

# Adoption of E-Business by Thai SMEs

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**Abstract**—The use of e-business in small and medium-sized enterprises (SMEs) has been recently received an enormous attention in information systems research by both academic and practitioners. With the adoption of new and efficient technologies to enhance businesses, Thai SMEs should be able to compete worldwide. Unfortunately, most of the owners are not used to new technologies. It is clear that most Thai SMEs prefer to work manually rather than electronically. This paper aims to provide a fundamental conceptual framework for E-business adoption by Thai SMEs. Rooted in Knowledge transfer model, several factors are identified, which drive and enable e-business adoption. By overlooking the benefits associated with implementing new technologies, it is difficult for Thai SMEs to perform well enough to compete globally. The paper also helps Thai SMEs to understand factors related to E-business adoption.

**Keywords**—E-business, SME, Adoption, Knowledge Transfer, Thailand.

## I. INTRODUCTION

THE e-business has frequently been mentioned in the popular press and discussed in many popular articles and books, e.g., [1], [2]. With the expansion of new technologies, the internet has become an innovative way of running a business as well as improving business processes and making it more cost effective [2]. Despite the interest, there is still a growing acknowledgement that a theoretically rigorous focus is required in the e-business study. For example, little is known about the antecedents that drive the patterns of e-business adoption across organizations and about the differential implications of these patterns for business performance.

To address these knowledge gaps, we pursue these research questions in this study. How should e-business adoption be conceptualized and measured? We propose a multi-dimensional conceptualization of e-business adoption across business processes. This study aims to analyze Thai SMEs and apply the framework of knowledge transfer in order to adapt itself corresponding to the changing technology.

We define e-business as “the use of Internet technologies to link customers, suppliers, business partners, and employees using at least one of the following: (a) e-commerce websites that offer sale transaction, (b) customer-service websites, (c) intranets and enterprise information portals, (d) extranets

and supply chains, and (e) IP electronic data interchange” [3]. This definition is broadly consistent with that of [4]: “the use of electronic networks and associated technologies to enable, improve, enhance, transform or invent a business process or business system for create superior value for current and potential customers” (p.15). Both definitions recognize that, by helping to build and manage relationships with customers, suppliers, employees, and business partners, e-business can potentially transform a firm into a networked entity with seamless supply chains and value creation processes [5].

In general, many small and medium enterprises (SMEs) try to adopt new technology to support their business. Due to their limited resources, the pattern for SMEs new technology adoption is very different than larger organization [6], [7]. An incorrect decision can have a devastating effect for SMEs. Therefore, SMEs need to be very careful in their IT investment decision-making. It appears that the most frequently asked question by SMEs is how to adopt IT successfully. This paper proposes a systematic e-business adoption strategy for SMEs.

In the literature, SME have been characterized using different criteria such as maximum number of employees, the annual sales, and total assets [8], [9]. In this paper, we adopt the Thailand’s SME definition which is all business organization who process assets less than US\$1 Million (excluding land and building) and have annual sales turnover less than US\$5 Million [9].

Currently, there are many Thais who either do not know about how technology works or who do not have access to the Internet. This means e-business is still in the initial stage of growth in Thailand. A lack of knowledge can lead to technology phobia among proprietors. Many Thai SMEs still prefer to do businesses manually rather than electronically. There are concerns about the cost of implementing E-business along with a lack of realization about the benefits associated with the adopting E-business. SMEs are also concerned with many issues such as security and privacy caused by e-business implementation. In addition, there is a risk of losing data and a lack of privacy. The majority of Thai SMEs operate under poor business management which is evident by their lack of strategic direction and perspective. The above factors, in addition to internal and external issues, could translate to a high failure rate among new SMEs in Thailand.

The remainder of this paper is structured as follows. In Section 2, the theoretical background of this study is outlined. Drawing from a Knowledge-based literature, this paper develops a theoretical framework, consisting of different internal and external factors influencing e-business adoption. Afterwards, our propositions are also described. Finally, the summary is concluded in the last Section.

