

# Improving Firm Performance Through Knowledge Management and Open Innovation

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## Abstract

This research examines the relationship between Knowledge Management and Open Innovation on Firm Performance. The company's performance results from measuring the operational and financial performance. In this pandemic, the performance of the national shipping industry is quite a under pressure due to the existence of regulations for the Compliance of Restrictions on Community Activities (PPKM). For this reason, this study aims to find out how knowledge management and open innovation influence the performance of companies in Indonesia. The research was conducted in 2020, and the scope of this research is 126 Indonesian companies engaged in the shipping industry. The research method used is quantitative with descriptive and inferential statistical data analysis techniques, namely, regression analysis. The results obtained indicate that knowledge management and open innovation positively influence the company's performance. It reinforces that knowledge management and open innovation impact company performance to pay special attention to the development of knowledge and innovation of employees.

## Keywords

Firm performance, knowledge management, open innovation.

## 1. Introduction

In the wake of the Covid-19 epidemic, there has been a reduction in shipping, and the usage of ships has not been ideal. In the current period, shipping firms have canceled 21 cargo for the US-Asia Pacific trade channel owing to a lack of demand for commodities transportation in China, according to data from Ship-Technology International. This cancellation adds to 66 cancellations in the first quarter of this year. The Asia-Europe trade route saw 61 shipment cancellations, which resulted in a loss of 151,000 TEUs in available cargo capacity. The goal is to prevent the coronavirus from spreading further, and some ports have placed limits on their cargo traffic. Because of this, the global freight transportation network (exports – imports) is adversely affected. Indonesia is no exception when it comes to the export and import sector. According to industry data, the quantity of commodities shipments exported and imported by Indonesian shipping firms has decreased in recent years(Harijanto, 2020).

The national shipping industry also felt pressure during the COVID-19 pandemic. Implementing the rules for the Implementation of Community Activity Restrictions (PPKM) and the closure of ports caused passenger transport vessels to experience a decrease up to 75-100%. In comparison, the sector from containers to offshore vessels decreased between 20% and 50% (CNBC Indonesia TV, 2020). However, according to the Indonesian National Shipowners Association (INSA), in 2021, several opportunities can be used to recover the shipping industry after the Covid-19 pandemic.(Rinaldi Mohammad Azka, 2020). According to Asif, the company's performance implies measuring a company's operational and financial performance(Asif et al., 2020). The company's performance is a benchmark of the capital structure to increase the company's profits. To meet the needs of stakeholders, a company must achieve satisfactory business performance results, especially in the focus of return on assets, net income, sales levels, and others (Iqbal et al., 2020). It is challenging for companies to maintain good business performance in a pandemic.

In the face of the Covid-19 pandemic, a qualified knowledge system and various alternative offers are needed to get out of existing problems. Understanding knowledge management is essential to working in a successful organization. Understanding knowledge management is applying, creating, and communicating knowledge to improve the company or employee performance. Knowledge management is a process in the form of practice to unlock the intellectual

potential of the company through effective and efficient management of the company's knowledge management. Regarding knowledge management, the development of human resources capacities is carried out by organizing various training courses, both soft and hard, regularly throughout the company. Knowledge is considered an essential asset of an organization because it has a positive effect on achieving competitive advantage and increasing innovation that can lead the organization towards superior performance to improve its performance.

During the current pandemic, people are focused on supporting productive activities in society through new ways, such as market digitization through market web development. Open innovation is a distributed process based on the flow of knowledge intentionally managed across organizational boundaries and has become a widely recognized business strategy in many industries (Ahn et al., 2015). Shipping companies must have an innovation strategy that can improve company performance. Several studies show that open innovation has a significant impact on company performance (Bigliardi et al., 2020; Moretti & Biancardi, 2020)

### **1.1 Objectives**

This research is essential because it increases profits and competes with competitors. A company needs a close integration between knowledge management and open innovation that can make decisions about the use of services by consumers so that the profits from the company can continue to grow and have an impact on the good. Company performance. Meanwhile, the purpose of this study is to analyze the effect of knowledge management on company performance and analyze the effects of open innovation on company performance in the context of the national shipping industry

