

# The Relationship between Information and Communication Technologies Adoption and Management in Thai's Business Organization

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**Abstract.** ICT is used widely in every organization. There are many factors influent ICT adoption, such as industry type, competitive strategy, organization structure, management systems, and employee skills. In Thailand, every organization now focuses on ICT adoption. Questionnaires were used to collect data from 249 organizations in the Stock Exchange of Thailand (SET). This study found that only competitive strategy, management systems, and employee skills influent ICT adoption in Thailand. To make ICT adoption for providing benefits for any organization, management needs to align it with mission, vision, and strategy.

**Keywords:** ICT adoption, competitive strategy, organization structure, management systems, employee skills.

## 1. Introduction

Nowadays, Information and Communication Technology creates globalization, which affect business environment in every companies [13]. It changes numbers of customers and increases numbers of competitors and also numbers of substitutes. It provides a lot of choices for getting resources necessary for each company [8]. Every company can contact each other easily and closely with less time. Information can be passed to other companies via Internet. This creates business networks all over the world [17]. Today, most companies are in complex business environment. Changing in the one company affects other companies [16]. To making any changes, company must concern many things. Most companies are also in dynamic business environment, so it is important for responding to any changes quickly. Suitable processes and suitable structure play important roles in responding to environment changes.

Information is now using to support when making many decisions [20]. Information used can be in many formats depending on types of problems. Generating good information requires accurate, up-to-date, completed, and related data. Company's data are now kept by Information Systems and stored in database [10]. Companies in high competitive environment need good information.

Human resource is a major asset of every company [12]. It supports the company to fulfill the mission and vision. Along working in the company, employees kept much knowledge and history about the company, mainly from working processes. A part of expertise knowledge can be gathered for the company by recording in the operating reports [1]. This part of knowledge can be transferred to others in many ways. One of them is represented in form of structured programs, even in transaction processing systems, expert systems, and etc. [19] moreover, doing data mining and data warehousing captures some of unidentified knowledge, which can be represented by decision support systems or business intelligence [10].

Thailand also faces the changes of business environment mentioned above. However, in the past Thai's businesses did not concern about human knowledge or using information to support making any decisions. Thai's businesses have tried to collect the companies' knowledge and data seriously only a few years [22]. They have to change their working environment to be learning environment. This depends on the nature of people in the companies and their norms and cultures [20]. It is interesting to do empirical research about the relationship among Information and Communication Technologies adoption, business strategy, organizational structure, management systems, and human knowledge in Thailand. The result can be used by the managers to adopt ICT effectively and beneficially for the companies.

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## 2. Theoretical Background

### 2.1. Conceptual Framework

According to framework developed by [22], there are relationships among technology, strategy, structures, management systems, and people to form any company as shown in Figure 1. The way that these factors form provides the company some competitive advantages to survive and win in the dynamic and complex business environment based on the company's mission and vision.

