

# INFORMATION SYSTEM ADOPTION WITHIN VIETNAMESE SMALL AND MEDIUM ENTERPRISES

LAHTI UNIVERSITY OF APPLIED SCIENCES  
Degree Programme in Business Information Technology  
Bachelor's Thesis  
Spring 2011  
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Degree Programme in Business Information Technology

TRAN, TRUONG SINH: Information system adoption within  
HOANG, CHI TRUNG: Vietnamese small and medium  
enterprises

Thesis in fulfillment of Bachelor of Business Information Technology, 84 pages,  
05 pages of appendices

Spring 2011

## ABSTRACT

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**Background.** Small and medium enterprises play an important role in economies, including Vietnam's. The need for information systems is now necessary in every enterprise. Most of published studies on information systems have been conducted in developed countries, with little in developing or less developed countries. From those few, there was no one focusing in Vietnam.

**Aims.** This thesis examines the experiences of seven Vietnamese small and medium enterprises when they adopted information systems. The authors investigated the reasons for, the process of, and the factors influencing information system adoption.

**Methods.** The qualitative research method was used to answer research questions. Semi-structured interviews were used as the data collection tool to explore participants' experiences. Content analysis of the interview transcripts was used to extract answers given during the semi-structured interviews and to identify new themes that emerged from the data. The participants' experiences were compared to what has been reported in the existing literature.

**Results.** The analysis resulted in important findings. It confirmed some reasons and factors found in the literature concerning information system adoption in Vietnamese small and medium enterprises. Despite some similarities, the authors found some differences, such as government role, concerning the information system adoption.

**Conclusions.** The results confirmed some factors and reasons, but also brought up some new ones. We suggest, therefore, some further studies on those.

**Keywords:** information system, adoption, information system adoption, small and medium enterprise, sme, vietnamese

This thesis is available as printed and electronic books (ISBN: 9783843372961)  
by Lambert Academic Publishing, distributed through Amazon and other  
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TruongSinh Tran  
Chi-Trung Hoang

# Information System Adoption

Within Vietnamese Small And Medium Enterprises

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*This thesis is dedicated to my beloved grandparents, **Trần Văn Hạnh, Hà Thị Hòa, Nguyễn Tường Diễn, and Nguyễn Thị Ngát**, who devoted their whole lives to their poor children; and most of all, my absolute adored parents, **Trần Minh Thư** and **Nguyễn Thị Tường Vân**, for their endless love, support and encouragement.*

*TruongSinh Tran*

*To my beloved family, **Bùi Thị Xem, Hoàng Hoa Chí, Bùi Ánh Tuyết** and **Hoàng Chí Hiếu**.*

*Chi-Trung Hoang*

## ACKNOWLEDGEMENTS

*The completion of the following thesis would not have been possible without the expert scholarly direction of our supervisor, **Professor Torsti Rantapuska**, whose guidance and support proved indispensable. In addition, we would like to express our sincere thanks to **Professor Keith O’Hiobhaird**, **Professor Aria Kanerva** and **Professor Antti Salopuro**. The guidance and constructive feedback from these individuals helped to enhance the linguistic and academic quality of our thesis. Finally yet importantly, we would like to thank our friends for their supportive advice and encouragement, and participants who provided us helpful information in the interviews.*

*TruongSinh Tran & Chi-Trung Hoang*

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## LIST OF ABBREVIATIONS AND SYMBOLS

€	The euro (currency code: EUR) official currency of the Euro zone
\$	The United States dollar (currency code: USD) official currency of the United States of America
₫	The đồng (currency code: VND) official currency of the Socialist Republic of Vietnam
B2B	Business-to-business
Bil	Billion (1,000,000,000)
CE	Computer engineering
CEO	Chief Executives Officer
CFO	Chief Financial Officer
COTS	Commercial-off-the-shelf
CRIS	Credit Rating Information System, a self-developed system of Credit Rating Agency W
CS	Computer science
EC	European Commission
ERP	Enterprise resource planning
EU	European Union
GDP	Gross domestic product
GIS	Geographical information system
ICT	Inventory control system
ICT	Information and communication technology

IS	Information system
IT	Information technology
Mil	Million (1,000,000)
MIS	Management information system
R&D	Research & development
SE	Software engineering
SME(s)	Small and medium enterprise(s)
VAS	Vietnamese accounting system

