

# A Conceptual Framework on the Effect of Knowledge Management System Usage, Organizational Learning on Innovation and Organizational Performance

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## Abstract

*The use of knowledge management systems and organizational learning can significantly generate innovations to develop organizations. Likewise, innovation has an essential role in improving organizational performance. On this basis, this article aims to shed light on the relationship between the use of knowledge management system, organizational learning, innovation, and organizational performance. Based on an overview of the previous literature, this article presents a model by proposing factors that might influence organizational performance. Literature review was conducted to offer a proposition as an opportunity to be tested in future studies. This article analyzes the conceptual model and methodology to test the model related to the object under study, the way to obtain data, measurement of variable indicators, and methods of data analysis. Thus, it is recommended to test the proposed model using the structural equation model. It is expected that this article can facilitate and set the direction of future researches on knowledge management systems, organizational learning, innovation, and organizational performance.*

**Keywords:** knowledge management; knowledge management system; organizational learning; innovation; organizational performance.

## 1. Introduction

The rapid change in our environment certainly requires many organizations to constantly analyze and be updated about these internal and external changes. Nowadays, most companies hold onto certain knowledge as a strategy to improve their performance and to achieve their goals properly. There are various factors to influence the improvement of organizational performance, including knowledge management system, organizational learning, and innovation. Some previous studies [1], [2], [3] reveal that knowledge management systems can affect organizational performance. Organizations that implement a knowledge management system can easily store the undertaken business information, both which ends up with success and failure. The good implementation of knowledge management system can maintain all organization information and documentation safely. In some references [4], [5], [6], [7] shows that organizational learning can influence the improvement of organizational performance. Organizations with good learning capability can self-evaluate itself to avoid repeating the recurring mistakes and to have better performance. Conclusions from several studies [8], [9], [10], [11] shows that innovations in an organization can improve organizational performance. These innovations may embrace many fields such as innovations in terms of input, process, and output. Making some innovations will enable an organization to set the difference and excellence that distinguish it from other organizations as a competitive advantage to improve organizational performance.

The significant role of knowledge management system and organizational learning in generating innovation with an impact on performance has been statistically proven in the previous studies such as in [3], [4], [7], [11], [12]. On the other side,

several studies are unable to prove statistically about the effects of these variables. Part of the results of study Atalay, Anafarta & Sarvan [9] state their incapability of statistically proving about the positive relationship between non-technological innovation (organizational and marketing innovation) and firm performance. Likewise, part of the results of study Zack, McKeen & Singh [1] also fail to verify a direct relationship between knowledge management practices and financial performance. There are also studies revealing no influence between both variables, but if it is mediated by other variables, the variables will be significantly influential, as revealed by Ferraresi *et al.* [2]. Thus, it is conclusive that the direct influence between knowledge management and innovativeness remains unproven. When the strategy orientation mediates the relationship between knowledge management and innovativeness, it will only be proven that the relationship is significant. Similarly, the study cannot prove the direct influence between effective knowledge management on business performance, but when mediated by strategic orientation and innovation, the relationship becomes statistically significant. Some other findings from Gomes & Wojahn [6] also concludes that there is no effect of learning capability in organizational performance. Thus, it is justified to say that the previous studies come up with different opinions, indicating the significance to address this topic using various research subjects and different methods.

Many previous studies have addressed the four variables in this study, namely knowledge management system, organizational learning, and innovation, but separately. Study examined the effect of knowledge management on organizational innovation are [12], [13], [14]. Some previous studies [4], [12], [15], [16], [17], [18], [19], [20] examined the effect of organization learning on innovation. Studies examined the effect of

innovation on organizational performance are [8], [9], [10], [11]. Hence, it is still topical to develop a new model by collaborating the various fragmented studies into a more holistic study to propose a comprehensive model. It is expected that this article can contribute to the development of theories related to factors to improve organizational performance and achieve its objectives using many proposed strategies.

Motivated from the overview of the previous literatures, this article presents a more comprehensive model by identifying factors to improve organizational performance. This article aims to explore the relationship between knowledge management systems, organizational learning, innovation, and organizational performance. Conceptually, it will examine to see the correlation possibility between knowledge management system and organizational learning on innovation and their subsequent impacts on organizational performance.

