

## KNOWLEDGE-SHARING MEDIATION AND ITS EFFECTS ON FIRM PERFORMANCE

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### Abstract

*Companies that want to be competitive should focus on knowledge by outlining how learning is given to experts and new people to create new knowledge to improve company performance jointly. One key innovation that is often applied to help all production and marketing processes in companies improve company performance is information technology. This study aims to analyze the mediation of knowledge sharing in the relationship between information technology and small and medium-sized industries (SMEs) performance. The sample of this study was 160 SMIs that had a turnover of 300 million – >2.5 billion and had at least ten employees at the management level. The results of this study show that knowledge sharing mediates the relationship between information technology and the performance of SMEs. Developing the concept of sharing knowledge between employees can accelerate the information technology process to improve company performance more effectively and efficiently.*

*Keywords: Information Technology, Innovation, Effective*

### 1. INTRODUCTION

The quality of its human resources primarily determines the company's success. The human component of the company has a strategic position because it is the human being who knows everything that can be the input or resources needed by the company to be managed and processed so that it can produce quality products as the company's goals. Therefore, human resources are potential resources and strategic roles in each company's division.

Small and Medium Industry is a corporate organization that has an essential meaning in supporting the national economy, especially in food and beverage SMEs, which are leading SMEs in national economic growth. However, the problem of food and beverage SMEs in general lies in human resources, especially in terms of technology, especially information technology. To deal with this, SMEs must prepare human resource management to improve performance. SMEs need to understand information technology to increase efficiency by sharing employees' knowledge or experiences, or also companies can invite someone who is an expert to provide training to their employees. Research (Mwithiga, Njihia, and Iraki, 2017) states that information technology significantly affects the company's performance. Companies with effective IT Integration can obtain superior enterprise performance. The performance of

the enterprise is achieved through the complementary development of the complex interaction between tangible (human) and intangible (information systems) IT resources. Further research on the relationship between information technology and performance was carried out by (Ilmudeen, Aboobucker, and Bao, 2018), which places information technology management as a mediating variable in the relationship between management investments and company performance. Ilmuden concluded that the company has focused on utilizing information technology management practices so that employees can more easily understand management investments that will later affect company performance. In carrying out information technology management practices, it is necessary to share knowledge between employees and company leaders so that the implementation of information technology management can be applied as well as possible.

Research results (Chae, Koh, and Prybutok, 2014) state that information technology does not affect a company's performance. It is due to poor leadership that cannot take full advantage of information technology, so the company's performance cannot improve. In essence, the high performance of the company depends on its technological capabilities of the company. However, this can happen if the company can predict and keep up with technological developments and use them to improve its products and processes; the company's high performance may not become a reality if it cannot predict and keep up with technological developments. Based on the description in the previous paragraph, there are still many studies with different conclusions or research gaps. With so many differences, this is a phenomenon that needs to be studied, and this happens because of the rapid changes in the work environment and technological developments. Therefore, to get high IKM performance to overcome problems over rapid changes in the work environment and technological developments, it is necessary to create new models to improve the performance of food and beverage SMEs. That is, by adding a concept of knowledge-sharing mediation variables as an original model in this study to analyze the indirect influence of information technology on company performance.

Knowledge-sharing mediation is based on theory (Obeidat *et al.*, 2016), which states that companies that want to survive in a dynamic and competitive environment should focus on the concept of knowledge. By describing how learning is given to experts and new people to participate in the learning process and create new knowledge, With the existence of a supportive theory about the concept of knowledge-sharing mediation variables, the idea is a solution to improve the performance of food and beverage SMEs in Surabaya.

## Literature Review

Information technology has evolved into an important strategic resource for businesses. They collect information, which is necessary for sound decision making. If an organization wants to survive and thrive in a rapidly changing business environment while competing in the global market, information technology (IT) has become a key driver in business processes. According to Thompson et al (1991), the use of information technology is the benefit expected by users of information systems in carrying out their duties, where the measurement is based on the intensity of utilization, frequency of use, and number of applications or software used.