# 1 INTRODUCTION

SMEs account for a significant share in economies, especially emerging ones. They have special characteristics that determine business workflow in general, and the IS adoption process in particular. (Clapham, 1985, pp. 12-14; Lewis & Cockrill, 2002, p. 196; Drew, 2003, p. 79; Levy & Powell, 2004, pp. 19-22; O'Regan & Ghobadian, 2004, p. 406)

In Vietnam, SMEs gradually increase their contribution to the national economy (Sakai & Takada, 2000, p. 2; Harvie, 2004, p. 1). So far, SMEs have accounted for more than 97 percent of Vietnamese business, using over one-third of total investments, employing over a half of laborers, and producing two-fifths of consumer goods and exports. They play an important role in the national socio-economic development, contributing around 47 percent of GDP and 40 percent of the state budget. (Le, 2011)

ICT per se is no longer a strategic resource of an organization, but the active and effective usage of it is. The need of an IS in particular, and ICT in general, is now no longer a plus, but a must, and accounts for a large portion of the investment portfolio in every enterprise (Willcocks & Lester, 1996, p. 282; Carr, 2003, pp. 41-49). Before an information system, just like any ideas, can be put into use, it is vital that the adoption process is conducted appropriately; otherwise, there might be protest, or even resistance against the new one (Keen, 1981, pp. 24-31; Kim & Mauborgne, 2005, pp. 119, 137; Garrett, 2006, pp. 202-224). At the time of writing, there are only few papers on IS adoption in SMEs, yet none has focused on those in Vietnamese SMEs so far.

We presented the background of the thesis, which emphasized the importance of SMEs in economies, as well as the importance of ISs in supporting business. To our knowledge, there has been no study specifically dealing with IS adoption in Vietnamese SMEs. That is the motivation for this study. This thesis aims to provide the readers a thorough understanding of how the adoption process of information system happens in Vietnamese SMEs, what reasons paving the way

for the decision to adopt the information system, and which factors surrounding the adoption.

As this thesis provides an insight into the IS adoption process and its influencing factors, it can be used as a source of reference for information executives (Chief Information Officers, Information Technology Directors), internal and external information system consultants, and others, especially students and researchers, who are interested in information system adoption generally and in Vietnamese SMEs particularly.

In Chapter 1, we present the background, goal, scope, target readers, as well as the disposition of the thesis. Chapter 2, which concerns with the research design, includes research questions, research purposes, research method, research strategy, research approach, actual data collection and analysis, validity and reliability. In Chapter 3, we review the literature about information system adoption, what factors being used to evaluate the success or the failure of the adoption, and what factors influencing the adoption. In chapter 4, we provide the definition and characteristics of SMEs, reasons for IS adoption in SMEs, and the status quo of Vietnamese SMEs. An overview of each case company is given in Chapter 5. Then, in Chapter 6, we go into detail of the adoption process of information system in every case company. We structure the analysis according to three main questions of this study. The analysis part starts with the IS adoption process in each company, continues with the reasons for adoption, and ends with the factors surrounding the adoption process. Finally, in Chapter 7, we present the conclusion of the thesis, which includes a thesis overview, results from analysis, suggestions to top managers, limitations of the thesis, and further works.

In general, SMEs have been playing an important role in economies, including Vietnam's. An IS, which now becomes necessary in every SME, should be adopted in a proper process to avoid any protest and/or resistance. There are some studies on IS adoption in SMEs, yet none focuses on those in Vietnamese SMEs. Hence, this paper, which is recommended for information executives, IS consultants, and researchers, tries to give an insight into IS adoption and its

influencing factors. The disposition of this thesis is built in a logical structure so that it can be skimmed as easily and fast as possible.

## 2 RESEARCH DESIGN

*There are no right or wrong methods. There are only methods that are appropriate to your research topic and the model with which you are working.*

*(Silverman, 2005, p. 112)*

### 2.1 Research questions

Yin (2003, p. 7) emphasizes that defining research questions is one of the most vital steps of a research study. The use of research questions is a more specific way to state the research problem from the start, and is suitable when researchers have a clear set of issues (Silverman, 2005, pp. 86-87; Horn, 2009, p. 55; Saunders, Lewis, & Thornhill, 2009, p. 32). The three main research questions in this thesis are:

RQ1: Why do Vietnamese SMEs adopt information system?

