INTERNATIONAL JOURNAL OF SOCIAL SERVICE AND RESEARCH

THE INFLUENCE OF KNOWLEDGE CREATION AND KNOWLEDGE SHARING ON PRODUCT DEVELOPMENT WITH PRODUCT INNOVATION MEDIATION EMPIRICAL STUDY ON THE R&D FOOD INDUSTRY

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Abstract

In this study, the effect of knowledge creation and knowledge sharing on product development through the mediation of product innovation was investigated. This research was conducted because of the research gap in previous studies regarding the effect of knowledge creation and knowledge sharing on product development. This research is quantitative and was conducted by distributing questionnaires to food and beverage companies in Jakarta and obtaining 50 respondents. The data obtained were processed using SMART-PLS. According to the findings of this study, knowledge sharing has no significant effect on product development; knowledge creation has no significant effect on product development; knowledge creation has a significant positive effect on product innovation; knowledge sharing has a significant positive effect on product innovation; product innovation has a significant positive effect on product development; product innovation mediates the relationship between knowledge creation and product development, and product innovation mediates the relationship between knowledge sharing and product development. From the result, it can be suggested that the company needs to design activities, create internal company forums, create a database for the R&D department, and require employees to carry out activities outside the company. Both suggestions can be adapted to the majority of the working executives' generation. It is expected to be more effective in implementation.

Keywords: Food industry; knowledge creation; knowledge sharing; product development; product innovation

Received 1 October 2022, Revised 14 October 2022, Accepted 26 October 2022

INTRODUCTION

The food industry contributes to national economic expansion. This is reinforced by the Ministry of Industry which projects the food and beverage industry to grow above 5 percent throughout 2021 (Lestari, 2021). To support it, the government provides intensive import duties borne by the government for the import of several raw materials.

The food industry in Indonesia, especially during the pandemic, is experiencing a downward trend (Figure 1). The decline in this trend can be caused by several things, one of which is the lack of product innovation carried out by food industry companies during the pandemic. After the pandemic, people's consumption patterns have changed, so the food industry is required to be more active in innovating (Kementerian Perindustrian Republik Indonesia, 2021).

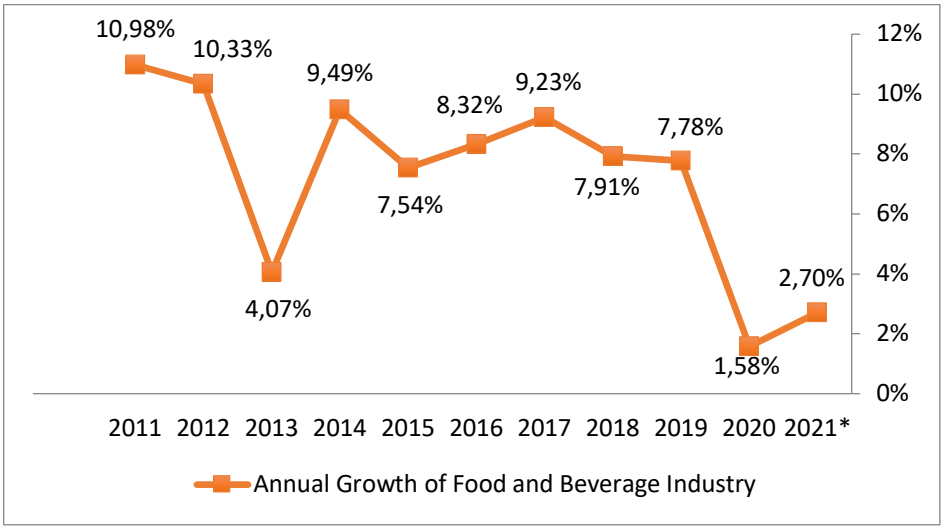

Figure 1. Annual Growth of The Indonesian Food Industry
Source: DataIndustri.com

Companies with a competitive advantage in this market are frequently those with distinctive products, procedures, and customer services (Hidayat et al., 2021). One of the ways to increase the competitive advantage is to carry out product innovation which means launching new products according to market needs.

Innovation is one of the most important components underlying a company's long-term competitive advantage (Cheng & Nasurdin, 2010). Also, product development is necessary because of the nature of consumers who tend to get bored easily. There are three types of development in developing food products, namely: making new products, modifying existing products, and imitating other products (Ilmayana, 2021). In conducting product innovation, the food industry is currently investing in its internal resources, such as the research and development (R&D) team. In today's quickly changing business world, a strong R&D operation is seen as a fundamental enabler of competitive advantage (Cho, 2018). To be a success in developing the product, a good knowledge resource is needed.