Organizations can put in place specially designed information systems to support various aspects of knowledge management activities (Alavi and Leidner, 2001). Gerstein and Shullman (1992), who state that "perhaps the single greatest influence on organizational design

has been the evolution of information technology," emphasize the contribution of information technology and its influence on organizations. People can communicate quickly, share ideas, and transfer information thanks to information technology networks.

When an organization wants to benefit from knowledge sharing activities, it must consider information technology. Manually managing knowledge within an organization is nearly impossible due to the volume of data and the complexity of data requirements. The role of information technology will be very dominant in this regard, covering at least the needs of data acquisition and processing; knowledge dissemination; evaluation; and knowledge development. This is consistent with the findings of (Wisnuharnowo, Hermanto and Sakti, 2020), who discovered a link between information technology and knowledge sharing. This demonstrates how, with the right information technology, organizations can quickly and efficiently share knowledge. However, according to Akosile and Olatokun (2019), the given Information Technology variable has no effect on knowledge sharing. Because of differences in the use of information technology in organizations, the culture of knowledge sharing within the organization varies.

Companies must clearly consider information technology in order to improve company performance. According to Nabel and Nazri (2019), information technology has a significant impact on company performance. According to Nabel and Nazri (2019), managers should use their company's information technology capabilities to develop dynamic capabilities such as absorption capacity and company entrepreneurship, which can later improve company performance. Ilmuden and Bao (2018) conclude that companies that focus more on information technology must use information technology management practices so that employees can more easily understand information technology, which can directly affect company performance.

### ***Conceptual framework***

The relationship between information technology and performance has been done a lot. However, it has a different conclusion. This is because the company has not been able to take full advantage of information technology. Therefore, this research designed a knowledge-sharing mediation model to maximize information technology to improve effective and efficient company performance. Based on this, the conceptual framework and hypothesis can be formulated as follows:

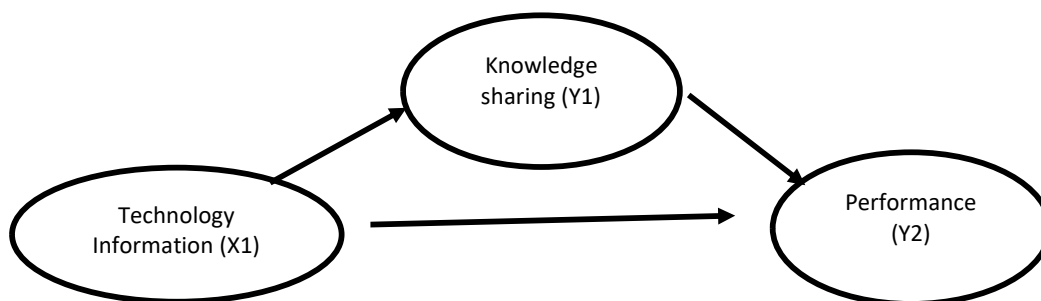


Figure 1. Conceptual Framework

*H1: Information Technology affects performance*

*H2: Information Technology involves knowledge sharing*

*H3: Knowledge Sharing affects performance*

*H4: Knowledge sharing mediates the relationship of information technology to performance*

## **RESEARCH METHOD**

The research was conducted in 2021-2022 and was carried out in Surabaya. The method used to determine the place of study is carried out deliberately, taking into account the data on national GDP.

The research population is SMEs engaged in the food and beverage business. The criteria for SMEs in this study are those with a yearly turnover of at least Rp. Three hundred million to more than 2.5 billion and have 5 to more than 20 employees. The population of SMIs that meet these criteria amounts to 267 SMIs. Teknik sampling in this study used *purposive sampling*. From the 267 population, 160 food and beverage SMIs were taken with the criteria of having a minimum of 10 employees at the managerial level and having a turnover per year of at least Rp 300 million to more than 2.5 billion.