The rest of this paper is organized as follow: Section 2 discusses the theory and review of the previous researches related to knowledge management system, organizational learning, innovation, and organization performance. Section 3 offers: (1) a proposition based on the literature review to build a conceptual model; (2) a conceptual model of the relationship between the studied variables of knowledge management system, organizational learning, innovation, and organization performance as a whole. Section 4 discusses the possible methodology to be used to test the model for further research. Finally, Section 5 concludes this work and highlight future works.

## 2. Rudimentary

### 2.1. Theory on Knowledge Management System

Organizations are required to quickly adapt to the rapid changing environmental conditions. Therefore, it is necessary for an organization to build a knowledge management system with a support of information technology to store and document things related to organizational management activities. According to Darroch [21], knowledge management plays an important role in providing a coordinating mechanism to enhance the conversion of resources into capabilities. Likewise, Yu *et al.* in [12] explained that the knowledge management system is an information system that focuses on managing the resources and processes of organizational knowledge. Iskandar in [22] discern that knowledge management system refers to the use of modern information technology such as the internet, intranets, extranets, and data warehouses to regulate, improve and facilitate intra and inter knowledge management. The knowledge management system is used as a way to achieve the goals of knowledge management applied by companies or industrial groups using information technology. The knowledge management system includes two aspects, namely the hardware aspect such as information technology equipment and software such as system flow in the organization.

Wang & Wang of [23] also explains that knowledge about companies will become an important asset for organizations. Therefore, the application of knowledge management systems will effectively support and enhance organizational knowledge management activities in many companies. Knowledge management systems is a great company resource to face the tight competition with other organizations. Santoro *et al.* [24] suggests that calling for a new and inventive knowledge management system and an open approach is an important strategy to foster knowledge in new disruptive technologies in the Internet-based era that may change the knowledge managed by organizations. By applying this strategy, the company is expected to develop its organization's internal knowledge management capacity to generate innovations.

### 2.2. Theory on Organizational Learning

To ensure organizational development, every organization is required to earnestly learn from the previous experiences.

Willingness and ability to learn shall be applicable not only at the organizational level but also at the level of individuals in the organization. Yu *et al.* in [12] reveals that organizational learning is a company attempt to utilize intellectual and individual social capital to realize the company's potential for innovation. According to Ansari & Kalantari [5], learning in organizations can be done by publishing attitudes, knowledge and mental models of the organization and based on the past knowledge and experience and this important case depends on structure of each organization, although no direction has been specified for it in most organizations. In the field of modern management, to stabilize organizational success and gain competitive advantage, the organizational learning is proposed as a strategic tool [25]. Khunsoonthornkit & Panjakajornsak [7] thinks organizational learning is done by setting the organizational philosophy and resolution to create sustainable solutions and outcomes, and to integrate and exchange perspectives between partners as a way to promote organizations. The corporate culture is done by building awareness for learning and developing in accordance with the organization's strategy to assimilate and modernize the organization.

### 2.3. Theory on Innovation

Organizational Innovation is a focal point to constantly consider by the organization since organizations will have to face the rapid changes of social demand, technological developments, and the new era of development. Innovation is a way to change organizations, in response to both internal changes and external changes in the environment or as initial steps taken to influence the environment [26]. Innovation has become the basis for achieving the best performance of the company. Innovations can be produced by companies internally or alternately companies can adopt them from external sources [11].

Atalay, Anafarta & Sarvan [9] reveal that in an increasingly changing environment, innovation can broadly be considered as one of the most important sources of sustainable competitive advantage. This is so because it can lead to improvements in products and processes, by making constant progress that helps companies survive, thus enabling faster and more efficient growth to ultimately reap higher profit than that of non-innovators.

Yu *et al.* in [12] show that in developing countries such as Asia, innovativeness is an important organizational capability for sustainable competitive advantage in a dynamic environment. In line with this, Onag, Tepeci & Basalp [20] states that innovation is the key element to improve the sustainability and success of the company.