Knowledge and technology are becoming more widely recognized as strategic assets and main sources of competitive advantage (Lai & Lin, 2012). Therefore, currently, several companies are working hard to implement knowledge management. Knowledge management is a management function that involves the generation of knowledge, the management of knowledge flow throughout the organization, and the effective and efficient application of knowledge for the long-term benefit of the business (Cheng & Nasurdin, 2010). The improvement in organizational performance will be achieved, when the management of knowledge is done properly (Victoria et al., 2020).

Currently, the food industry is trying to implement knowledge management to improve organization performance through product development. Applying knowledge management in companies aims to have systematic data, thus enabling companies to make better decisions. To be useful for the organization, the knowledge management in the organization must run well. Knowledge management includes its components, namely knowledge creation, knowledge sharing, and knowledge application.

However, in research on knowledge management, product innovation, and product development, there is a research gap. Research (Rajapathirana & Hui, 2018) entitled The Relationship Between Knowledge Management and Innovation Performance

demonstrates that knowledge management activities have direct and indirect effects on innovation and organizational performance via a rise in innovation capability. Additionally, it was discovered that knowledge creation, knowledge integration, and knowledge application enhance innovation and performance. This contrasts with the research conducted by (Victoria et al., 2020). In their article titled Knowledge Management and Performance of Organizations: A Case Study of Selected Food and Beverage Firms, they demonstrate that knowledge creation has a significant negative impact on innovation, whereas knowledge sharing has a significant positive impact on innovation.

The differences in the results of these studies are also seen in the current food industry R&D. In the data obtained from interviews with 7 respondents from 7 different companies. It shows that all respondents have been active in sharing knowledge in the R&D department, by holding sharing sessions regarding project progress in each R&D team. In the sharing session, each individual R&D shared about the progress of the project being carried out, along with the problems they face in developing new products. However, the majority of respondents have not implemented knowledge creation in the R&D department. This can be seen from the majority of respondents who do not store research results in the company system. In the absence of data stored in the company's system (for products that have not been launched), it will hinder the exchange of information in the event of an employee exchange, because the research data is only known by researchers. In addition, the R&D of each company issues a different number of new products each year. This identifies that there are obstacles in product development.

Based on field observations, not all products developed by R&D will be launched in the market. One of the factors is the changing market trends. This delay in launch time can be caused by the length of time required for product development, which is due to the lack of information obtained about market trends.

Because knowledge is one of the most essential aspects in the formation of a new product or process concept, the organization must manage knowledge creation for the process of developing new products or processes to continue (Indriartiningtias et al., 2017). Knowledge is created by each individual and the organization creates an environment that can encourage individuals to be creative and to produce new knowledge. Therefore, organizations need to provide a good and structured platform for individuals within the company, so that the company and others can use the knowledge.

The study "Knowledge Management and Performance of Organizations: A Case Study of Selected Food and Beverage Firms" (Victoria et al., 2020) demonstrates that knowledge creation has a significant negative effect on innovation. It also discovers that knowledge sharing has a significant positive impact on innovation. Knowledge creation has a significant positive effect on job satisfaction, whereas knowledge sharing has an insignificant negative effect. Moreover, Bandinelli et al. (2014) found that the correlation between Knowledge Management maturity and New Product Development in the Electrical industry is positive. In addition, Daschievici and Ghelase (2014) examine that knowledge management model for food research, supported by cutting-edge information technology.

Based on those phenomena, this study aims to examine

- Knowing the effect of knowledge sharing on product development
- Knowing the effect of knowledge creation on product development
- Knowing the effect of knowledge creation on product innovation
- Knowing the effect of knowledge sharing on product innovation
- Knowing the effect of product innovation on product development

- Knowing the effect of product innovation as a mediator on the relationship between knowledge creation and product development
- Knowing the effect of product innovation as a mediator on the relationship between knowledge sharing and product development.

