The Effect of Information and Communication Technology-Based Knowledge Management on Employee Innovation to Solve Work Problems

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Abstract. Information technology-based knowledge management can improve employee performance innovation. This research aims to find many studies that deal with knowledge management based on information technology and innovation of employees to solve the problems they face. This research is a review of articles published in various newspapers. Articles used in this search are search results from electronic data using keywords knowledge management, knowledge creation, knowledge sharing and enrichment, information storage and retrieval, dissemination of knowledge, speed of innovation, news quality, and new figures. The results of the study show that knowledge management has a significant impact on the speed, quality, and quantity of innovation of the employees who work in the workplace.

1 Introduction

Employees are the main actors in every activity in an organization. They face changing problems daily, and many new things are found. This is often experienced by employees who work in fields directly related to fulfilling human needs. Changes occur rapidly, for example, in cell phone companies, advertising, creative industries, and the arts. Usually, companies in this field try to serve the desires of their consumers directly. Employees in the company are always required to have up-to-date knowledge. To meet these needs, employees must be able to innovate to keep up with changes that occur quickly. Information technology is currently a significant human need in big cities in particular. Almost every activity is carried out with the help of information technology. Information technology has been widely used to store and distribute knowledge and the latest technological discoveries. Company employees in a meeting need to "update" knowledge about their work and are required to be able to maximize the function of information technology.

1.1 Knowledge Management

Knowledge Management is the practice of turning an organization's intellectual assets into business value. Organizations use Knowledge Management for two main reasons:

- Improve the organization in general or solve some problems,

- Organizational improvement knowledge management is a comprehensive business, company, or departmental level that is important for using knowledge management [1].

The type of knowledge is soft and clear [2]. In different organizations, clear information, for example, is a document used in the process. It can be stored and given some code. Meanwhile, tacit knowledge is the knowledge that is always in the mind of the owner of the knowledge. Clear information can be stored to make it easier to use. Tacit knowledge is constantly and profoundly changing, rooted in the experience of the knowledge owner [3]. Tacit knowledge is stored in the mind/thoughts/ideas and has not been poured in any form, so it is still owned by that person. Meanwhile, explicit knowledge is the knowledge that has been poured by the owner into a written form or other forms that can be seen and read so that it is understood by others. A complete Knowledge Management must contain four elements.

Knowledge Creation and Capture

Knowledge is created as a result of the relationship between people and groups, communities, or organizations to create knowledge. One of the main objectives of knowledge management is to capture the knowledge generated during these interactions [4].

Knowledge creation can occur in the process of Socialization (Tacit to Tacit) – Interaction is the activity of acquiring knowledge in physical proximity, where activities are carried out by interacting directly to acquire knowledge. Direct communication can be with people outside or inside the organization or connecting with other departments or work groups. For instance, talk to your colleagues. Tacit knowledge is transferred through joint work within a company, such as living in the same place.

Externalization (Tacit to Explicit) – Outsourcing is the act of bringing tacit knowledge to light, where knowledge is created so that others can share it and become the basis for new knowledge. External activities can publish documents (processes, journals, books) or disseminate knowledge. Examples of external outputs are ideas, drawings, or written documents.

Combination (Explicit to Explicit) – Synthesis is the work of knowledge organization and integration, which combines different types of knowledge. The use of computer communication networks and large databases can facilitate this type of information exchange. Tacit knowledge is collected inside or outside the organization and combined, transformed, or organized to create new knowledge. New knowledge is shared transparently among the members of the organization.

Internalization (Explicit to Tacit) – Internalization is the act of receiving and applying one's knowledge by reading and learning while doing the job. Soft knowledge is part of individual knowledge and is valuable to the organization. Internalization is a continuous process of individual and collective learning and the ability to see relationships and recognize patterns, and power understands domains, concepts, and ideas [5].

Knowledge Sharing and Enrichment

Internalization is the act of receiving and applying one's knowledge by reading and learning while doing the job. Soft knowledge is part of individual knowledge and is valuable to the organization. Internalization is a continuous process of individual and

collective learning and the ability to see relationships and recognize patterns, and the ability to understand domains, concepts, and ideas. The principle of sharing and using knowledge is found throughout the organization. This can be supported by providing incentives for those who actively share valuable knowledge and those who often use shared knowledge.