## II. LITERATURE REVIEW

A number of studies have been conducted on e-business and technology adoption. Unfortunately, most of these studies have been conducted in developed countries [5]. In fact, most of developing countries substantially fail to adopt Internet based economy. Many studies illustrate that both governments and consumers are not ready to embrace a new technology based economy [10]. As a result, many developing countries still face difficulties in identifying, accepting, and implementing the potential benefits of new technology and thus adopting e-business for domestic economic development [11].

### A. SMEs in Thailand

According to the Thailand Development Research Institute (TDRI), there were about 700,000 internet users in 2000. Even though the growth of internet users increased, the trade via internet or e-business in Thailand was still inaccessible [10]. Approximately 187 enterprises used a digital environment with the majority being in Computerized Industries (17 percent), Service Industries (16 percent), Tourism Industries (12 percent), the Control of Food Safety in Hospital Kitchens (7 percent), Entertainment Industrials (5 percent), and the remaining being in other industrial fields. In addition, the ECRC also set up legal infrastructure, security, and policies based upon the standard of e-business in order to develop enterprise infrastructure, reform bureaucracy, and complete competitive fairness [12].

Nowadays, small and medium businesses continuously contribute to the growth of the country GDP. SME can be accumulated up to 39 percent of Thai GDP in 2007 [13]. Corresponding to this statistics, Thai government started to realize the importance of medium business and small business and trying to promote small and medium enterprises in Thailand during 2007-2011. The promoting activities includes: (1) building and improving enterprises; (2) increasing productivity and the ability of inventing innovation of small and medium enterprises in terms of production; (3) increasing efficiency and decreasing the bad effects in terms of dealing businesses; (4) supporting good services for increasing value to the customer; (5) promoting small and medium enterprises in local areas and other districts; and (6) developing factors which facilitate business production.

### B. Barriers toward E-Business Adoption

There is a trend towards major classification of e-business barriers to SMEs. These trends are simultaneously described as followed: (1) supplier barriers, such as difficulties

obtaining finance and technological information and difficulties in choosing the appropriate hardware and software; (2) demand barriers, such as the e-business itself does not fit with the products, services, or the way the customers expect to conduct the business with the company; (3) environmental barriers, such as complicated governmental regulations and security concerns; (4) resource barriers, such as a lack of management enthusiasm and a lack of technological expertise; and (5) systems boundaries: e-business may not fit in well with their current business practice [14].

Reference [14] is not the only researcher who shared his concern and classified these barriers. Many other researchers also share their opinions in the own unique way. Lawrence (1997), for example, proposed his finding as: (1) company barriers; (2) personal barriers; and (3) industrial barriers.

Developing countries, including Thailand, normally face a greater number of challenges than the developed countries. Developing countries are frequently found many problems, such as the lack of telecommunication infrastructure, the lack of qualified staff to develop and support e-business sites, the lack of skills among consumers needed in order to use the internet, the lack of reliable systems for delivery physical goods, poor internet connectivity, and underdeveloped states of Internet service provider (ISP) [15].

There are a number of unique barriers in adopting e-business in Thailand. The main obstacle is severe financial difficulties, including a shortage of working capital and unsustainable debt burdens. Many SMEs, especially those making handcraft products, have deficient fixed assets and do not use standard accounting procedures. As a result, they have difficulty obtaining credit from domestic financial institutions. Furthermore, they also have limited access to other sources of capital because they simply can not afford the services of international investment banks [16]. Although the government realizes the importance of SMEs, its policies to support them are still vague.

### C. Perspectives of E-business Adoption

Much of the technological knowledge required by small and medium firms in the early stages of development in developing countries is incremental and can often be acquired through what is described as "elementary learning" [17]. As firms climb the ladder of manufacturing complexity, the types of knowledge they require, the nature of their organization, and the forms of institution to support them become increasingly complex.