Research Hypothesis

1. **The Relationship Between Knowledge Sharing and Product Development**

   Knowledge sharing refers to the communication between team members that are required for product development (Cheng & Nasurdin, 2010b). Project success is based on effective knowledge sharing in complex, time-consuming interactions (Thamhain, 2004). When organizations are effective at sharing knowledge, the flow of information is increased, allowing the organization to generate superior products. Based on observations, it is suspected that knowledge sharing affects product development because, with the exchange of knowledge between individuals, individuals will acquire new knowledge and can apply this knowledge to product development. Based on support from the literature, The following hypothesis is:

   H1: Knowledge sharing has a positive effect on product development

2. **The Relationship Between Knowledge Creation and Product Development**

   Working on product development allows for team-based knowledge creation, problem-solving, and brainstorming to address product-related challenges (Poh Kiat Ng et al., 2011). The study discovered a relationship between new product development and the generation and management of new knowledge (Cheng & Nasurdin, 2010b). With the creation of good knowledge within the company, the R&D team will be able to easily obtain the knowledge needed to support product development. Therefore, following these previous studies, the hypothesis is:

   H2: Knowledge creation has a positive effect on product development

3. **The Relationship Between Knowledge Creation and Product Innovation**

   Based on research Victoria et al. (2020), The creation of knowledge had a significant negative impact on innovation. However, the study by Rajapathirana and Hui (2018) shows that knowledge creation facilitates innovation. Moderating effects of knowledge acquisition improve new product performance (Rajapathirana & Hui, 2018). Based on previous research, it is said that Knowledge creation, integration, and application enhance innovation and performance. Also, it is said that The effectiveness of knowledge acquisition has a significant positive relationship with product innovation. Based on the literature, the next hypothesis is:

   H3: Knowledge creation has a positive effect on product innovation

4. **The Relationship Between Knowledge Sharing and Product Innovation**

   According to research Victoria et al. (2020), knowledge sharing had a significant positive effect on innovation. "Innovative information use," "efficient information collection," and "shared interpretation" are the knowledge management tools. increase the performance of new items and the ability to innovate (Rajapathirana & Hui, 2018). Based on the research that has been done, it is known that knowledge sharing has a significant positive effect on innovation. Based on it, the hypothesis used in this study is:

   H4: Knowledge sharing has a positive effect on product innovation

5. The Role of Product Innovation

Process and product innovation are both examples of innovation. Process innovation does not deliver a new product to the market. It helps to provide a better solution to meet existing or new requirements. Product development also includes new product development and existing product development. Existing product development requires minimal innovative thinking as no novel ingredients or processes are required.

Product innovation is the management framework for making adjustments and enhancements to products (Rainey, 2009). It entails the development, validation, and marketing of new products, as well as their conceptualization, design, and development. Thus, new product development becomes part of product innovation. Successful new products are developed through an effective new product development process that streamlines the flow of activities and outcomes from concept to commercialization by combining previous new product development program knowledge with the skills and abilities of the participants (Rainey, 2009).

H5: product innovation has a positive effect on product development

H6: product innovation mediates the relationship between knowledge creation and product development

H7: product innovation mediates the relationship between knowledge sharing and product development

METHOD

This quantitative study's subjects are Indonesian food industry research and development executives in Jakarta. Meanwhile, the sample for this study consisted of 50 food industry research and development executives in Jakarta. This study was preceded by conducting interviews with 7 respondents according to the research criteria. The results of these interviews are then used as evidence data in this study. After obtaining evidence data, compiling the theory of previous research, and compiling research hypotheses, then proceed with compiling a questionnaire.

The non-probability sampling technique was used in conjuction with a judgmental sampling technique. This questionnaire is then distributed online. After obtaining 30 respondents who met the criteria, a pre-test was carried out. The purpose of this pre-test is to find out whether the items in the questionnaire are valid. After the pre-test data were processed using SPSS and were valid, the questionnaire was distributed and continued. After 50 respondents was collected, several tests were carried out, namely instrument testing, descriptive analysis, and hypothesis testing. Insturment test and hypothesis test are carried out by SMART-PLS, using Structural Equation Modeling (SEM) with 10% significance level.

RESULTS AND DISCUSSION

A. Instrument Test

Several tests, including descriptive statistics, validity tests, reliability tests, and hypothesis testing, were performed in this study. Descriptive statistics were processed using SPSS. While the other tests were processed using SMART-PLS. The results of each test are described in Figure 2 and will be explained below.