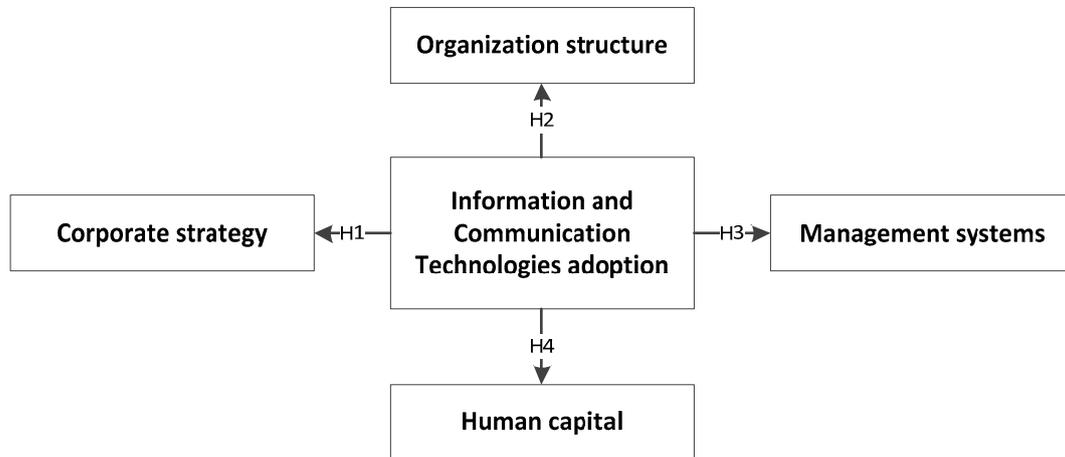


Fig. 1: Conceptual Framework

### 2.2. Information and Communication Technology Adoption

There are many types of technologies used as resources to produce services and products of the company [17]. Today computer networks and databases can be considered as one of company's infrastructures because every information systems need them to transfer and collect data. Difference Information Systems support different business [4]. It can support effective communication within and outside company via e-mail, internet, extranet, or intranet. For basic functions of the company, transaction processing systems are developed to support each business process. Transaction processing systems are sometimes called Process Support and Improvement (PSI). To cover all business processes, transaction processing systems have to link together using the same standard data format and platform. For this purpose, these transaction processing systems are called Enterprise Resource Planning (ERP). After collecting company's data via Information Systems, the reports and information can be generated by retrieving the related data from the company's databases. Sometimes companies can find the knowledge from data in databases by developing data warehouses and doing data mining. The technologies that support this purpose are called Data Access and Analysis (DAA). The last type of Information and Communication Technology in the business is Management Decision Support (MDS) systems. This kind of technology mainly helps managers making decision efficiently.

### 2.3. ICT adoption and Competitive Strategy

From the theory, there are two main business strategies that provide competitive advantage to the company: differentiation and low cost [1], [23] mentioned that technologies affect strategy. Differentiation strategies require different ICT. [7] stated that ICT is a source of sustainable advantage [8]. Different types of ICT provide different competitive advantage to the company [12]. Different business strategy requires different kinds of data and information [16]. ICT adoption can provide opportunity to the company for changing business strategy quickly. It is used for the company to response to the business environment change [5]. This leads to the following research question:

H1: There is a relationship between Information and Communication Technologies adoption and competitive strategy.

### 2.4. ICT adoption and Organizational Structure

To response to the business environment, organic organization is the ideal organization structure. In organic organization, there is no fixed structure. Everyone in the organization understands the mission and

vision of the company very well. They also have high specific skill. Also they can adopt their knowledge to finish any jobs. No formal line of command is required. The objective of working is to finish the mission and response to the business changes as fast and good as possible. It also does not have fixed jobs description, rules and regulations, and budgeting [1]. To facilitate this kind of organization, ICT supports communication among colleagues. It also allows everyone in the organization to access information directly and effectively [13]. However, ICT cannot replace the expertise of each employee [16]. For these reasons, ICT may or may not affect the organization structure. In this study, relationship among ICT and organization structure would focus on formalization and centralization of the company [19]. This leads to the following research hypothesis:

H2: There is a relationship between organization structure and ICT adoption.

## **2.5. ICT adoption and Management System**

Information and Communication Technology lines all over the company. It helps company increase coordination and control efficiently [9]. Communication among employees and management can be supported by ICT [19]. Everyone in the company can involve in company planning process and also manage the finance and human resource effectively and efficiency [14]. Bringing ICT to use in the company might influent the management style, which focuses on strategic planning systems, financial control systems, personnel control and evaluation systems, or personnel recruitment systems [7]. Thus leads to the following hypothesis:

H3: There is a relationship between Information and Communication Technologies adoption and management systems.