## **2. Literature Review**

### **2.1. Firm performance**

Wang, Wang, Cao & Ye (2016) revealed that company performance is the implication of measuring a company's operational and financial performance. The company's performance is a benchmark of the capital structure to increase the company's profits that continue to grow. To meet the needs of stakeholders, a company must achieve satisfactory business performance results, especially in the focus of return on assets, net income, sales levels, and others (Wang et al., 2015). Based on the above description, it can be concluded that the company's performance is essential for a company to meet the needs of stakeholders such as employees, customers, employees, owners, etc. The regular profits, companies must be able to improve company performance, for example, through increased awareness, good knowledge, and innovation according to market situations and customer wishes.

Because businesses have various and usually contradictory objectives, the definition and evaluation of performance may be difficult for academics to achieve (Deng et al., 2000). Performance may be assessed in two ways: complex performance and smooth performance. Rugged performance can be measured using a variety of methods. Raw financial figures, cost statistics, commissions, and services delivered are examples of complex performance, while soft version includes supervisor ratings, and self-perceptions are examples of smooth performance (Chow et al., 1994). Firm performance can also be divided into two categories: financial performance, which measures the firm's ability to achieve its economic objectives, and environmental performance, which measures the level of pollution emissions and ecological impacts released by container shipping (Delen et al., 2013)

### **2.2. Relationship between knowledge management and firm performance**

Knowledge management is a valuable aspect of achieving good business performance, recognized and used for effective management methods (Khammarnia et al., 2015). In addition, the importance of the dimensions of knowledge management, namely strategy, process, and measurement, in addition to explaining that: cognitive, social, and corporate learning processes are essential in the success or failure of strategic knowledge management; incentives, measures, and benchmarks help accelerate learning and cultural change (Liebowitz, 2003). Other research maintains that knowledge management is in the form of concepts and knowledge in everyone's mind and is difficult for others to understand because it is personal. And he also argues that knowledge management can bring benefits because it is necessary to encourage employee motivation through the delivery of rewards (Jain & Moreno, 2015). Based on the previous description, it can be concluded that knowledge management is helpful for companies because there is a process of regulation, distribution, and identification of intellectual assets in the achievement of the company's long-term goals. It is an arrangement of knowledge that everyone in the research carried out by Jain & Moreno (2015) found a positive impact between the organization's learning and its performance in creating knowledge financial performance (Jain & Moreno, 2015). Based on the description above, this research can formulate the first hypothesis:

H1: Knowledge management has an impact on the firm performance

### 2.3. The relationship between open innovation and company performance

Open innovation is a trending topic in innovation management, a rich concept that can be used in various ways in an organization. The idea of open innovation tends to be one of the most recent topics and has not yet been fully explored (Rexhepi et al., 2019). Open innovation requires courage from the company to be open to innovation, and it takes that courage to search and hope to find a path that can lead to new solutions. Innovative companies take advantage of the profitable opportunities available in their environment, mobilize physical infrastructure and create new forms of demand through new knowledge-intensive businesses created by existing companies. To take advantage of these opportunities, both new and established companies still have to make additional investments in innovation to develop further spillovers that can improve company performance (Banu et al., 2016). Approach to R&D activities as an open system that includes knowledge that can generate value, coming from the internal and external channels of the company dedicated to innovation. Nnamsh 2019 says that open innovation means that companies increasingly use superficial knowledge to accelerate their internal innovation processes (Umoh et al., 2019). Several studies found a relatively robust analysis of the effect of open innovation on company performance (Brown et al., 2014; Greco et al., 2020). Based on the results of the research described, this study can formulate the second hypothesis:

H2: Open innovation has an impact on firm performance.

## 3. Methodology

Research methods must be carried out clearly to obtain answers to research questions. The research method is defined as seeking solutions to answer research questions (Bairagi & Munot, 2019). In this study, causal and quantitative associative processes are used. According to Sekaran and Bougie (2016: 44), causal studies examine the effect of one variable on other variables (Sekaran & Bougie, 2016)

### 3.1. Measures

The five elements to measure the company's performance consist of 2 dimensions adopted from Jain & Moreno 2015 (Jain & Moreno, 2015) knowledge creation and financial performance. The nine items to measure knowledge management were adopted from Obeidat, Al-Suradi, Masadeh, & Tarhini (2018) [20], and the five items to measure the Open Innovation were adopted from Davoudi et al. (2018) [20]. According to Figure 1, the independent variable is knowledge management (X1) open innovation(X2), while the dependent variable is Firm performance (Y).