### 2.4. Theory on Organizational Performance

It is important to measure organization performance, since good performance can constantly support the achievement of organizational goals using the available resources. Felicio, Rodrigues & Caldeirinha [27] explained that performance is a composite measure that includes indicators of growth, financial indicators and internal performance. Some qualitative indicators to be used as a measurement of organizational performance are increasing market share and increasing sales. According to Atalay, Anafarta & Sarvan in [9], the suggested performance indicators are perceived performance relative to those of the relevant competitors. Kusuma & Devie in [3] defines organizational performance as the ability of an organization to achieve its objectives by using resources efficiently and effectively. Whereas, according to Kusuma & Devie in [3], financial performance illustrates the extent to which this organization is able to meet the needs of stakeholders and their own needs to survive. In general, performance measurement can be assessed by financial performance and non-financial performance.

## 3 A Conceptual Framework on the Effect of Knowledge Management System Usage, Organizational Learning on Innovation and Organizational Performance

This section proposes a proposition to build a conceptual model and a conceptual model of the relationship between the studied variables of knowledge management system, organizational learning, innovation, and organization performance as a whole.

### 3.1. Proposition Development

#### a. Knowledge Management System and Innovation

Liao & Wu in [28] analyzes the relationship between knowledge management, and organizational learning and innovation organizations using structural equation modeling. The results show that organizational learning is a mediating variable between knowledge management and innovation organizations. Just like systems, knowledge management is an important input, while learning organizations are a key process, thus making organizational innovation as a critical outcome.

Yu *et al.* in [12] examined the relationship between entrepreneurial orientation, technology orientation, Knowledge Management System (KMS), and organizational learning to develop organizational innovation in many developing countries. The results show that the use of a knowledge management system in a company has a positive impact on organizational innovation.

Mardania *et al.* in [14], quantitatively tests the relationship between knowledge management, innovation and performance. The results reveal that knowledge management activities affect innovation and organizational performance directly and indirectly through increasing innovation capability. In depth, it is possible to conclude that knowledge creation, knowledge integration, and knowledge application facilitate innovation and organizational performance. Based on the previous studies, this article offers the following proposition.

*Proposition 1: Knowledge management system usage influences innovation.*

#### b. Organizational Learning and Innovation

Based on the theory and various previous studies, organizational learning can increase the organization's ability to innovate. This innovation is a key factor in an organization to improve its performance to have the competitive advantage amidst the tight competition with other organizations. Jiménez & Valle [4] that examines innovation, organizational learning, and performance, draws a conclusion that is in line with [12] indicating that organizational learning influences innovation. The results of these studies are in line with [15], [16], [17], [18], [19] which also conclude that organizational learning is positively related to innovation. Onag, Tepeci & Basalp [20] examines organizational learning capability and organizational innovativeness by addressing the effect of organizational learning capability on organizational innovativeness. The results indicate that the dimensions of organizational learning capability significantly influence organizational innovation. Thus, it is possible to recommend the following proposition.

*Proposition 2: Organizational learning influences innovation.*

#### c. Innovation and Organization Performance

Innovation plays a key role for organizational success, because it enables organizations to deal with the rapid changes in the environment. Rubera & Kirca [8] reviews meta-analysis and integrates various theories related to firm innovativeness and performance. The results of the meta-analysis indicate that firm innovativeness indirectly affects firm value through market position and financial position. Atalay, Anafarta & Sarvan [9] examined the relationship between innovation and company performance. It reveals that technological innovation consisting

of product and process innovation has a significant and positive impact on firm performance, but it fails to find any evidence for a significant and positive relationship between non-technological innovation (organizational and marketing innovation) and firm performance. Research by Tsai & Yang [10] that refers to contingency theory and interactional perspectives, develops a conceptual framework to investigate the interaction between market turbulence and the fact that intensity of competition can moderate the relationship between corporate innovation and business performance. The conclusions indicate that the effects of corporate innovation on business performance lead to various result in different configurations of market turbulence and competition intensity. Articles by Ali, Kan & Sarstedt [29] also examine the relationship between absorptive capacity, organizational innovation and organizational performance. The study concluded that three of the dimensions of absorptive capacity, namely acquisition, assimilation, and exploitation, have an influence on innovation and in turn improve organizational performance. Based on the previous studies, the study by Hanif *et al.* [11] also supports that innovation generation and innovation adoption have positive impact on firm performance. Valle *et al.* in [15] concluded that organizational learning and innovation contribute positively to business performance. Thus, it is possible to offer the following proposition.