RQ2: How are ISs adopted in Vietnamese SMEs?

RQ3: What are factors that influence IS adoption process in Vietnamese SMEs?

### 2.2 Research purpose

There are mainly three categories of research purpose, namely exploratory, descriptive and explanatory. An exploratory research employs an open and flexible approach in order to find out “what is happening; to seek new insights; to ask questions and to access phenomena in a new light” (Robson, 2002, p. 59). Descriptive research aims to describe the phenomena accurately, through narrative-type descriptions, classification, or measuring relationships. In other words, it tries to “portray an accurate profile of persons, events or situations” (Robson, 2002, p. 59). Explanatory research aims to provide causal explanations of the phenomena. It emphasize on studying a situation or a problem in order to explain the relationship between variables. The purpose of a research can be mixed among those categories, depending on research questions and research

objectives. (Douris, 2002; Blanche, Durrheim, & Painter, 2006, p. 44; Saunders, Lewis, & Thornhill, 2009, pp. 139-40)

The research purposes of this thesis are explanatory, descriptive and exploratory. The combination of the three allows the author not only to describe a phenomenon but also to explain why it happens, and to explore factors that influence and interact with it (Douris, 2002). This thesis examines the experience of seven Vietnamese SMEs in adopting information systems. It focuses on not only describing the IS adoption process, but also explaining why Vietnamese SMEs adopt ISs, and exploring factors influencing them and interaction among these factors.

### 2.3 Research method

The aim of this study is to learn and understand the phenomena of IS adoption within Vietnamese SMEs. Such a complicated process demands a method that is suitable for thoroughly understanding the whole process, not only the factors influencing that. Therefore, this study employs the qualitative method, which enables us to study individual/organizational behaviors, the phenomena within their environments and reveal rich and complex processes.

The qualitative research method often uses in-depth involvement with the phenomena studied using tools such as case study, personal experience, introspection, life story, interview, artifacts, cultural texts and productions, observational, historical, interactional, and visual texts, which describe routine and problematic moments and meanings in individuals' lives. Qualitative researchers try to explore and understand the complexity of phenomena studied by immersing themselves into the subject matter. (Silverman, 2001, pp. 25-26; Denzin & Lincoln, 2005, p. 3; Silverman, 2005, pp. 6-8; Horn, 2009, pp. 6-7)

Information system adoption within SMEs is a complex socio-technical phenomenon (McMaster, 2001, pp. 1-2). SMEs consist of individuals and other resources that interact with each other in their daily operations. By introducing an innovation (a new IS), the interaction both within an SME and between the SME

and its environment changes. Such complexity needs to be explored in its fullness. Crotty (1998) and Leedy & Ormrod (2005) stated that any effort to reduce such complexity into mere numbers and figures could obscure the real picture (Sarosa, 2007, pp. 6-7). A quantitative approach using tools such as surveys was considered, but not adopted since the use of a survey tends to prejudge the outcome beforehand. Instead of making an educated guess at the outcome, the qualitative approach used in this study explores the phenomena. The outcome should provide a more complete picture drawn from the data collected by semi-structured interviews.

## 2.4 Research strategy

There is a variety of research strategies, such as surveys, histories, archival analyses (or archival researches), experiments, action researches, grounded theory, ethnography, case studies, etc. The optimal research strategy is determined by research question(s) and objective(s), the extent of the existing knowledge over the subject, the amount of time and other available resources, the authors' own philosophical underpinnings, and the degree of focus on contemporary as opposed to historical events. (Yin, 2003, pp. 3-5; Saunders, Lewis, & Thornhill, 2009, p. 141)

Case study is adopted as main strategy in this thesis, following the suggestion of Slappendel (1996) that research in adoption of innovation as interactive process using case research and case histories (Sarosa, 2007, p. 23). Robson (2002, p. 178) defines case study as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence". Morris and Wood (1991) highlight that the case study strategy is particularly helpful to gain a rich understanding of the context of research and the processes being enacted (Saunders, Lewis, & Thornhill, 2009, p. 146). The case study strategy also enables researchers to examine multiple perspectives of events, phenomena or behaviors, and has considerable ability to generate answers to the question *why*, *what* and *how* (Saunders, Lewis, & Thornhill, 2009, p. 146; Horn, 2009, p. 205).

