

# Conceptual Framework of Knowledge Transfer for Applying Digital Tools: A case study of Petrochemical company in Thailand

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## Abstract

*This study is qualitative research. It aimed to develop a conceptual framework about factors affecting the success of knowledge transfer to enhance the competency of applying digital tools for non-IT employees, a case study of a petrochemical company in Thailand. The research methodology consists of review of literature, theories, and related research, as well as interview with experts. The research results revealed that the conceptual framework of factors affecting the success of knowledge transfer for enhancing the competency of applying digital tools for non-IT employees consisted of knowledge transferor, knowledge receiver, technology characteristics, transfer process, and organizational context. They can enhance digital competency and lead to business outcomes.*

**Keywords:** Knowledge transfer, Digital tools, Conceptual Framework

## 1. Introduction

Most businesses know that digital transformation is important. Over the past few years, many of the world's leading organizations have experienced significant turnover growth, with data from Accenture Research from 2019 to 2021 showing that digitally transformed organizations, a gap in earnings growth compared to organizations that are just starting to digitally transform is even wider by increasing from 2 times to expanding to 5 times. Obviously, the business transformation to digital has a great impact on business

growth (Paul Daugherty et al., 2021). Corporate executives do not determine the issue of digital transformation just as a matter of organizational transformation but also defined as an important “core strategy” for the business to move forward steadily (Ragu Gurumurthy et al., 2022). However, one of the important problems of digitalization to keep pace with the digital age is the lack of direct digital personnel who will develop various digital systems for the organization. One solution to this problem is to encourage non-digital professionals to develop digital systems through digital tools for user adoption, known as No-Code Development Platform and Low-Code Development Platform to help people without programming knowledge to create websites and software on their own without the need for users to have knowledge of coding. This will increase speed and flexibility and reduce the cost of digital development. According to IDC Asia Pacific, there will be a new generation of developers building applications without writing code. These developers will drive digital transformation (IDC's Asia/Pacific Enterprise Software Survey 2019). There are many factors that contribute to this success. The important thing is knowledge transfer (Bacon, 2020), as well as the context within the organization that must be conducive to the development of digital competency (Rossmann, 2018), which will lead to business outcomes (Sanjay Mathrani et al., 2013 & Jan et al., 2004).

For the petrochemical business, there is a tendency to become more competitive due to increasing production volumes in many countries around the world, including Thailand. The petrochemical business must have a strategy to increase its competitiveness. One of the important policies of the organization is building personnel to have digital competency. Most personnel must have the knowledge and digital skills, as well as the acceptance of digital tools to be applied effectively (Raija Hamalainen et al., 2021). Although information technology personnel play an important role in developing the readiness of digital technology for the organization; however, most personnel of organizations that are non-IT are also considered important stakeholders in digitally driven businesses. Therefore, it is interesting to see what factors affect the success of knowledge transfer to enhance the application of digital tools for non-IT employees, which will be useful for setting strategies and developing concrete knowledge transfer of digital tools in the organization.

## **2. Objective**

To develop a conceptual framework about factors affecting the success of knowledge transfer to enhance the competency of applying digital tools for non-IT employees in the context of petrochemical companies in Thailand.

## **3. Theoretical Framework**

### **3.1 Related Theories and Concepts**

Knowledge transfer is the transmission of knowledge from one person to another with a need for knowledge. The transfer process can be viewed as the flow of messages, starting the process from the sender to the receiver (Distanont et al., 2012). The process that arises from acquiring knowledge and applying knowledge to benefit by improving it to achieve speed and efficiency in work as much as possible (Liyanage et al., 2009). Knowledge transfer has many important components. It begins when a knowledge transferor transmits knowledge to a person called a knowledge receiver (Kumar & Ganesh, 2009) with an appropriate transfer process (Chung-Jen Chen et al., 2014). The success of the process of knowledge transfer depends on technology characteristics which is another factor to consider (Nor Aziati and Juhana Salim, 2011).

A knowledge transferor is vital to the successful creation of digital knowledge. A knowledge transferor must be competent in creating and transmitting knowledge. A knowledge transferor must be knowledgeable

and reliable and has the disseminative capacity, willingness to share, and knowledge integration from each department (Nor Aziati et al., 2011). In addition, Liyanage et al. (2009) studied the factors affecting knowledge transfer, stating that a knowledge receiver has an important component which is absorptive capacity and willingness to learn. Also, the receiver must have the ability to apply knowledge in their own context (Knowledge & Adoption) (Argote and Ingram, 2000).