A high knowledge transferring ability can facilitate e-business adoption in multiple ways. First, e-business adoption can not be characterized in terms of a well-defined, clearly structured event that follows an established procedural pattern – rather it represents an ongoing process of assimilation and transformation. Therefore, a willingness to adopt may not in itself lead to high levels of e-business implementation. Such willingness must be supported by an adequate knowledge transferring capacity that facilitate: (a) the quick recognition of new development in the e-business arena, (b) an

understanding of how e-business initiatives can augment existing operations, and (c) a continuous scanning of the environment for successful implementation stories that can be replicated [18]. In addition, higher organization knowledge transferring capability will motivate more intense adoption of e-business initiatives in communications processes both within the business and at its interface with its environment.

After knowledge is acquired, it needs to be transferred in order to develop and integrate itself to support a business requirement such as IT to be able to provide for future users [19]. The difficulty is that knowledge is perceived differently by individuals. There are needs to have someone who has a specific skill in each area to transfer the knowledge because it requires a higher intensity and quality of interaction which would take much more time. A manager can enhance information within the operation and help it to flow more readily within an organization. Knowledge also encompasses the ability to link engineering and managerial skills so that it can be used to plan, develop and implement technological advances. Beyond this point, there is an obstacle to transfer knowledge due to both internal and external factors.

Knowledge transfer is used to organize, create, capture and/or distribute and ensure its availability for future users. However, knowledge transfer is more than just a communication inside the firm. It is very complex to accurately and successfully transfer knowledge within a business. Unfortunately, for businesses in Thailand, this issue has been inadequate because they have been involved with such a legacy system of disciplinary fragmentation.

### III. CONCEPTUAL MODEL

Understanding the factors that impact the adoption of e-business by SMEs before adopting e-business is crucial. Knowledge transfer is one of the main factors that can help us to investigate many aspects of adopting e-commerce. Towards this goal, we describe and develop an overall theory for the effect of knowledge transfer. Our primary proposition is that knowledge transfer is a significant predictor of SME's willingness to adopt the e-business. Our research model is shown in Figure 1.

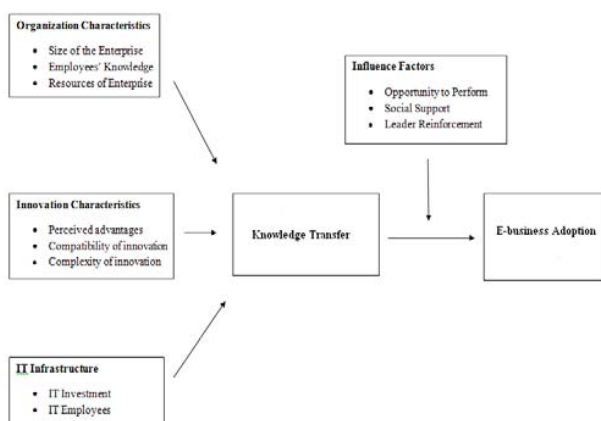


Fig. 1 The Conceptual Model of E-Business Adoption

### 1. Characteristics of an Organization

#### 1.1 Size of the Enterprise

The size of the enterprise is one of the main factors that determine the probability of whether or not a business will adopt new technology [20]. Small enterprises typically have less complex organization structures and are less likely to adopt new technologies because they lack resources, such as professional expertise. Furthermore, they also have a greater sensitivity to external factors. Large enterprises have resources and an infrastructure that make it easier for them to adopt new technological innovations. They have several advantages over small enterprises such as being able to take more risks associated with investment and more power to support adopting technology with network externalities.

#### 1.2 Employee's Knowledge

During e-business adoption, new technologies require many changes in employee working attitudes in order to use information and recognize the needs, opportunities, exposure and experience [21]. Employees are motivated intrinsically which is significant when tacit knowledge between terms must be transferred to form a better understanding. This understanding can help an organization to gain an advantage over the competitors by capturing a larger demographic of existing and potential customers in e-business reaching individual interest and preference. Moreover, employees' learning capacity is also essential in terms of self efficacy to understand business by IT and understand IT by business.