Information Storage and Retrieval
There are four main options for storing information that is used for sharing later when it is used. These options are:

- file storage (local and network directories and folders);
- data backup;
- e-mail; and
- websites (intranet and external) [4].

The process of retrieving information is easier and faster if it is stored in a small format. Information should be divided into smaller units that can be easily managed, and each segment according to its type for further storage and storage. Once stored in memory, information is created and published. The next step is to provide the user with different ways to access the desired information.

Knowledge Dissemination
Oral books, seminar presentations, websites, posters, programs, magazines, and libraries are popular forms of media. Participating in external publication networks, building relationships with other organizations, and creating knowledge centers are also effective ways to share knowledge [4].

Figure 1 presents a conceptual model of the relationship between knowledge management variables and innovation performance variables. There are four knowledge management variables, namely, knowledge creation, knowledge sharing and enrichment, storage, and information retrieval and dissemination. The innovation variables of user performance are measured based on the speed of innovation, the quality of innovation, and the number of innovations. A variable analysis is possible for topic name 1 to discuss more than one knowledge management variable and for new variables, allowing the topic name to discuss several new variables.
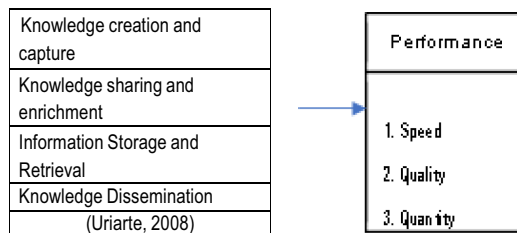
Fig. 1. Conceptual model of the relationship between knowledge management variables and innovation performance variables

1.2   Basic Elements of Knowledge Management

- Person
     Knowledge Management comes from people. People are subjects that form new knowledge.
- Information Technology
     Information technology is one of the key elements in knowledge management. Information technology is known as a media system that facilitates communication, especially clear information [6]. According to [7], information technology and experiences that have been formed by previous experts are taken into consideration for the formation of information technology itself.
     Information technology that supports knowledge management will constantly evolve to simplify the communication process. One of the latest information technologies that many companies now use for communication is the intranet, which is based on the need to access information and collaborate, communicate and share knowledge online.
- Process
     This process includes capturing, filtering, preparing, changing, and sharing knowledge in all parts of the organization and prepares it for implementing specific processes and procedures.

1.3   Innovation

Innovation comes from the words "in" and "novus" and "in-novatus" which means renewal, making new, and changing. Innovation in the big Indonesian dictionary means introducing something new. In addition, innovation means the introduction or introduction of new things; renewal. Innovation is a way to change the organization or in response to internal or external changes or as a barrier designed to affect the environment [8]. The classification of innovation, according to [9], has three aspects.

Speed Innovation
The speed of innovation is the time spent in initial development, conceptualizing and defining innovations, and commercializing new products or services to the market [10]. Speed of innovation is an ongoing process that demonstrates the company's ability to increase activities and services, creating a competitive advantage over competitors in areas with short product life. The pace of innovation gradually shifts from traditional sources to strategic focus. This concept is especially suitable for the rapidly changing business environment [9]. The speed of innovation is an essential competitive factor in the market and can lead to higher performance. Demonstration studies confirm a positive relationship between speed to market and the success of new products. In addition, increased competition, technological and market developments, and shorter product life force companies to innovate faster [11]. The speed of innovation can be achieved in teams with complex social skills, so competitors cannot easily create or imitate it [12]. New software that can be accessed by different organizations allows companies to be closer to customers based on their needs [13]. In addition, increased competition, technological

and market developments, and shorter product life force companies to innovate faster [14].

Quality Innovation

In terms of products or services, the quality of innovation can be defined by various variables such as performance, service, reliability, time, cost, complexity, level of innovation, and customer value [9]. The quality of innovation can be obtained from the collection of innovation in any area of an organization by comparing the results, whether products, processes, or new services, and the ability to take into account the creation process [15]. The quality of innovation can be viewed from various different perspectives by each person who uses it. Therefore, in determining the variables, it must be mutually agreed upon first.