**The information technology variable in this study refers to Hobday's (2000) theory, which defines information technology as one of the key innovations that is frequently used to assist all production and marketing processes in businesses. In this study, information technology (X1) was measured using the Kearns and Lederer (2000) indicators, that is: information technology compatibility with business plans (X11) and information technology compatibility with competitive strategy (X12).**

**The variable Knowledge sharing refers to Cummings and Teng's (2003) theory, which states that knowledge sharing is a process of explicit and implicit knowledge sharing that occurs between individuals, groups, departments, or organizations. The Cabrera and Cabrera (2005) indicators are used in the knowledge sharing indicator (Y1), which explains that knowledge sharing can be seen through two indicators: provider behavior (Y11) and knowledge seeking (Y12).**

**According to Gibson et al. (1996), performance is the result of work that is done in accordance with organizational goals, such as work quality, work quantity, efficiency, and other effectiveness criteria. Performance (Y2) was measured using the Bartoli and Blatrix (2015) indicators, That is: effectiveness (Y21), efficiency (Y22), increased sales (Y23), and achievement of company goals (Y34)**

The measurement scale in this study used a Linkert scale with standard scales 1 to 5. The questionnaires with the Linkert scale are strongly disagreed (notation 1), disagreed (notation 2), neutral (notation 3), agreed (notation 4), and strongly agreed (note 5). The assessment is used to measure variables with each of their indicators. The higher the indicator score, the more positive the respondent's perception of this variable.

**The AMOS 23 software is used for multivariate analysis, specifically the structural equation model (SEM), to test the hypothesis. Before trying to perform the mediation analysis test, the following assumptions and model fit tests must be completed in this SEM model: outer validity test model (loading factor), reliability test, normality test, and model fit test. To proceed with mediation test analysis using SEM analysis and the Sobel test, all tests must meet the requirements.**

## **RESULT AND DISCUSSION**

### Test of Validity and Reliability

To determine whether an indicator is valid or not, it can be seen through *the Confirmatory Factor Analysis (CFA)*. In contrast, the Reliability Test (*Construct Reliability*) can be seen through *the value of the construct reliability* between indicators. The reliability test can be strengthened by calculating the average VE (Variance Extracted) value if the value is AVE. As for the calculation formula for CR and VE:

$$\text{Construct Reliability} = \frac{(\sum \text{Std Loading})^2}{(\sum \text{Std Loading})^2 - \sum \epsilon_j} \quad \text{Variance Extracted} = \frac{\sum \text{Std Loading}^2}{\sum \text{Std Loading}^2 - \sum \epsilon_j}$$

The results of the CFA calculation in this study are summarized in table 1.

**Table 1. CFA Test Results**

	Indicator	Estimate
X12	<--- X 1	.939
X11	<--- X 1	.904
Y11	<--- Y 1	.977
Y12	<--- Y 1	.970
Y21	<--- Y 2	.980
Y22	<--- Y 2	.983
Y23	<--- Y 2	.985
Y24	<--- Y 2	.972

The results of the CFA test on the loading factor value (Estimate) of each indicator above 0.5 means that the hand can be used to explain existing constructs or measure a variable.

The results of the reliability test in this study, based on the calculation of CR and VE, are presented in table 2.

**Table 2. Reliability test**

Variable	CR	VE
Information technology	0,919	0,849
Knowledge sharing	0,973	0,948
Performance	0,990	0,960

The reliability test results show that all variables' CR value is > 0.700, and the VE value is > 0.500. Thus all variables are already reliable and feasible so that the next test can be carried out.

### Normality Test

The normality test was carried out by comparing the CR (critical ratio) value in the assessment of normality with the critical  $\pm 2.58$ . The results of the normality test in this study are summarized in table 3.

**Table 3. Normality Test**

Variable	Min	max	Skew	c.r.	Kurtosis	c.r.
Y24	1.000	5.000	-.382	-1.975	-.984	-2.540
Y23	1.000	5.000	-.339	-1.751	-1.086	-2.305
Y22	1.000	5.000	-.350	-1.806	-1.210	-2.125
Y21	1.000	5.000	-.318	-1.640	-1.119	-2.288
Y12	1.000	5.000	-.240	-1.238	-.716	-1.849
Y11	2.000	5.000	-.213	-1.101	-.694	-1.792
X11	1.000	5.000	-.303	-1.564	-.743	-1.919
X12	1.000	5.000	-.135	-.695	-.469	-1.212

Table 3 of the normality test shows that each variable indicator has a *critical ratio* (CR) value less than  $\pm 2.58$ . So indicator variables are called a normal distribution.