#### 1.3 Enterprise Resources

Finance, humans, and technology play an important role in business adoption. If firms do not have the necessary resources, they will face major obstacles when trying to integrate new technologies and e-business. Businesses in developing countries have many constraints, such as limited experience, finances, technology, and human resources. These businesses lag behind their counterparts in developed countries in using e-business. Small businesses in developing countries have both cash flow problems and inadequate resources to pay for sophisticated management and financial instruments. Therefore, based on the reasons stated above, we propose:

*Proposition 1:* Characteristics of organization is related to SME knowledge transfer.

### 2. Characteristics of Innovation

#### 2.1 Perceived Advantages

These are the degree to which potential adopters perceive in innovation is related to the advantages perceived relative to existing conditions [22]. It is stated in terms of profitability and cost reduction. Positive perception exists between advantages and the relative adoption behaviors which provide an incentive to adopt e-commerce. The use of e-commerce in

enterprises is often gained from rapid access to information, the creation of a worldwide client database, distribution of information and the extension of the market and improvement of customer service.

## 2.2 Compatibility of Innovation

Compatibility is the degree to which innovation is perceived to be kept with the previous performance and the needs of possible adoption [23] with the present working environment, working processes, values, and beliefs of the SMEs. The form of e-business that enterprises use should enable them to reduce risks and make minimal adjustments and changes to shrink resistance to adoption. In contrast, the incompatibility of an e-business system with existing work procedures affects the users' attitudes and increases their resistance to change which leads to obstacles when adopting e-business.

## 2.3 Complexity of Innovation

Complexity refers to the degree in which innovation is perceived as being difficult to use. It creates greater uncertainty for implementation to be successful and enhance the risks in the adoption decision. Therefore, a higher degree of complexity of e-business would negatively influence the decision to adapt. The technical know-how required for e-business could prevent its adoption [24]. Therefore, based on the reasons stated above, we propose:

*Proposition 2:* Characteristics of Innovation is related to SME knowledge transfer.

## 3. Information Technology Infrastructure

### 3.1 IT Investment

Several studies have focused on the relationship between IT investments and a firm's performance. In large organizations, this relationship affects profitability, productivity and consumer surplus [23], however, it might not be too significant in terms of overall profit. Measured IT payoffs are gauged through perceptual measures. Executives usually rely on their perceptions to determine whether a particular IT investment creates value for the firm.

### 3.2 IT Employees

IT knowledge can be one of the important predictors in the adoption of e-business by SMEs [25]. Reference [26] found that a CEO's IT knowledge is one of the most important factors influencing the successful adoption of e-business by SMEs in South Korea. Reference [27] argues that the knowledge factor is related to a manager's innovativeness and willingness to adopt. Reference [28] found top management support to be a significant factor influencing the adoption of e-commerce. If high level management is willing to adapt and implement e-commerce then the firm is more likely to embrace it too. Therefore, based on the reasons stated above, we propose:

*Proposition 3:* IT infrastructure is related to SME knowledge transfer.

## 4. Knowledge Transfer

Knowledge transfer process in SMEs is critical because their business processes will be conducted more efficiently when they have good procedures to transfer knowledge to all of their staffs. It takes both electronic and technological mechanisms to transfer information from one person to another person. This can be happen through writing, training, conferencing inside the organization and communicating. Furthermore, an organization can exchange tasks between people with a mentor system to transfer information. A relaxed approach to exchanging tasks includes letting everyone share his or her work ideas and experiences. This leads to a more productive transfer and exchange of knowledge.

As knowledge plays an important role in an organization, it would also benefit a firm to include context-specific characteristics. The capacity for knowledge creation [29] is the process of developing and generating innovation from the skills and relationships among people within an organization by changing experiences and building new knowledge in many forms such as research and development, learning by training, well-planned problem solving, learning from past experiences, and brainstorming and exchanging opinions among people on the team.