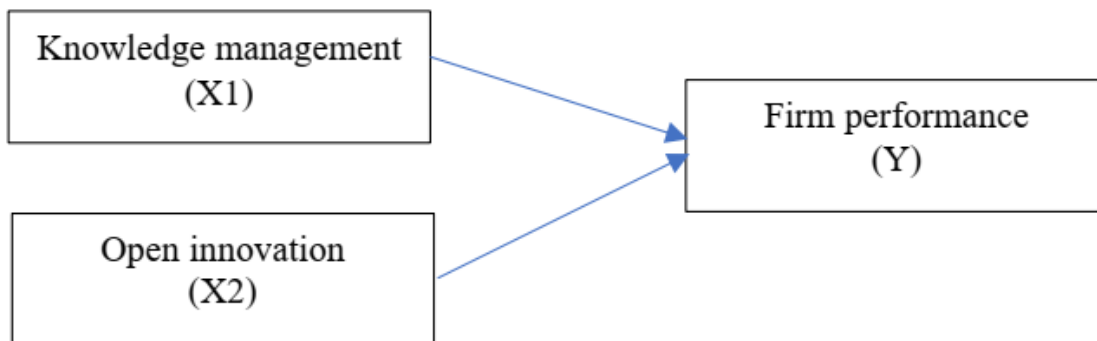


Figure 1. Research Framework

## 4. Data Collection

This study included a purposive random sample and questionnaires with Likert scale questions ranging from 1 to 5. The questionnaire was sent through email to 148 employees, using a database developed in collaboration with shipping businesses to simplify the online distribution of questionnaires to collect survey data. This study aims to ensure that each participant has at least one year of work experience. The email contains a cover letter, an explanation of the

survey's objectives, and a link to the online component of the survey. As a result, about 126 accurate replies were collected.

## 5. Results and Discussion

### 5.1. Results

The study's findings include the characteristics of survey respondents in terms of seniority, length of employment, and educational attainment. Director 2%, Senior Manager 8%, Manager 54%, Supervisor 11%, and Staff 25% were the replies by the level of seniority. The duration of work was 1-5 years in 68% of cases, 6-10 years in 17% of cases, and > 10 years in 15% of cases; High school education accounts for 14%, bachelor education accounts for 65%, and master education accounts for 21%. (For further information, check Figure 2, Figure 3 and Figure 4 below)