### 3.7. Test goodness of fit

The degree of conformity between the model and the data user must use various *fit indices*. The results of the *goodness of fit* test in this study are presented in table 4.

**Table 4. Test the goodness of fit**

The integrity of Fit Criteria	Cut of Value	Analysis Results	Evaluation Type
Degree of Freedom (DF)	Positive (+)	228	-
X <sup>2</sup> (Chi - Square)	264,22	260,33	Fit
Signifikansi Probability	$\geq 0,05$	0,070	Fit
CMIN/DF	$\leq 2,00$	1,142	Fit
CFI	$\geq 0,90$	0,996	Fit
TLI	$\geq 0,90$	0,995	Fit
RMSEA	$\leq 0.08$	0,030	Fit

The results are in table 4. It shows that the fit model has passed the threshold value; therefore, it can be done at the next stage, namely analyzing the path analysis to analyze the influence between variables.

### 3.8. Inferential Statistical Analysis

The structural equations used for this study to explain the influence between variables are :

$$1. Y_1 = b_1X_1 + \zeta$$

$$2. Y_2 = b_1X_1 + b_3Y_1 + \zeta$$

Information:

X<sub>1</sub>: Information Technology

Y<sub>1</sub>: Knowledge Sharing

Y<sub>2</sub>: Performance

For mediation analysis using the Sobel test calculation method. The calculation formula for the Sobel test is:

$$Sab = \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2}$$

With a caption:

Sat: The magnitude of the standard error indirect influence

a: Independent variable path with intervening variable

b: Path of intervening variables with dependent variables

sa: Standard error coefficient a

sb: Standard error coefficient b

To test the significance of indirect influences, then we need to calculate the value of t of the coefficients by the following formula:

$$t = \frac{ab}{sorb}$$

The value of t counting is compared with the value of t of the table; if the value of t counts > the value of t of the table, then it can be concluded that there is an influence of mediation.

#### 4. Results and discussions

This research examines the influence between information technology and knowledge sharing on company performance. As well as analyzing the mediation of knowledge sharing between the relationship of information technology to perform in table 5.

**Table 5. Analysis Results SEM**

Influence	Coefficient	S.E	C.R.	P	Information
X1 → Y1	.268	.024	11.291	***	Significant
X1 → Y2	0.428	.540	2.813	.005	Significant
Y1 → Y2	2.078	.466	4.463	***	Significant

Based on the results of the SEM analysis in table 5, it can be seen that the critical ratio (CR) value for the influence of information technology variables on knowledge sharing of 11.291 is greater than the table t value (1.960), and the significance value of 0.000 < 0.05. Then it can be stated that information technology has a positive influence on knowledge sharing. The better the information technology offered by the company, the higher the level of knowledge sharing between employees. Moreover, suppose IKM can take advantage of information technology with a competitive strategy. In that case, it can increase efficiency and focus on accelerating its services and providing information to the consumer, as well as by delivering learning about information technology, IKM can compete with other companies.

#### Discussion

It is in line with the research (Saide *et al.*, 2017), which states that information technology significantly affects knowledge sharing. Next, Research (Wisnuharnowo, Hermanto, and Sakti, 2020) also states that information technology substantially influences knowledge sharing. It proves that organizations can share knowledge quickly and efficiently by applying the right information technology. However, this research differs from the research (Adedolapo & Wole, 2019) states that there is no influence of information technology variables on knowledge sharing. The existence of differences in the use of Information Technology in organizations has a different effect on the culture of sharing knowledge in organizations.

Based on the results of the SEM analysis in table 5, it can be seen that the value of the critical ratio (CR) for the influence of information technology variables on the performance of 2.813 is greater than the table t value (1.960) and the significance value of  $0.005 < 0.05$ . Moreover, a coefficient value of 0.428 with a positive direction is obtained. Thus, it can be stated that information technology affects performance. It means that the better the company's information technology, the higher its operational performance.