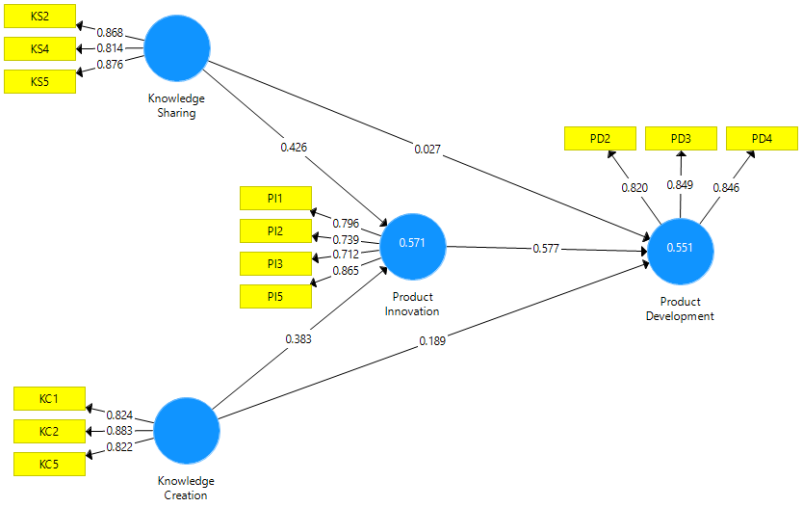

Figure 2. Outer Model

1. Validity Test

A validity test was carried out using SMART-PLS. The validity test analysis uses two methods, namely discriminant validity and construct validity. The degree to which a construct differs from others is referred to as discriminant validity (Acosta-Prado et al., 2020).

The square root of each construct's AVE must be greater than the correlation with any other construct, according to Fornell-Larcker's criterion (Acosta-Prado et al., 2020). Based on the test findings and this theory (Figure 5), all variables are valid.

	Knowledge Creation	Knowledge Sharing	Product Development	Product Innovation
Knowledge Creation	0.844			
Knowledge Sharing	0.743	0.853		
Product Development	0.613	0.577	0.839	
Product Innovation	0.700	0.711	0.728	0.781

Figure 3. Fornell-Larcker

In addition to looking at the Fornell-Larcker value, the cross-loadings value is also seen. The correlation of specific items with all constructs inside the model, including the construct they are meant to reflect, is measured by cross-loading (Achjari, 2004). The criterion is that an item's load should be higher for the construct it is required to reflect than for the other constructs (Achjari, 2004). Based on the results obtained (Figure 6), it can be said that all constructs are following the theory.

	Knowledge Creation	Knowledge Sharing	Product Development	Product Innovation
KC1	0.824	0.704	0.437	0.573
KC2	0.883	0.615	0.565	0.506
KC5	0.822	0.571	0.539	0.676
KS2	0.691	0.868	0.621	0.633
KS4	0.566	0.814	0.411	0.553
KS5	0.634	0.876	0.419	0.626
PD2	0.421	0.380	0.820	0.478
PD3	0.569	0.445	0.849	0.630
PD4	0.530	0.598	0.846	0.690
PI1	0.619	0.597	0.474	0.796
PI2	0.509	0.591	0.626	0.739
PI3	0.357	0.424	0.530	0.712
PI5	0.663	0.587	0.632	0.865

Figure 4. Cross-Loadings

2. Reliability Test

To see the reliability of an indicator, initially, an analysis of the value of the outer loadings of each indicator is carried out. Individual item reliability is tested using outer loadings, with suitable values given to those over 0.708 (Achjari, 2004). Based on this theory, the following are indicators that have a value ≥ 0.708.

	Knowledge Creation	Knowledge Sharing	Product Development	Product Innovation
KC1	0.824			
KC2	0.883			
KC5	0.822			
KS2		0.868		
KS4		0.814		
KS5		0.876		
PD2			0.820	
PD3			0.849	
PD4			0.846	
PI1				0.796
PI2				0.739
PI3				0.712
PI5				0.865

Figure 5. Outer Loadings

Malhotra et al. (2007) said that the reliability coefficient is between 0.70-0.90. And based on (Acosta-Prado et al., 2020) it is said that the value of AVE is said well if greater than 0.500, which means it accounts for more than 50% of the variation in the items it reflects. Figure 8 demonstrates that each variable's Cronbach's Alpha is greater than 0.70 and the AVE is greater than 0.50, which means that all variables in this study are reliable.