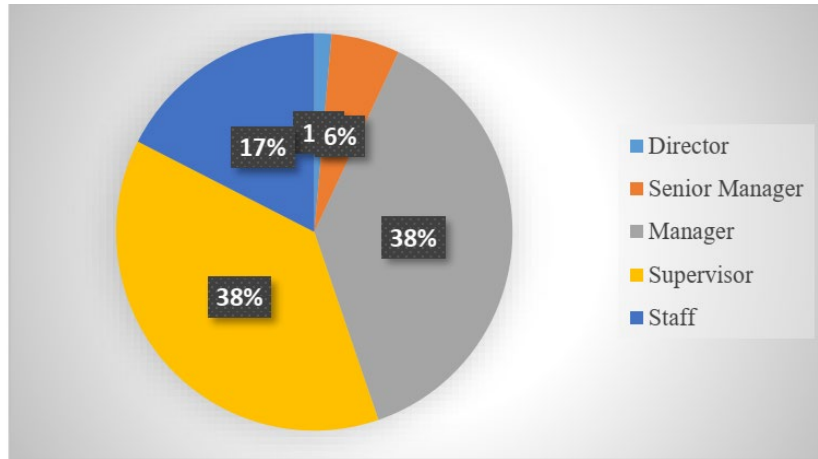


Figure 2 Seniority

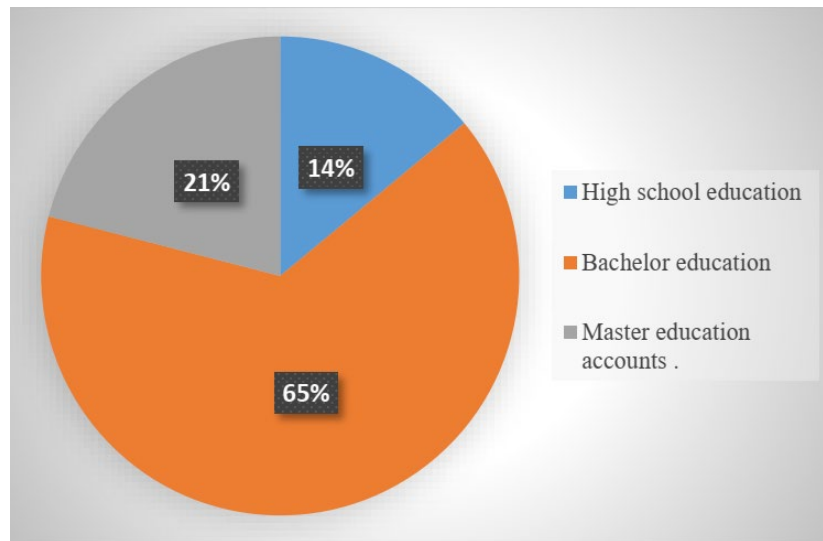


Figure 3 Educational Attainment

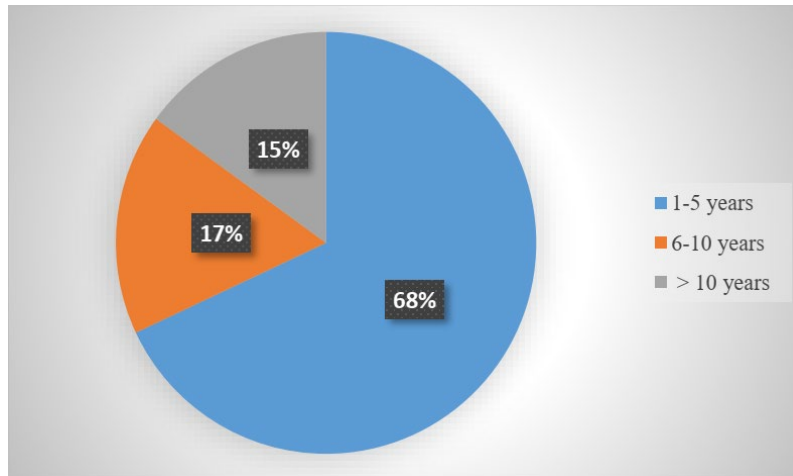


Figure 4 The duration of work

Validation and reliability tests are used in research to verify the questionnaire's findings. The firm performance variable has five factors, the knowledge management variable contains nine elements, and the open innovation variable includes five elements.

When evaluating the reliability of a construct, the value of Cronbach's Alpha must be more significant than 0.70. The value of Composite Reliability must also be more than 0.70; if the value of Cronbach's Alpha is more than 0.80, the construct is considered highly reliable. Ghozali (2012) describes a formalized formalized formalized formalized formalized (Ghozali, 2012). Results Cronbach's alpha reliability coefficients for all variables range between 0.885, 0.859, and 0.758. (For further information, check Table 1 below).

Table 1. Variables' reliability.

Variable	No. of cases	No. of items	Alpha
Firm Performance	126	05	0.885
Knowledge Management	126	09	0.859
Open Innovation	126	05	0.758.

Then, using multiple regression analysis, determine the connection between many independent and dependent variables. This study's numerous regression analysis findings indicate a positive and statistically significant relationship between the independent and dependent variables. (For further information, check Table 2 below).