*Proposition 3: Innovation influences organizational performance.*

#### d. Knowledge Management System and Organizational Performance

There is a direct relationship between the knowledge management system and organizational performance. Organizations that implement and use knowledge management systems certainly aims to achieve organizational goals by pursuing the best organizational performance. Zack, McKeen & Singh [1] reported the results of exploratory investigations regarding the organizational impact of knowledge management. However, there is no direct relationship found between the practice of knowledge management and financial performance. The practice of knowledge management is found to be directly related to organizational performance which in turn is directly related to financial performance.

Ferraresi *et al.* in [2] concluded that effective knowledge management contributes positively to strategic orientation. Although there is no significant direct effect of knowledge management on innovation, this relationship is significant when mediated by strategic orientation. Effective knowledge management does not have a direct effect on performance, but the relationship becomes statistically significant when mediated by strategic orientation and innovation.

Kusuma & Devie [3] tried to test whether there is a significant influence between knowledge management on competitive advantage and company performance using Partial Least Square. The study shows that knowledge management has a significant influence on competitive advantage and company performance. Based on the review of several studies, the following proposition is offered.

*Proposition 4: Knowledge management system usage influences organizational performance.*

#### e. Organizational Learning and Organizational Performance

There is a direct correlation between organizational learning and organizational performance. Jiménez & Valle in [4], concludes that organizational learning and innovation variables contribute positively to business performance. Organizational learning also affects the level of innovation.

Ansari & Kalantari in [5] tried to examine organization in the Tehran Stock exchange and saw the relationship between organizational learning and value of companies accepted. The results show that there is a significant and positive relationship

among all the criteria considered in organizational learning and company value on the Tehran Stock Exchange. Gomes & Wojahn [6] analyzed the effectiveness of organizational learning capabilities in innovative performance and organizational performance of small and medium-sized enterprises and [7] analyzed the impact of learning organization and commitment on research performance and development of organizations in Thailand. The results show that learning organizations have a direct effect on organizational commitment and performance. Valle *et al.* [15] concluded that organizational learning and innovation contribute positively to business performance. Based on the results of several previous studies, the following proposition is offered.

**Proposition 5:** *Organizational learning influences organizational performance.*

### 3.2. Conceptual Model

Figure 1 presents the conceptual model of the relationship between variable of knowledge management system usage, organizational learning, innovation and organizational performance.

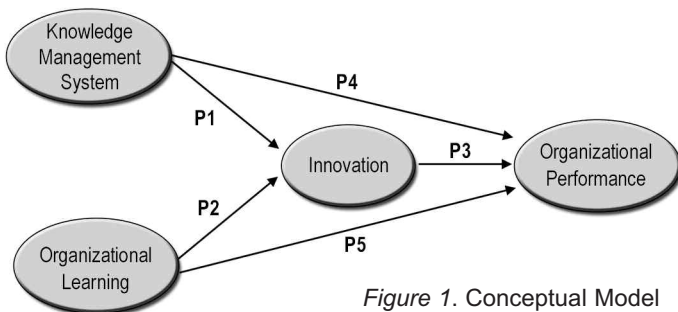


Figure 1. Conceptual Model

#### a. Discussion on Figure 1

Based on the literature analysis and several propositions in this article, it is possible to develop an empirical study that analyzes the influence of the use of knowledge management system and organizational learning on innovation and their subsequent impact on organizational performance.

Figure 1 above depicts our proposed conceptual model. The P1 proposes the relationship between the knowledge management system usage and the innovation. There is a possibility that the better the use of a knowledge management system in an organization the better the urge of organizations to innovate. The P2 proposes the relationship between organizational learning and Innovation. There is a possibility that the learning conducted by all components in the organization will encourage organizations to innovate. The P3 proposition is a relationship between innovation and the organization performance. There is a possibility that the various kinds of innovation selected by an organization will improve organizational performance. The P4 proposes the relationship between the knowledge management system on the organizational performance. It is implied that the use of a knowledge management system can directly improve organizational performance. The P5 proposes the relationship between organizational learning and organization performance. There is a possibility that the learning process carried out by the organization will improve organizational performance because the organization has more experience and learning process in making decisions.