	Cronbach's Alpha	rho_A	Composite Rel...	Average Variance Extracted (AVE)
Knowledge Creation	0.798	0.801	0.881	0.712
Knowledge Sharing	0.814	0.826	0.889	0.728
Product Development	0.792	0.806	0.877	0.704
Product Innovation	0.785	0.796	0.861	0.609

Figure 6. Cronbach's Alpha & AVE

B. Descriptive Analysis

In this study, 50 respondents met the criteria, namely respondents who worked as R&D for the food industry in Jabodetabek. Based on the data obtained from the respondents, then a descriptive analysis was carried out, to determine their characteristics. The following are the gender, age, and length of work, of the respondents.

1. Respondent Profile Based on Gender

Based on data obtained from 50 respondents who met the criteria, there were 78% female respondents, and 22% male respondents.

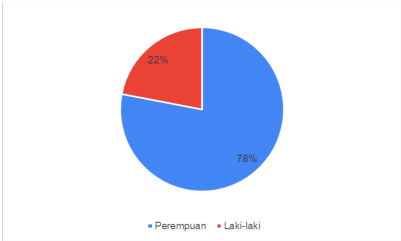

Figure 7. Respondents' profiles Based on Gender

2. Respondent Profile Based on Age

Based on the data, respondents are dominated by the age group of 26-30 years, which is 62% of the total respondents. Meanwhile, the second largest respondent was in the age group of 21-25 years, which was 22%. And the least respondents are respondents with the age group > 35 years, which is 4% of the total respondents.

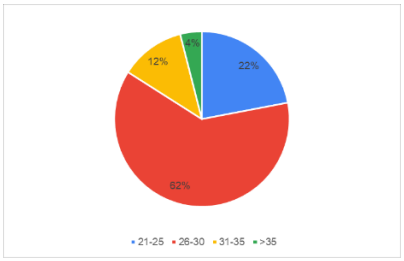

Figure 8. Respondents' Profile Based on Age

3. Respondent Profile Based on the length of Work as R&D

Based on the results obtained, there are 58% of the total respondents who work as R&D in the food industry for 1 – 5 years. Meanwhile, respondents who worked in R&D for 6 - 10 years were 42%.

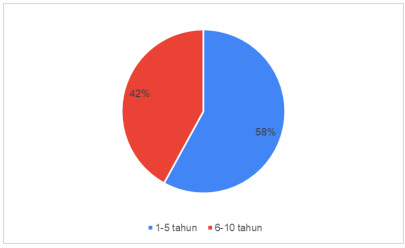

Figure 9. Respondents' Profile Based on Length of Working as R&D

4. Descriptive Statistic

In the questionnaire, a Likert scale was used which was divided into 5 categories in the respondents' answers, namely strongly disagree (1), disagree (3), neutral (3), agree (4), and strongly agree (5). Therefore, the interval used is 0.8. The value of the interval is obtained by subtracting the

maximum value (5) from the minimum value (1) and dividing it by the total number of answers (5). Table 1 shows the categories of these interval.

Table 1
Interval Category

Interval	Category
4.20 < a ≤ 5.00	Strongly Agree
3.40 < a ≤ 4.20	Agree
2.60 < a ≤ 3.40	Neutral
1.80 < a ≤ 2.60	Disagree
1.00 < a ≤ 1.80	Strongly Disagree

Based on the predetermined interval, then the calculation of descriptive statistics using SPSS is carried out. From 50 respondents who filled out the questionnaire, descriptive statistics were obtained, such as the frequency of the answer scores, means, and category of each indicator. Tables below display descriptive statistics.

Table 2
Knowledge Sharing Mean Score

No	Indicators	Response Score Frequency					Mean	Category
	Knowledge Sharing	1	2	3	4	5		
1	Ability to solve problems with creative solutions	0	0	4	25	21	4.34	Strongly Agree
2	Ability to convey knowledge gained from internal and external companies	0	1	8	21	20	4.20	Agree
3	Ability to socialize and communicate with others.	0	0	7	23	20	4.26	Strongly Agree
	Knowledge Sharing Mean Score						4.27	Strongly Agree

As shown in Table 2, respondents strongly agree with sharing of knowledge. It showed from the total score of 4.27 on this variable. The most significant indicator is the ability to solve problems with creative solutions. It is indicated by a score of 4.34. It shows that respondents, members of the R&D team, actively share knowledge, so that they can solve problems with creative solutions.