## **2.6. ICT adoption and Human Skills**

Human is one of major resources which drive the company to move forward effectively and efficiency [22]. During working, people collect knowledge from trials and errors. The longer time working in a specific task is the more experience or knowledge that employee gets. ICT helps the company and workers to collect and represent the knowledge from working. Moreover, data in the operational database collected from every transaction processing systems can be processed to find knowledge directly. However, workers need to have many skills for interpreting and turning data into knowledge [9]. These skills are analytical abilities and knowledge, organizing ability, leadership, and teamwork and horizontal communication [6]. This leads to the following research hypothesis:

H4: There is a relationship between employee skills and ICT adoption.

## **2.7. ICT adoption in different industry type**

Different industry types may have the some basic ERP systems. However, there must be some proprietary processes and knowledge differences among different industry. Even, company within the same industry still have different internal process especially technologies that provide process support and improvement (PSI), data access and analysis (DAA), and management decision support (MDS) [4]. It is important to study the relationship between industrial type and ICT adoption.

H5: There is a relationship between industry type and ICT adoption

## **3. Methodology**

The study based on a survey that a questionnaire was developed to collect data from Thailand's companies. The research instrument contained questions in connection to ICT adoption and organizational management. The questions are in the both characteristics of Information and Communication Technology adoption part and organizational management part are adapted from [23], and using 5-likert scales. To ensure data quality and to enhance response, a pilot test was conducted. The responses were used to improve the instrument to ensure content validity and reliability.

The questionnaires were sent to 484 companies. Each company is listed in the Stock Exchange of Thailand (SET). There are 249 filled questionnaires were received. The response rate is 51.45 percentages, which is acceptable [3]. The data was coded and analyzed using SPSS for Windows version 16.0.

## 4. Result and Discussions

The characteristics of samples are closed to that of the population. The data indicate that most companies have highly ICT adoption. Moreover, it showed that ICT adoption in organizational management has average level at 4.06, which means companies adopt ICT to support some of their business processes or a part of each business processes.

Considering the result of linear regression models, industry type relates with ICT adoption with statistical significant level at 95 percentages, and R square equals to 0.038. This means that there are some other factors that influent ICT adoption along with industry type [2]. The finding supports that company in different industries have different characteristics of ICT adoption.

The results of multiple linear regression models where ICT adoption is the dependent variable suggest that Competitive strategy, organization structure, management systems, and employee skills have relationship with ICT adoption at statistical significant level at 95 percentages, and adjusted R square equals to 0.293, 0.078, 0.064, and 0.233 respectively. Table 1 shows the regression models and related hypothesis supports. The findings suggest that, besides industry type, all factors studies in this research influent ICT adoption. Considering all of these factors together, the multiple linear regression models showed adjusted R square equals to 0.034 and statistical significant level at 95 percentages. In this model, all of dependent variables have relationship with ICT adoption. The findings support all research hypotheses mentioned in this study. To adopt ICT in any company, management needs to understand their mission and finds out the business industry, where his/her company is in. As [2] mentioned that different industry might have different process, management style, and knowledge. ICT used in any company should support proprietary characteristic of that company. In Thailand, ICT is used for a period of time, however, most company just start concerning about using ICT that aligns to competitive strategy, organization structure, management systems, and employee skills [2]. Moreover, organization culture might have impact on ICT adoption [20].

Independent variable	B	Adjusted R square	Hypothesis
Competitive strategy	2.042	0.293	H1 supported
Organization structure	2.982	0.078	H2 supported
Management systems	3.224	0.064	H3 supported
Employee skills	2.533	0.233	H4 supported
Industry type	7.864	0.034	H5 supported

## 5. Implications and Conclusions

The result supports all research hypotheses. The research framework proposed in this study is acceptable. There are relationship among industry type, management systems, competitive strategy, organization structure, and employee skills. As [2] mentioned companies in Thailand just started concerning about ICT which can support doing business based on mission, vision, strategy and knowledge, it is important to study the relationship stated in this study again to find whether there is any changes and also to find other factors that might have influence on ICT adoption.

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