This research is in line with the study (Nabeel-Rehman & Nazri, 2019), (Ilmudeen, Aboobucker, and Bao, 2018), dan (Mwithiga, Njihia, and Iraki, 2017) which states that information technology has a significant effect on performance. IKM owners need to apply their company's information technology capabilities to develop dynamic capabilities, such as acquisition and sales capacity, which can later improve the company's performance. Companies with effective integration of information technology can obtain superior performance. Performance is achieved through complementary effects of complex interactions between tangible (human) and intangible (information systems) information technology resources.

The further research in this study is the research (Chae, Koh, and Prybutok, 2014) which states no significant relationship between information technology and performance concerning research. (Ilmudeen, Aboobucker and Bao, 2018) Information technology management practices must be utilized first so that performance improves. At the same time, research (Chae, Koh, and Prybutok, 2014) cannot take advantage of information technology management due to poor leadership, so performance cannot improve.

Thus this research is in line with the theory (Argyres, 1999) offers two reasons why companies need to pay attention to information technology in improving performance. First, information systems help coordination directly by making information processing cheaper. Second, this enhanced information processing makes project governance more efficient. SMEs need to pay attention to the variables of knowledge sharing in improving performance, especially in the high altitude of the behavior of providers (IKM owners, senior employees, and external parties) in sharing their knowledge and experience with new employees, which can increase the level of company productivity, thereby improving performance.

This research is in line with the study (Imamoglu *et al.*, 2019), which states that knowledge sharing significantly affects performance. With knowledge, the company provides an opportunity for collective learning and creates innovative ideas in the production process to reduce production costs. Companies need to build awareness for experienced employees to be willing to share their knowledge with employees who lack the experience to benefit them and the company collectively. Companies also need to support by providing facilities in the form of training for newly employed employees to adapt to the work environment.



The analysis of indirect influences showed that the value of the calculated t value for the impact of information technology variables on performance through knowledge sharing was 4.127, more significant than the table t value (1.960). At the same time, the coefficient value is 0.556, more significant than the direct influence of information technology on operational performance, whose coefficient value is 0.428. It shows that there is a positive influence of information technology on operational performance through knowledge sharing.

This is a finding in this study, which states that knowledge-sharing variables mediate the relationship between information technology and performance. This research is supported by Research (Mwithiga, Njihia, and Iraki, 2017) and aims to contribute to understanding the relationship between integrated information technology and business operations strategies in improving performance. Research (Mwithiga, Njihia, and Iraki, 2017) states that information technology significantly affects performance. Companies with effective IT Integration can obtain superior performance. Research (Kaewchur, Anussornnitisarn, and Pastuszak, 2013) analyze the role of knowledge sharing as a mediating variable in the relationship between information technology and innovation. Research Results (Kaewchur, Anussornnitisarn, and Pastuszak, 2013) demonstrate that information technology and knowledge sharing positively affect organizational innovation and provide additional evidence that knowledge sharing can mediate leveraging information technology to enhance corporate governance innovation.

Thus, companies need to develop the concept of sharing knowledge between employees to speed up the information technology process to improve company performance more effectively and efficiently. Delivering the correct information can improve the company's operational performance. Based on the results of the hypothesis test that has been carried out, a summary can be presented as follows:

**Table 6. Rangkuman Hipotesis**

Hypothesis	Information
H1: Information technology → Knowledge sharing	Support
H2: Information technology → Performance	Support
H3: Knowledge Sharing → Performance	Support
H4: Information technology → Knowledge Sharing → Performance	Support

## 5. Conclusions

Knowledge sharing in research has a significant role in mediating the relationship between information technology and performance. By applying knowledge sharing efficiently in improving the company's information technology. The delivery of information received by the company is expected to be right on target so that the company's performance can improve. By aligning information technology plans and business plans, information technology will support business objectives and allow information technology to be a strategic component.

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