The transfer process helps to transfer knowledge between the knowledge transferor and knowledge receiver more efficiently (Khongmalai and Distanont, 2022). It consists of learning through various activities, including hands-on practice, training, discussions, consultations, seminars, study visits, interviews, and preparation of a variety of educational documents suitable for each group of receivers which the content must be clear practical, and suitable for the job (Zarinpoush et al., 2006 & Blake et al., 2021). Technology characteristic is another factor that affects the ease of application of learned knowledge and technology. Technology characteristic consists of technology complexity, which is the difficulty of application. Highly complex technologies have a greater impact on the difficulty of transfer than less complex technologies. The level of complexity of the technology can be measured by the complexity of the process or the scope of the system that is difficult to use (Tan, Raykun R., 1996). Another element is technology compatibility, i.e. technology that is appropriate to the activities being undertaken will result in greater awareness of that technology and affect knowledge transfer (Bjorvatnet et al. al., 2018).

### **3.2 Organization context**

Organizational context is one of the key factors that contribute to the success of digital and technology knowledge transfer (Bacon et al., 2020). According to the Digital Majority model, it was found that digital transformation deals with the policies or strategies for the operations of the organization and its leaders, which are important elements of the organization to transform into digital. The policy or strategy for the operation of the organization is the formulation of policies or strategies in the organization in a concrete manner, is communicated, and is an important business mission (Rossmann, 2018). The organization's leadership is an important factor in creating knowledge and competency in the organization. Leaders have many roles in promoting successful knowledge transfer, for example, providing a clear vision or policy and various support (Glaser et al., 2021). In terms of resources, the organization must have time support, human resources, and a budget to promote the use of digital in the workplace along with the availability of modern digital tools, software, and infrastructure (Ifenthaler et al., 2019). In addition, another important part of organizational support is motivation, which means giving praise or rewards (Recognition), as well as communication and knowledge sharing within the organization to become a lesson learned from successful projects (Ren et al., 2019).

### **3.2 Digital competency**

According to a study on digital competency, it was found that there are three factors that contribute to the emergence of digital competence, namely knowledge about digital technologies, digital skills, and attitude toward digital technologies (Hamalainen et al., 2021). In terms of knowledge about digital technology, it is knowing what digital technology is, how it works, and why it is used or useful. Digital skills are analytical abilities and how to solve problems with digital transformation, and building skills and knowledge, attitudes, and beliefs are important as they determine learning behavior (Hamalainen et al., 2021).

### 3.3 Business outcome

Knowledge transfer related to digital and technology resulting in the application and creation of development projects to improve various work processes until becoming beneficial in various aspects of the organization. The benefits to the organization are various, including reducing time, reducing costs, increasing quality or reducing errors, and solving problems at work. That is to say, the use and increase of work efficiency both within the organization and to customers (Sanjay Mathrani et al., 2013 & Jan et al., 2004). In addition, the knowledge transfers in digital tools until it becomes a digital capability that leads to digital transformation or the development of a more digital corporate culture in which employees undergo digital transformation in their daily work processes. In addition, organizations will use large volumes of data to analyze strategies and processes, use digital tools to build process automation and control systems, link daily work with digital platforms, and use digital technology to develop products and services (Rossmann, 2018).

The results of the literature review can summarize the factors that are expected to be important factors in the conceptual framework of factors affecting the success of knowledge transfer to enhance the competency of using digital tools for non-IT employees in the context of petrochemical companies in Thailand as shown in Table 1.

Table 1 Observed variables in each of the Latent variable and reference to previous empirical studies		
Latent variable in this study	Observed variable in each of the latent variables	Reference to Previous studies
1. Knowledge Transferor	1.1 Digital knowledge & Experience 1.2 Disseminative capacity 1.3 Willingness to share	Liyanage et al. (2009) & Nor Aziati et al. (2011) Liyanage et al. (2009) & Nor Aziati et al. (2011) Liyanage et al. (2009) & Nor Aziati et al. (2011)
2. Knowledge Receiver	2.1 Digital knowledge & Experience 2.2 Absorptive capacity 2.3 Willingness to learn	Liyanage et al. (2009) & Nor Aziati et al. (2011) Liyanage et al. (2009) & Nor Aziati et al. (2011) Liyanage et al. (2009) & Nor Aziati et al. (2011)
3. Technology Characteristic	3.1 Technology Complexity 3.2 Technology Compatibility	Tan, Raykun R. (1996) Bjorvatn et al. (2018)
4. Transfer Process	4.1 Learning Process 4.2 Content	Zarinpoush et al. (2006) & Blake et al. (2021) Zarinpoush et al. (2006)
5. Organization context	5.1 Policy & Leadership 5.2 Resource management 5.3 Communication & Knowledge sharing	Rossmann (2018) & Glaser et al. (2021) Ifenthaler et al. (2019) Ren et al. (2019) & Nicholson et al. (2005)
6. Digital competency	6.1 Knowledge & Skill enhancement 6.2 Digital Project Adoption	Hamalainen et al. (2021) & Yu Zhao et al. (2021) Hamalainen et al. (2021) & Yu Zhao et al. (2021)
7. Business outcomes	7.1 Work Efficiency enhancement 7.2 Digital Culture organization	Sanjay Mathrani et al. (2013) & Jan et al. (2004) Rossmann (2018)