Innovation Quantity

The rate of innovation is defined as the number of new or improved products or services in the market that is higher than the industry average [9]. It is also defined as the number of new systems developed and above the industry average. The interest in organizational structure and knowledge management is driven by the potential benefits of increased productivity and productivity in products and services [16].

Innovative performance is the result of work that, in its implementation, is accompanied by the application of new things in an effort to improve quality. Innovativeness is a trait that describes a task or job that is done in a different way or by using assistance by utilizing and applying new things, either in the form of ideas, methods, or new products in carrying out work to improve the quality of education or learning.

Innovation is inseparable from technological development. The results from the previous study show that in low information technology situations, new performance improvements are achieved through the development of intelligent service models. Meanwhile, in the field of advanced information technology, new efficiency improvements are achieved by increasing the number of intelligent functions [17]. The results show that knowledge management plays an essential role in innovation and business activities, both in product development, marketing, and services. (Musannip et al., 2019). Knowledge management is a knowledge management process that is expected to make it easier for the users of that knowledge to be managed.

Knowledge management starts from creating knowledge, sharing and enriching knowledge, storing and retrieving knowledge, and publishing it. The study of knowledge management has been widely discussed in various studies, both about the process and its benefits. However, the discussion is still partial and incomplete. Thorough research on knowledge management is still very little. In addition, the study did not explain whether the implementation of knowledge management using information technology? This paper will show an overview of current research on knowledge management and whether or not to use information technology in the management process. The research was conducted using a literature study.

1.4   Scope and Research Questions

The purpose of this study aims to determine the role of knowledge management based on information technology and the speed, quality, and quantity of innovations introduced. A review will be carried out on papers published between 1997 and 2009. As an initial approach, there are several things that need to be understood first.

1. What is knowledge management?
2. How to manage electronic-based knowledge?
3. What is performance innovation?
4. Is there a relationship between knowledge management and employee performance innovation?

2   Methodology

The journals used in this study were taken from an electronic database with the keywords knowledge management, information and computer-based knowledge management, and employee performance innovation. The journal was published between 1990 and 2020. The keywords used are adjusted to the theory of the knowledge management process, as described in Fig. 1.

3   Findings

Found as many as 30 journals that contain keywords that match what you are looking for. Based on this number, it is divided into:

1. 9 journals that discuss the process of knowledge creation.
2. 9 journals that discuss the process of sharing and enrichment.
3. A journal that discusses the process of storing and retrieving as much as
4. 2. Journals that discuss the process of disseminating information, as many as 5 and
5. 2 journals that discuss information and communication technology.
6. There are no journals that thoroughly discuss the knowledge management process (4 knowledge management processes).
7. Most studies only use 1 process, which is used as a research variable
8. The number of journals found is minimal when viewed from the range of years used (1997 to 2009)
9. the opportunity to conduct research on knowledge management is still very open (Table 1).

Table 1. List of Journals used as a sample

JOURNAL NAME	Amount
ACM	1
Asian Journal of Economics, Business, and Accounting	1
Creativity and Innovation Management	1
Economics and Sociology	1
IBM System Jurnal	1
IJTM (International Journal of Technology Management)	1
Information and Management	1
International Journal of Academic Research in Accounting, Finance and Management Sciences	1
International Journal of Higher Education	1
International Journal of Manpower	1
International Journal of Production Economic	1
Journal of Applied Knowledge Management	1
Journal of Business and Management Sciences	1
Journal of Product Innovation Management	1
JSTORE	1
Jurnal Pendidikan Teknologi Informasi	1
Knowledge Management Research & Practice	1
Long Range Planning	1
Management Science	1
Rekhne	1
The International Journal of Management Science and Information Technology (IJMSIT)	1
The International Technology Management Review	1
Journal of Business Economics and Management	1
Journal of Business Research	4
Journal of Enterprise Information Management	1
Journal of Knowledge Management	4

4 Conclusion

Workers in the field of economy and business today are always required to innovate. The process of innovating using information technology is a must because it takes speed to get data and information so that workers can immediately innovate based on the data

obtained. The results showed that knowledge management associated with information technology became a very good combination to improve employee performance innovation. Knowledge management with information technology can provide information quickly with much information and good quality.

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