Table 2 Result of multiple regression analysis

Variable	Sig	t count	Regression coefficient	Remark
X1 to Y	0,000	3,825	0,295	Significant
X2 to Y	0,000	4,945	0,539	Significant
Constanta = 28, 598				
<i>Adjusted R<sup>2</sup> = 0,487</i>				
F count = 15,654				
Sig = 0,000				

Source: Results of data processing SPSS 26 (2021)

The regression analysis determines whether the independent variables affected the dependent variable (Y). The regression data processing procedure generates R squared and conducts a t-test to see if the independent and dependent variables significantly influence each other. According to the data in Table 1, R squared is 48.7% of the coefficient of determination. This statistic illustrates the relationship between knowledge management, open innovation, and

corporate performance. In contrast, the difference of 51.3 percent is impacted by various variables. Additionally, if the knowledge management variable (X1) increases by one unit, the firm performance variable (Y) increases by 0.295. On the other hand, if knowledge management (X1) reduces by one team, firm performance (Y) decreases by 0.295.

Furthermore, if the open innovation variable (X2) increases by one unit, the firm performance variable (Y) increases by 0.539 units. On the other hand, if open innovation (X2) decreases by one team, firm performance (Y) decreases by 0.539. The knowledge management variable (X1) has a count value of 3,825 and is more than the t-table with a sig value of 0.000, which is less than alpha (0.05). And the estimated t-value for the open innovation variable (X2) is 4,945 (higher than the t-table value), with a sig value of 0.000 (smaller than alpha) (0.05). Thus, knowledge management (X1) and open innovation (X2) have a significant and beneficial influence on business performance (Y).

## 5.2. Discussion

The results of Hypothesis 1 of this study agree with the research carried out by Jain & Moreno (2015), which establishes that knowledge management significantly affects the company's performance. Knowledge management is essential in this regard, as it provides a method to organize the conversion of resources into capabilities. The knowledge acquisition dimension, which is the collection and change in problem-solving and transfer of accumulated knowledge to the company system, can improve the company's performance. Furthermore, the knowledge-sharing dimension, a knowledge-sharing activity between employees, can increase knowledge capabilities within the company.

Meanwhile, the results of hypothesis 2 open innovation significantly affect the company's performance, according to the research carried out by Brown et al., 2014; Greco et al., 2020. The focus on open innovation aims to facilitate the management of internal and external sources of information or knowledge that can be used to develop innovation within the company. A business's interaction with many innovation channels may be detrimental since this may reduce the firm's efficacy in putting innovative ideas into action. Indeed, a company that evaluates an excessive number of creative ideas and expertise obtained from various diverse innovation sources runs the danger of spreading time and resources across the process. The results show that once a business has selected specific routes through which to get information from other organizations, drawing deeper from those channels does not always result in declining benefits in the long run. Indeed, maintaining solid connections with and insourcing from firms within a specific channel may result in both management and relational advantages for the company in question. An in-depth understanding of the relational patterns in an innovation channel is likely to improve the firm's capacity to innovate and effectively counteract the weaknesses of oversearching. The results of this study strengthen open innovation that impacts the performance of the company

## 6. Conclusion

The independent variable knowledge management (X1) has a significant effect on the company's performance (Y). The regression coefficient shows that the knowledge management with a positive value can be interpreted that the increase in the direction of knowledge owned by the company will increase the value of the company's performance. The knowledge management that has been implemented has had a positive impact by increasing employees' knowledge, skills, and abilities and training in soft skills to enhance leadership programs to create new leaders who can support and improve the company's performance.

The independent variable open innovation (X2) significantly affects company performance (Y). It can be interpreted that open innovation can improve the company's performance. Open innovation is changing or creating more effective processes, products, and ideas. The main reason why companies innovate is to improve company performance, increasing the capacity of the production process to develop new products and new practices in the organization that can increase the company's ability to acquire and create new knowledge that is they can use to create other innovations. According to the results, most open innovation techniques are prone to declining marginal returns on the performance of industrial and economic innovations. Furthermore, external search breadth is inversely related to all measures of innovation performance; coupled OI is inversely associated with the development and commercialization of radical innovations; shallow search depth is not subject to diminishing marginal returns in most cases, except industrial innovation performance from incremental innovations. In addition, coupled OI is inversely related to the development and commercialization of radical innovations.

The study results reinforce that the knowledge management and open innovation that is carried out impact the company's performance so that the leadership can pay special attention to the development of knowledge and innovation of the employees in the company.

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