et al., 2017) and (Suhaeni, 2018) which reveal that strategies in innovation capability have an important influence so that companies are able to achieve competitive advantage.

#### **The Effect of Strategy on the Competitive Advantage of Culinary UMKM**

The Strategy regression coefficient is 0.396. The coefficient is positive, meaning that each increase in one unit of the Strategy variable and another variable is worth 0, it will be followed by competitive advantage of 0.396. The Strategy variable produces a significance probability of  $0.00 < 0.05$ , based on these results it can be concluded that Strategy have a positive and significant effect on competitive advantage.

In a competition, every business actor competes in creating and implementing the best strategy in facing intense competition to attract consumers. According to research conducted by (Zhu & Nakata, 2007)

#### **CONCLUSION AND RECOMMENDATION**

Based on the results of the analysis and discussion described in the previous chapter, the conclusions that can be drawn from this research are information Technology capability positive and significant effect on strategy of Culinary UMKM. Innovation capability has a positive and significant effect on Strategy of Culinary UMKM. Information Technology capability has a positive and significant effect on competitive advantage of Culinary UMKM. Innovation capability has a positive and significant effect on competitive advantage of Culinary UMKM. Strategy have a positive and significant effect on competitive advantage of Culinary UMKM

Based on the research results, conclusions and limitations, several suggestions that apply to various parties include:

##### **a. For Sellers**

According to the data collected, culinary connoisseurs are included in the category namely information technology capability, innovation

capability, strategy and competitive advantage. Therefore, micro, small and medium businesses in the culinary field It is suggested to be able to continue to increase the use of information technology in order support business activities and improve the ability to create innovation in product without losing the original product.

##### **b. For Further Researchers**

Correcting the limitations in this study and increasing the number samples and data collection methods to obtain comprehensive results and determine the accuracy of the data in further research. It is hoped that further researchers to be able to add other variables to develop research.

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