## 2.5 Research approach

Relevant literature on IS adoption process in SMEs was studied firstly to construct a framework for the adoption process of information system, including reasons for the adoption and factors surrounding the adoption process. The knowledge compiled from research literature helped us to develop an initial model of IS adoption process which comprised factors influencing the process. Then, we designed the questions for the interview bases on that model. After that, we used coding method to categorize information extracted from the interviews. Finally, we analyzed the information according to our three main research questions to deduce the conclusion.

## 2.6 Data collection methods

An interview can be categorized as structured, semi-structure or unstructured interview. In semi-structured interviews, the researchers have a list of themes and questions to be covered, although these may vary from interview to interview. In other words, semi-structured interviews provides guidance, so that the interviews stay well within the focus of the study, yet provide room to explore new and relevant issues that emerge during the interview process. (Yin, 2003, p. 90; Silverman, 2005, pp. 117, 154-155; Horn, 2009, pp. 126-127; Saunders, Lewis, & Thornhill, 2009, pp. 318-320)

In this thesis, we used semi-structured interviews with open-ended questions to explore participants' experiences about the process of IS adoption in their companies. The use of interviews can help researchers to gain valid and reliable data that are relevant to the research questions and objectives. These interviews enabled us to find out not only the process per se, but also its influencing factors.

The model in literature review, which portrayed the typical process of IS adoption within SMEs, was the foundation to develop the semi-structured interview. A set of guide questions had been developed to inquire about the participants' experiences in adopting IS for their organizations. The questions directed to specific stages of IS adoption as portrayed by the model. The questions were open

ended to encourage participants to define and describe a situation or event extensively and developmentally, as well as reveal their attitudes (Silverman, 2001, pp. 17-18; Yin, 2003, p. 90; Horn, 2009, pp. 126-127; Saunders, Lewis, & Thornhill, 2009, p. 337).

Within the participants' organizations, the interviewee was the manager or one of the staff who had been responsible for IS adoption of the organization. The participants' selection was purposive rather than random or representative. Choosing interviewees purposively best enables the researchers to get all possible cases that fit particular criteria, and is appropriate when researchers would like to have an especially informative interviews or in-depth investigation. Purposive choice demands the researchers to think critically about the parameters of the interviewees and choose them carefully on this basis. (Silverman, 2001, p. 129; Silverman, 2005, p. 250; Neuman, 2006, pp. 141-144; Saunders, Lewis, & Thornhill, 2009, pp. 237-240)

The participants were selected on the basis that they had been exposed to the usage of IS in their business. This selection criterion would provide participants who would be able to tell of their experience in adopting IS for their businesses (Horn, 2009, p. 113). Potential participants were invited to participate in a one-to-one interview by phone. They were asked whether the interview could be conducted via phone or instant chat messenger, both at their convenience.

## 2.7 Data analysis methods

In this thesis, we used coding technique to analyze the interviews. Coding is a process to generate categories that contain pointers to the actual data. The process of coding starts by using descriptive coding where phrases, words, and sentences from interview transcripts are labeled using relevant words or phase. Since the categories are generating during the process, the codes have no association, and thus are called open codes. By creating open codes, the data begin to be categorized and patterns within the data are identified. (Miles & Huberman, 1994, p. 138; Saunders, Lewis, & Thornhill, 2009, p. 492)

Open coding was conducted by reading the individual interview transcripts. We highlighted phrases, sentences, and words that we believed being the answers for the questions we asked. We compared the answers to a particular question with the other respondents' interview transcripts. We also identified the answers to follow up questions. After we identified the answers to each interview guide question (and the follow up questions), we looked at the transcripts again to see if there was anything left that might be a new theme emerging from the data.

All the interviews were conducted and transcribed in Vietnamese, then analyzed in English. This had to be done to avoid losing contextual meaning of the data, which might loss if the data were translated to English beforehand (Sarosa, 2007, p. 80). The need to create a full record of the interview soon after its occurrence is important to control bias and to produce reliable data for analysis (Saunders, Lewis, & Thornhill, 2009, p. 339). Content analysis of the interview transcripts was used to extract answers given during the semi-structured interviews and identify new themes that emerged from the data. From the transcripts, a content analysis was conducted to discover the reasons for IS adoption, the process of IS adoption from decision making until evaluation, roles and influence of factors during adoption process, and an interaction between these factors.