Knowledge transfer in a certain unit can be measured by its changed performance to capture tacit knowledge better than approaches that attempt to measure the knowledge more directly. Sharing more information creates more selling opportunities. In addition, it allows the firm and the customer to have a better understanding regarding products and services. Therefore, the enterprise can efficiently deliver more value to its customers. E-business can have influence other areas of the company such as improving product quality and overall customer satisfaction. Therefore, we propose:

*Proposition 4:* The knowledge transfer is related to e-business adoption by Thai SMEs.

## 5. Influencing Factors

### 5.1 Leader Reinforcement

Prior research (e.g., [27]) indicated that manager characteristics are one of the main factors affecting the adoption of e-commerce due to their extended power in decision making. The leader which possesses knowledge of information technologies has an effect on the adoption of e-commerce and their knowledge also provides a positive influence on the degree of use of e-commerce.

### 5.2 Competition Intensity

Intensity of competition can be measured by the number of competitors and policies of e-commerce adoption in the enterprises. The competition influence of e-commerce

adoption in small enterprises has been found by [7], while Reference [24] found that the competition pressure influences adoption. It has been suggested that firms with powerful competition have higher rates of adoption of technological innovations [23].

### 5.3 Government Support

Government financial support is either direct or indirect through technological resources, knowledge deployment and subsidies. Researchers argue that the government has been a source of funding infrastructure and the technological innovations even though it might differ from country to country [30]. A government can also provide incentives in the form of economic, financial and technological support to help lower the barriers of IT adoption. Therefore, based on the reasons stated above, we propose:

*Proposition 5:* The knowledge transfer is related to the degree of e-business usage in Thai SMEs.

### 6. E-Business Adoption

E-business could bring a possibility to trade a large number of products as a two-way communication requires the development of a new style of conversation between an organization and its customers. As organizations tend to be more responsive and cautious about the actions of competitors in an environment, they are willing to follow their competitors in adopting new technologies. It has been suggested that firms with powerful competition have higher rates of adoption of technological innovations [24] from higher competitive pressure which will be more likely to adopt e-commerce by the firms. Reference [25] examined 184 SMEs in Brunei and found that the influence factor is the most important factor in terms of the relative importance in influencing the adoption of e-commerce by SMEs. Therefore, the openness of an organization and competitive pressure are more important to receive innovations to be successful in their adoption of innovations [23].

## IV. CONCLUSION

E-business plays an important role in business activities of all firms. It can assist a customer to procure low cost products and services, incurring search costs, facilitating transactions between geographically separate parties, reducing paper work, and decreasing the duration all the transactions. The goal of the study is to identify whether or not knowledge transfer is one of the reasons why Thai SMEs implement e-business. In this study, we provided a clear understanding of the factors influencing e-business adoption by SMEs. According to our proposed model the knowledge transfer process of the company can occur only after they have factors, such as organization characteristics, innovation characteristics, and IT infrastructure, which are the three major factors of knowledge transfer inside the companies. Knowledge transfer cannot take place if one or more of these three factors are missing.

In addition, we also introduced a research model postulating that mediated by influencing factors, such as opportunity to perform; social support; and leader reinforcement; knowledge transfer will be an important predictor of intention of Thai SMEs to adopt an e-business. The propositions of this study are useful not only for managers of SMEs but also for government bodies that have economic reasons to be concerned about the development of SMEs.

However, it is still not clear if the problems of e-business adoption can be solved, especially by Thai SMEs that do not have budget and resources to conduct e-business. In our study, we explored factors that influence the adoption of e-business by SMEs. Our study could possibly contribute to the body of knowledge of e-business adoption in developing countries. It can be a first building block for a more sophisticated model, which needs to be elaborated in further studies. A more formal model can release the identified factors and propose hypotheses that can then be tested on a large scale. We plan to conduct a more rigorous study to generate more insight into the proposed factors, and to generate theory that will help both practitioners and researchers as a general framework for the e-business adoption in SMEs.

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