## 4. Methodology

This study is a qualitative research conducted by starting from the review of theories and past research related to knowledge transfer in order to understand the process of knowledge transfer together with the matter of digital transformation to understand the organizational context related to the use of digital in the organization, as well as searching for factors that influence knowledge transfer and the components of each factor and used as information for the model development for the knowledge transfer in digital tools. After that, the developed conceptual process and model were used to conduct in-depth expert interviews to confirm the factors and components of each factor, as well as the relationship between the factors. This study requires a team of 5 experts, comprising 2 experts in digital management and building digital knowledge in the organization, 2 experts in the use of digital tools to increase work efficiency, and 1 expert in knowledge transfer.

## 5. Results of the Study

From the review of theories, concepts, and past research related to knowledge transfer and the digital transformation of the organization, as well as in-depth expert interviews, the knowledge transfer of the organization can be analyzed and determined the journey as shown in Figure 1 by applying theories and concepts of knowledge transfer together with the context of the organization applied to analyze the learning process. This begins with the adoption of digital policies and strategies in the organization's learning plan by the digital working group to define the organization's knowledge, provide resources, and provide processes and facilities, like infrastructure, to promote knowledge transfer effectively. In addition, the important thing for upgrading the competency of using digital tools for non-IT employees is to apply knowledge to improve work processes to create benefits for businesses in various areas with policies and support from the management, as well as continuously communicating the benefits of using digital tools and sharing knowledge within the organization to create a sustainable digital culture.

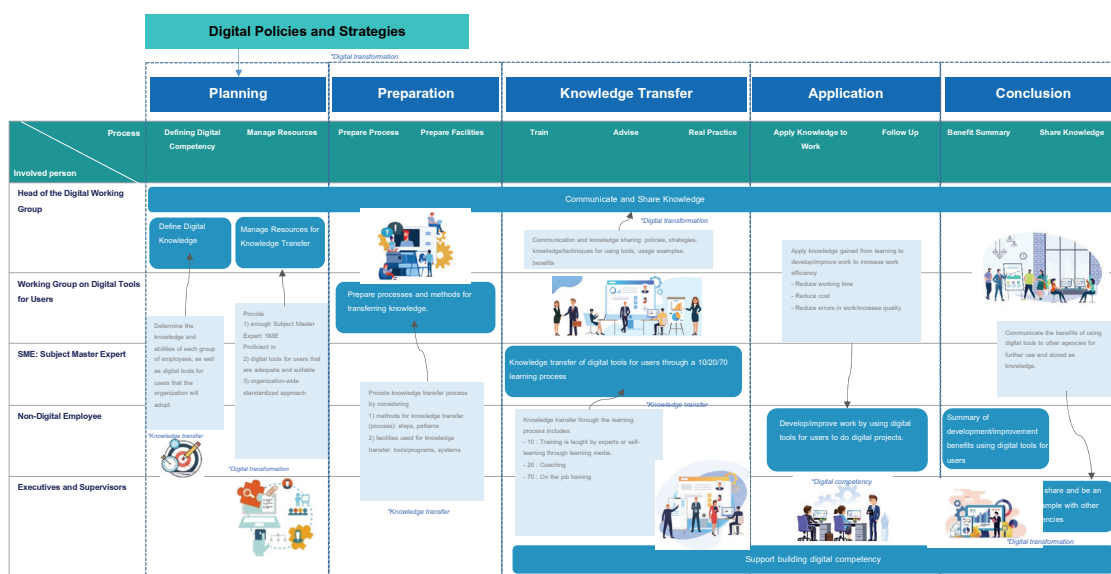


Figure 1 Knowledge Transfer Journey

According to the knowledge transfer journey of the organization, a conceptual framework for knowledge transfer of digital tools for users can be developed as shown in Figure 2. It relates to people, technology, process, and organizational context which affect the success of knowledge transfer to enhance the competency of applying digital tools for non-IT employees and lead to benefits to business outcomes.