Table 3
Knowledge Creation Mean Score

No	Indikator	Response Score Frequency					Mean	Category
	Knowledge Creation	1	2	3	4	5		
1	Process	0	0	9	25	16	4.14	Agree
2	Output	0	0	9	26	15	4.12	Agree
3	The organization facilitates space for create knowledge	0	3	4	24	19	4.18	Agree
	Knowledge Creation Mean Score						4.15	Agree

In Table 3, the total score of knowledge creation is 4.15, which means that the respondents agree with the variable. The three indicators on the knowledge creation have scores that are not significantly different,

namely 4.14 for the process, 4.12 for the output, and 4.18 for the organization facilitates space for creating knowledge. It shows that during team meetings, respondents provide information to each other about the stages of product development that are being carried out and show ideas obtained from the knowledge creation process. The company where the respondents work also facilitates the creation of knowledge within the company.

Table 4
Product Innovation Mean Score

No	Indikator	Response Score Frequency					Mean	Category
	Product Innovation	1	2	3	4	5		
1	Uniqueness	1	3	4	29	13	4.00	Agree
2	Quality	0	1	5	23	21	4.28	Strongly Agree
3	Multifunction	0	6	13	22	9	3.68	Agree
4	Research	0	3	8	20	19	4.10	Agree
	Product Innovation Mean Score						4.015	Agree

Table 4 shows the product innovation mean score, it shows that the most significant indicator is quality. It is indicated by a score of 4.28. It means that the respondent regularly generates product ideas with the best quality to support product innovation.

Table 5
Product Development Mean Score

No	Indikator	Response Score Frequency					Mean	Category
	Product Development	1	2	3	4	5		
1	Efficiency	1	5	4	24	16	3.98	Agree
2	Market oriented	0	2	6	20	22	4.24	Strongly Agree
3	Product improvement	0	1	6	22	21	4.26	Strongly Agree
	Product Development Mean Score						4.16	Agree

For product development, respondents most agree with market-oriented and product improvement indicators. It is indicated by scores of 4.24 and 4.26. The score indicates that the respondent is developing new products according to market needs and developing new products with improved performance compared to previous products.

Figure 10 demonstrates the value of the R square. R square value for product innovation is 0.571. This means that the independent variables (knowledge sharing and knowledge creation) affect product innovation by 0.571 or 57.1%. This value indicates that the independent variable has a moderate effect on product innovation.

	R Square	R Square Adjusted
Product Development	0.551	0.522
Product Innovation	0.571	0.552

Figure 10. R-Value

For the product development variable, the R square value obtained is 0.551. This proves that knowledge sharing, knowledge creation, and product innovation affect product development by 55.1%. This value indicates that these three variables have a moderate effect on product development.

C. Hypothesis Test

The following research model is derived from the final results of the main test with 50 samples that meet the respondents' criteria. The path diagram of the SMART-PLS software shows how much the independent variable influence the dependent variable.

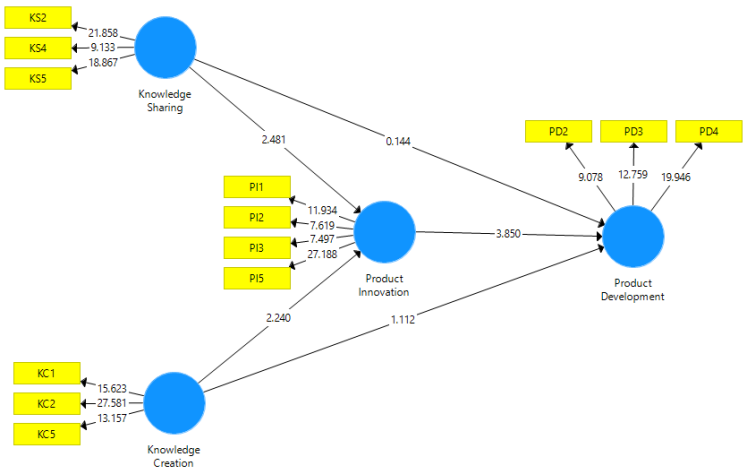

Figure 11. Hypothesis Test

The hypothesis is accepted if the two-tailed t-statistic is greater than 1.65 and the p-value is less than 0.10. Figure 12 demonstrates the outcomes of the hypothesis test. This table indicates that the p-value of knowledge sharing on product development (H1) and knowledge creation on product development (H2) is greater than 0.10. This shows that the two hypotheses are not accepted.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Knowledge Creation -> Product Development	0.189	0.183	0.170	1.112	0.267
Knowledge Creation -> Product Innovation	0.383	0.393	0.171	2.240	0.026
Knowledge Sharing -> Product Development	0.027	0.048	0.190	0.144	0.885
Knowledge Sharing -> Product Innovation	0.426	0.420	0.172	2.481	0.013
Product Innovation -> Product Development	0.577	0.569	0.150	3.850	0.000