## 2.8 Validity and reliability

Researchers should take into account validity and reliability while designing a study, analyzing results and judging the quality of the study (Patton, 2002, p. 20; Golafshani, 2003, pp. 597-607). Validity concerns with the degree to which a study accurately reflects or assesses how well a specific research method measures what it claims to measure. Reliability refers to the consistency of research findings, which means that data collection techniques or analysis procedure yields the same result on repeated trials. (Chisnall, 1997, p. 12; Yin, 2003, p. 37; Saunders, Lewis, & Thornhill, 2009, p. 157). The validity and reliability of this thesis stay at:

- Seven companies, which satisfied the criteria of SMEs specified in Vietnamese Law, were selected with different information systems adopted.
- The interviewees were selected on the basis that they had been exposed to the usage of IS in their business. Thus, the participants would be able to tell of their experience in adopting IS for their businesses.
- The interview questions were designed based on the model of IS adoption in SMEs from literature.

### 3 INFORMATION SYSTEM

#### 3.1 IS definition and discipline

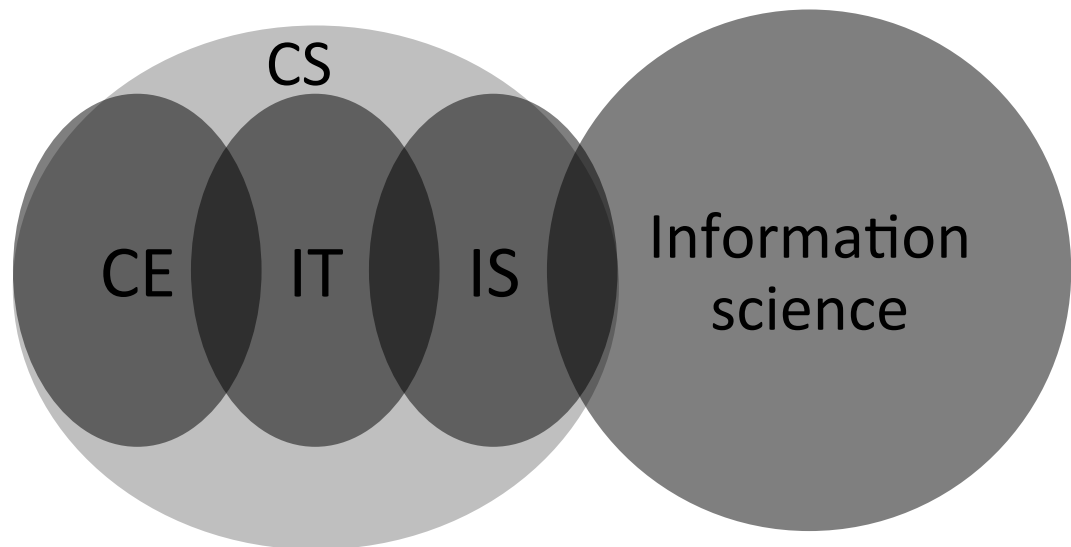


Figure 1 – Venn diagram of CS, CE, IT, IS, and information science (adapted from Archibald, 1975; Denning, 1999; Coy, 2004; O'Brien & Marakas, 2008; Henderson, 2009)

Some experts make a clear distinction between ISs, computer engineering, IT/ICT, and business processes. ISs are from IT in that an IS is typically seen as having an ICT component. ISs are also different from business processes. They help to control the performance of business processes.

Figure 1 illustrates the interrelationships of the disciplines.

Part of the difficulty in defining the term IS is due to vagueness in the definition of related terms such as system and information (Beynon-Davies, 2008, p. 100). A system can be defined as a collection of components that work together towards a common goal (Bociji, Chaffey, Greasley, & Hickie, 1999, p. 26).