#### b. The comparison between the proposed conceptual model with the previously proposed models

Table 1 shows the comparison between variables used in the conceptual model proposed in this article with those used in the previous studies.

| No. | Variable / Indicator              | [2] | [8] | [12] | [14] | [24] | Proposed Model |
|-----|-----------------------------------|-----|-----|------|------|------|----------------|
| 1   | Knowledge Management System Usage | Yes | No  | Yes  | Yes  | Yes  | Yes            |
| 2   | Organizational Learning           | No  | No  | Yes  | No   | No   | Yes            |
| 3   | Innovation                        | Yes | Yes | Yes  | Yes  | Yes  | Yes            |
| 4   | Organization Performance          | Yes | Yes | No   | Yes  | No   | Yes            |

Table 1. Comparison between variables analyzed by the previous researches

There are several previous studies that discuss related variables proposed in the concept of this study. However, the previous researches model separately examined the variable of knowledge management system usage, organizational learning, innovation, and organization performance. The model developed in [2], [14] discusses variables related to knowledge management system usage, innovation and organization performance, but does not relate to organizational learning. Rubera & Kirca [8] discusses the relationship between innovation and organization performance variables but does not relate them to knowledge management system usage and organizational learning. The model developed in Yu *et al.* [12] addresses knowledge management system usage, organizational learning, and innovation, but does not associate it with organizational performance. Meanwhile, Santoro *et al.* in [24] analyzes the variable of knowledge management system usage and innovation but does not relate it to organizational learning and organization performance. In this article, a model is developed by considering all variables, namely the variable of knowledge management system usage, organizational learning, innovation and organization performance. Thus, the advantages of the conceptual model proposed in this article over the previous studies is the more complete and comprehensive formation of a new model by analyzing the relationship between the four variables that have never been studied before.

### 4. Discussion

Various factors that affect the organization performance will always be the concern of the organization manager. Organizational performance, be it financial performance or operational performance is the key factor to take heed in the organization. Therefore, an organization leader is entitled to analyze and master any factors that can improve organizational performance. Good performance enables the organization to achieve its goals by using the available resources effectively and efficiently. One of the much-needed resource today is knowledge. Maximum use of knowledge can create competitive advantages, which may have an impact on performance. To maximize organizational knowledge, the organization is required to form or use a knowledge management system to carry out collective management of knowledge. The knowledge management system can help organizations to collect, manage, and disseminate all knowledge and information obtained by the organization. Thus, the optimum use of knowledge management system will improve the organizational performance.

Organizations and the individual elements within an organization will have to face various types of events and activities to achieve organizational goals on a daily basis. As time goes by, there will be a learning process in the organization, which depends on the capacity of each organization. The learning process will be ensued with a process of changing the organization or individuals knowledge. The provision of knowledge from the learning process will affect organizations and individuals in the organization in making decisions, overcoming problems, and evaluating the achievement of organizational goals. The benefit of organization learning lies on its increasing ability to choose various strategies to respond to changes in the organization environment quickly and precisely. The selection of the right strategy will also have an impact on

creating competitive advantage and impact on improving performance.

Amidst the current era of uncontrolled competition, all parties are required to adapt to the latest technological developments. The knowledge management system will be easily applied using information technology. Therefore, organizations will have to prepare technological information facilities and infrastructure in the form of both hardware and software, establish the implementation and documentation procedures for all information, and link the system with all organizational stakeholders. By constantly applying knowledge management system in an organization through socialization, analysis, forum evaluation, the organization will experience learning process. Thus, the use of a knowledge management system and the implementation of organizational learning will make it easier for organizations to choose appropriate strategies through the availability of complete information and experience. One option of strategic opportunity is a strategy to innovate, since appropriate innovation can turn ideas into profits.

In his book [30] explains that innovation is the initial commercialization of inventions by producing and selling a new product, service, or process. There are two types of innovations namely incremental innovation and breakthrough innovation. Incremental innovation is a simple change in the product, service, or process. Breakthrough innovations show higher innovation leaps towards improvement of products, services, or processes within the company. On the other side, applying the innovation development strategy is not easy. Cozijnsen, Vrakking & Ijzerloo by [31] on companies / projects in the Netherlands revealed that 39% of innovation projects ended up with failure. Thus, it is important to use the knowledge management system and the appropriate implication of the organizational learning process.