Figure 12. Path Coefficients (Mean, STDEV, T-values & P-values)

In Figure 13, the results of hypothesis 6 (Product innovation mediates the relationship between knowledge creation and product

development) and hypothesis 7 (Product innovation mediates the relationship between knowledge sharing and product development) test are shown. The results of the H6 and H7 tests showed that the p-values for H6 were 0.093 and 0.020 for H7. This means that both hypotheses are accepted.

	Original Sample...	Sample Mean ...	Standard Dev...	T Statistics ...	P Values
Knowledge Sharing -> Product Innovation -> Product Development	0.246	0.231	0.105	2.334	0.020
Knowledge Creation -> Product Innovation -> Product Development	0.221	0.232	0.131	1.683	0.093

Figure 13. Special Indirect Effects (Mean, STDEV, T-values & P-values)

D. Discussion

Table 6 shows the outcomes of the hypothesis testing. The table shows the t-value and p-value of each hypothesis. Based on this value, it can be concluded that the variables are accepted and not accepted.

Table 6
Hypothesis Test

Research Hypothesis	t-value	p-value	Conclusion
H1: Knowledge sharing has a positive effect on product development	0.144	0.885	Not Accepted
H2: Knowledge creation has a positive effect on product development	1.112	0.267	Not Accepted
H3: Knowledge creation has a positive effect on product innovation	2.240	0.026	Accepted
H4: Knowledge sharing has a positive effect on product innovation	2.481	0.013	Accepted
H5: Product innovation has a positive effect on product development	3.850	0.000	Accepted
H6: Product innovation mediates the relationship between knowledge creation and product development	1.683	0.093	Accepted
H7: Product innovation mediates the relationship between knowledge sharing and product development	2.334	0.020	Accepted

1. Effect of Knowledge Sharing on Product Development

Table 6 shows that the t-value and p-value for H1 are 0.144 and 0.885, respectively. The p-value is greater than 0.10, and the t-value is less than 1.65, indicating that knowledge sharing has no significant direct effect on product development.

2. Effect of Knowledge Creation on Product Development

The results in Table 6 show that the t-value and p-value for H2 are 1.112 and 0.267, which means the t-value is < 1.65 and the p-value is > 0.10. These findings indicate that H2 cannot be supported. This means that knowledge creation has no significant effect on product development.

3. Effect of Knowledge Creation on Product Innovation

The t-value and p-value for H3 are 2.240 and 0.026, respectively, as shown in Table 6. This value indicates that H3 is accepted because the t-value is greater than 1.65 and the p-value is less than 0.10. These results mean that knowledge creation has a significant effect on product innovation.

Knowledge creation facilitates innovation (Rajapathirana & Hui, 2018). Knowledge is seen as the key to innovation and a valuable commodity for businesses looking to obtain a competitive advantage over their competitors. Successful companies can create and disseminate knowledge rapidly, then transfer the knowledge into new products (Gao & Bernard, 2018).

Knowledge is tacit, scattered, and ingrained within individuals (Park et al., 2015). As a result, the organization must devise initiatives to elicit knowledge from its employees, stakeholders, suppliers, and other third parties. These activities should involve all aspects of individuals, both inside and outside the company, who can provide new knowledge to company members.

By creating good knowledge in the company, employees will easily gain new knowledge. This knowledge usually covers the latest market and technology trends. This is what can later be applied in product innovation so that the new product will be better than the previous product.

4. Effect of Knowledge Sharing on Product Innovation

Based on the results obtained, the t-value and p-value for H4 are 2.481 and 0.013, which indicates that the t-value is >1.65 and the p-value is <0.10. These results indicate that H4 is approved, which means that knowledge sharing has a significant effect on product innovation.