Knowledge transferor is a factor related to the qualifications of the transferor, namely, digital knowledge and experience, as well as understanding the context of the receiver, having disseminative capacity, and willingness to share. On the other hand, the knowledge receiver is a factor related to the qualifications of the receiver, namely, digital knowledge and experience, as well as having absorptive capacity, knowledge, and understanding of work processes and problems in work to connect what is learned with actual practice and come up with ways to fix it, as well as willingness to learn to apply knowledge to solve problems and help work more efficiently. Technology characteristics are a supporting factor that involves the complexity of implementing digital tools for users and suitability to the work process can help solve problems, improve work efficiency, and be suitable for use in each work group. In addition, the factor that contributes to the success of knowledge transfer is the transfer process. It is a factor related to the learning process and the content used to transfer knowledge that is easy to understand and is suitable for each target audience. The foundation to support the success of knowledge transfer is the organizational context which is related to

policy and leadership, executives or supervisors who have support for building knowledge of digital tools in terms of budgeting for project management using digital tools, time support, and providing advice and consultation. The next element is resource management, both in terms of creating experts and support in providing sufficient facilities for users and communication and knowledge sharing which is a continuous communication in the organization and bring successful digital projects to show and share to see the benefits from implementation and generate ideas to expand in new areas.

The success in knowledge transfer is a result of the above factors, resulting in digital competency and enhancing the competency of applying digital tools which is knowledge and skill enhancement, as well as digital project adoption for improvement and business outcomes in terms of work 1) efficiency enhancement in various areas, including reducing work time, reducing costs, and reducing errors, and in terms of digital culture organization to be more sustainable.

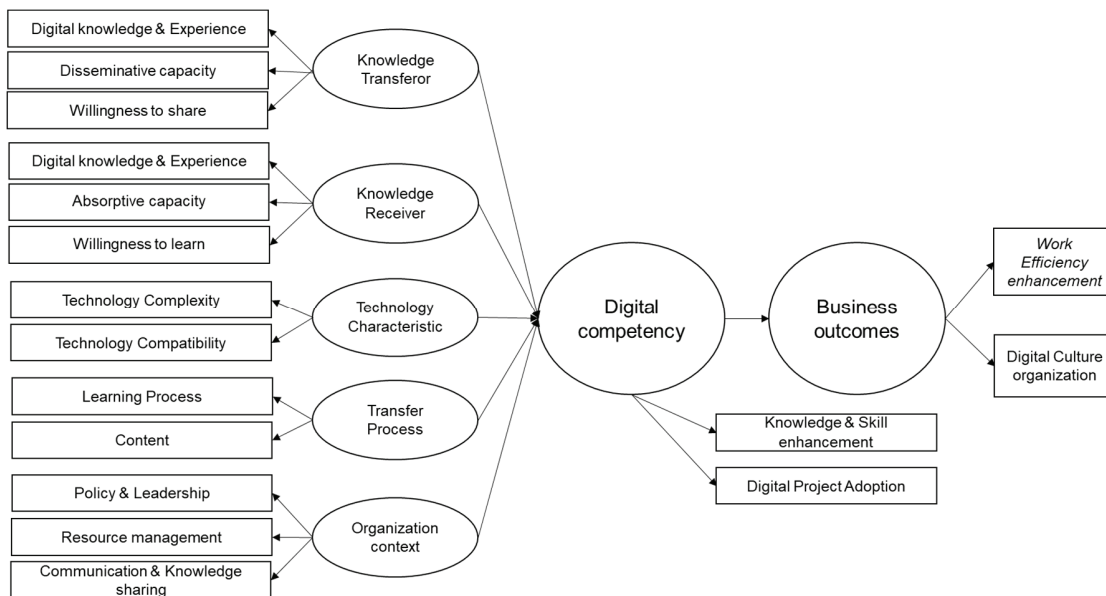


Figure 2 Conceptual Framework for Knowledge transfer successfulness of digital tools

## 6. Discussion

From the results of the data analysis, it can be concluded that the success of knowledge transfer to enhance the application of digital tools for non-IT employees is influenced by the knowledge transferor and knowledge receiver, who are factors related to knowledge, experience, ability to transmit and absorb knowledge, and the intentions of the receiver and the transferor, technology characteristics concerning the complexity and suitability of technology, as well as the process of transferring technology, both methods and content to be conveyed and the organizational context, which is the foundational factor that promotes the success of knowledge transfer. In particular, the promotion of digital transformation from all 5 factors together resulted in enhancing the digital competency of personnel in the organization. This leads to business outcomes in terms of increasing productivity and building a sustainable digital culture.

## 7. Recommendations

The developed conceptual framework of digital tool knowledge transfer can be used in an empirical study to analyze the influence of each factor leading to a guideline for strategy formulation and development of digital tool knowledge transfer in a case study of an organization to provide organizations with digital competency and make work processes more efficient to drive to the changes in the digital world. It can also be used as a basis for further study of other factors that may be relevant in the future.

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