The performance of the organization can be seen from its financial or non-financial performance. One aspect of financial performance is profitability, while non-financial performance is reflected in the growth of the organization, the level of customer satisfaction, labor conditions, service, product quality, and others.

It is possible to test the presented conceptual model in Figure 1 using the existing field data. Several factors might moderate the relationship between variables. As illustrated in Rubera & Kirca [8], the organizations studied can be divided into large groups of organizations or small groups of organizations, groups of high-tech or low-tech organizations, and groups of organizations in western or non-western countries. The innovation variable also has two choices, be it the incremental innovation or radical innovation.

Data were collected through questionnaires. The following presents the measuring indicators to be used in a questionnaire.

To measure knowledge management system, we can use indicators as in the Santoro *et al.* [24]. It is possible to see knowledge management system from 3 dimensions:

a. Dimensions of Information Technology infrastructures :

- The amount of funds spent for new information technology hardware and software.
- The use of extranet.
- The use of intranet.
- The use of LAN.
- The use of website

b. Dimensions of collaborative technologies:

- Discussion forums.
- Shared databases.
- Document repositories.
- Workflows.

c. ICT (Information and Communication Technologies) adoption:

- The use of ICT to inform employees or receive information from employees.
- The use of ICT to exchange knowledge and information with customers.

- The use of ICT to exchange knowledge and information with suppliers, competitors and partners.

To measure organizational learning, we can use indicators as in the Yu *et al.* by [12], which measures organizational memory (composite reliability = 0.80; AVE = 0.57). The followings are the list of possible questions to ask:

- We widely share the institutionalized routines among our employees and groups.
- We have a knowledge base for reference when we analyze the needs of our customers.
- We have a knowledge base for reference to deal with the repeated problems.

Measurement of organizational innovativeness (composite reliability = 0.87; AVE = 0.62) in Yu *et al.* by [12] addresses the following questions:

- We are fast to respond to our customers.
- We are fast to introduce innovative products or services.
- Innovation is encouraged in our firms.
- Our firm is reputable as an innovator in our industrial sector.

To measure performance, we can use the indicators used in the Mardania *et al.* by [14].

The question to ask is "compared with the key competitors, your company performance:

- Grows faster.
- Is more profitable.
- Achieves higher customer satisfaction.
- Provides higher quality products.
- Is more efficient in using resources.
- Has internal processes oriented to quality.
- Delivers orders quicker.
- Has more satisfied employees.
- Has more qualified employees.
- Has more creative and innovative employees.

After collecting data, we can use Confirmatory Factor Analysis (CFA) as a hypothesis testing to measure the validity of the model in accordance with empirical data. Afterwards, we can process data to test the model using Structural Equation Modeling (SEM), which can lead to path analysis to test the model as a whole.

## 5. Conclusion and Future Works

The concept of knowledge management system usage and organizational learning are still topical to analyze to determine its impact on innovation and organization performance. Information and knowledge that an organization receives from the learning process is a valuable asset to be well documented in a knowledge management system. Providing that both factors go well, the organization will be more encouraged to carry out continuous innovation to improve its performance.

This article can greatly contribute to future researches since it has presented a complete proposition, conceptual model, variable measurement indicators, alternative research objects, and suggestions on how to analyze the data. It is recommended that further research can test this model empirically according to the applicable situation and conditions. There are several things to develop from this model. First, future researchers have the option to test large, medium or small-scale organizations. Second, the future researchers are free to choose several existing industrial groups such as trading, service, or manufacturing companies. Third, it is possible to select the object of research in the same industry group, be it the group of companies with high technology or low technology. Fourth, it is possible to select the object of research in industrial groups located in different parts of the world, be it the western or non western countries. Fifth, it is possible to examine organizations facing rapid or stable environmental changes. Finally, it is also possible to add various moderating variables to strengthen the relationship between these variables such as market turbulence, organizational commitment and absorptive capacity.

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