The sources of new knowledge are tacit knowledge and lived experience. It can be found in personal knowledge and experiences (Park et al., 2015). It enabled effective knowledge sharing in the product discovery process and the attainment of competitive advantage. Effective knowledge exchange accelerates and enhances product innovation (Gao & Bernard, 2018). Knowledge sharing allows people to better their work performance and generate new ideas and innovations (Gao & Bernard, 2018).

By actively sharing knowledge within the R&D team, each individual in the team will acquire new knowledge regularly. This knowledge will help the team in product innovation. In addition, having new knowledge gained from knowledge sharing will help employees in solving problems they encounter with creative solutions.

5. Effect of Product Innovation on Product Development

Table 6 reveals that the t-value for H5 is 3.850, which means it is greater than 1.65. Meanwhile, the p-value is 0.000, which indicates that it is less than 0.10. These data indicate that hypothesis H5 is accepted, in which product innovation has a significant effect on product development.

Product innovation is the organizational framework for introducing product enhancements (Rainey, 2009). It encompasses the conception, design, development, validation, and marketing of new products. Thus, product innovation includes new product development.

And vice versa. Product innovation is part of product development because innovation is closely related to applying new ideas to the product, which is the same as developing new products.

6. **Mediation Effect of Product Innovation on The Relationship Between Knowledge Creation and Product Development**

Table 6 shows that the t-value and p-value for H6 are 1.683 and 0.093. This shows that H5 is accepted because the t-value is > 1.65 and p-value < 0.10. These results mean that knowledge creation has a significant effect on product development through product innovation mediation. In other words, knowledge creation has an indirect effect on product development.

7. **Mediation Effect of Product Innovation on The Relationship Between Knowledge Sharing and Product Development**

From the results obtained, it is known that the t-value and p-value for H7 are 2.334 and 0.020. Based on these results, It signifies that H7 is accepted and demonstrates that knowledge sharing has a significant effect on product development via product innovation mediation.

The findings of Hypotheses 1 and 2 indicate that knowledge creation and knowledge sharing have no direct impact on product development. Meanwhile, the results of H6 and H7 show that the relationship between knowledge creation and product development, as well as the relationship between knowledge sharing and product development, are mediated by product innovation. The results of H1 and H2 demonstrate that the two independent variables have no direct effect on product development, which may be due to the presence of a mediator in the relationship. And this is shown by the results of H6 and H7 which show that product innovation is a mediator between knowledge creation and knowledge sharing with product development.

In developing a product, food and beverage R&D will add or substitute ingredients or processes to the product. The replacement or addition of materials or processes is aimed at improving product quality, making processes more efficient, or developing product variants. Generally, this is done in the development of existing products.

Meanwhile, R&D is also developing completely new products. This product development usually combines market trends and the latest technology, resulting in products that have never been on the market before. Both of these product developments, apply the concept of innovation in practice. Thus, product development is closely related to product innovation. In other words, you can't develop a product without innovation in it.

The knowledge obtained by R&D from the results of knowledge creation and knowledge sharing, if applied to product development, which means implementing new ideas or processes in it, means doing product innovation. Therefore, product innovation becomes a mediator between knowledge creation and knowledge sharing with product development.

Product innovation is crucial in product development. By innovating in product development, the product has added value that competitors do not have. By doing product development, R&D is simultaneously innovating. In other

words, an R&D cannot develop a product without implementing innovation in it.

CONCLUSION

Based on research problem, objective, and data processing that has been done by distributing online questionnaires, obtained 50 respondents from R&D executives of food and beverage companies in Jakarta. From the data obtained, it is then processed using SMART-PLS. Validity test, reliability test, descriptive test, and hypothesis test are conducted. Hypothesis testing was conducted with a significance level of 10%. The outcomes of hypothesis testing are : 1) knowledge sharing has no significant effect on product development, 2) knowledge creation has no significant product development, 3) knowledge creation has a positive effect on product innovation, 4) knowledge sharing has a positive effect on product innovation, 5) product innovation has a positive effect on product development, 6) knowledge creation and product development are mediated by product innovation, and 7) the relationship between knowledge sharing and product development is mediated by product innovation

Based on it, can be concluded that knowledge creation and sharing have no direct influence on product development. Knowledge creation and knowledge sharing affect product development, mediated by product innovation. In this study, the scope of research, independent variables, and indicators used are limited. In further research, researchers can expand the research area, so that the data obtained are more varied and the results obtained can describe the situation in a wider scope. Also, the researcher can add research variables and their indicators.

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