Meanwhile, it is important to distinguish between data and information. Data is a raw fact and can take the form of a number or statement such as a date or a measurement. It is necessary for business to put in place procedures to ensure data

are recorded. For example, in a Credit Rating Agency, data about financial statements collected from other companies via phone, email, and website are analyzed and coded then entered into the system. Information is simply data that have been processed, i.e. acquired, recorded, organized, retrieved, displayed, or disseminated, so that they are meaningful. (Encyclopædia Britannica, Inc., 1997a, p. 312; Bociji, Chaffey, Greasley, & Hickie, 1999, p. 26)

IS is the primary vehicle for the purposeful, orchestrated processing of information. They are constructs that collect, organize, store, process, and display information from data in all its formats (text, video, and voice). (Encyclopædia Britannica, Inc., 1997b, pp. 624-625; Bociji, Chaffey, Greasley, & Hickie, 1999, p. 26)

In recent years, the term has often been applied to computer-based operations specifically, which permits extremely fast, automated manipulation of digitally stored data and their transformation from and to analog representation (Davenport, 1993, pp. 78-79; Encyclopædia Britannica, Inc., 1997a, p. 312; Encyclopædia Britannica, Inc., 1997b, pp. 624-625). In this sense, an IS is a group of interrelated components that work collectively. In other words, it is a type of socio-technical system being a mediating construct between actions and technology. (Bociji, Chaffey, Greasley, & Hickie, 1999, p. 27; Beynon-Davies, 2008, p. 93; O'Brien & Marakas, 2008, p. 4)

In terms of the components that undertake this activity, they can be classified into five basic resources of people, hardware, software, communications and data. People resources include the users and developers of an information system and those who help maintain and operate the system such as IS managers and technical support staff. Hardware resources include computers and other items such as printers. Software resources refer to computer programs known as software and associated instruction manuals. Communications resources include networks and the hardware and software needed to support them. Data resources cover the data that an organization has access to such as computer databases and paper files. (Bociji, Chaffey, Greasley, & Hickie, 1999, p. 27; O'Brien & Marakas, 2008, p. 4)

However, in this thesis, the IS definition is used interchangeably with computer-based MIS (as opposed to GIS and other specific IS (Schniederjans, Hamaker, & M.Schniederjans, 2004, p. 8; Henderson, 2009, p. 291)), i.e. it contains the ICT an organization uses and the way in which people interact with this technology in support of business processes. In this sense, the IS is essential to the success of commerce and business in the growing global marketplace.

An enterprise requires ISs to help it analyze the business, along with its environment, and formulate and check that it achieve its goals. These goals might be related to profitability, long-term survival, service provision, expansion, greater market share, and employee and customer satisfaction. An IS, which is sometimes regarded as providing competitive advantage, may also help the organization to achieve improved efficiency of its operations and effectiveness through better managerial decisions. It is eo ipso an important organizational resource. (Denning, 1999, p. 22; Avison & Fitzgerald, 2003, pp. 3-4; Hitt, Ireland, & Hoskisson, 2009, p. 12)

### 3.2 IS adoption process

Fundamentally, there are three different definitions of adoption of innovation. The first definition of adoption comes from Rogers (2003, p. 200), in which adoption means the commitment to implement innovation with the emphasis on the decision to adopt. The second definition is from the works of Bøving and Bødker (2003, p. 40) where adoption means using innovations as intended by the designers. In other words, only a full use of innovation as intended by the designer without modification can be called adoption. The third definition is suggested by Thong and Yap (1996, p. 162). They do not differentiate between full use and modified use of innovation in organizations. The adoption of innovation is defined as using innovation to support business. In the second and third definitions, the authors agree that unless the innovation is put into use, it is not an adoption.

To some extent, the adoption process of information system is also considered as the acquisition process of information system of a company. Rantapuska and

Ihanainen (2008, pp. 366-369) view the acquisition process, which is suggested by Lynne (2004) through organizational learning process. The acquisition process starts with externalization phase in which the organization prepares itself for the change. In this phase, SMEs should encourage practice that enables the participation of various people in the decision-making. Next is combination phase in which the candidate vendors/software products are selected. Then in internalization phase, the information system is implemented in the company. The actual tests of the information system should be implemented in-house and with real users and data. The final phase, socialization, is not only about educating the personnel to use the system, but also about supporting the software usage to spread throughout the organization.

In this thesis, we believe that the adoption of innovation is not only an acceptance of a new idea but also putting the idea to work. In other words, the information system adoption should include initiation, development and implementation phase. We define the adoption of information system as using computer hardware and software to support operations, management, and decision making in the organizations. Our model of information system adoption process, which is adapted from literature, is presented as following: the IS adoption process starts with decision-making phase, next is selection phase, then development phase and ends with implementation phase, which includes the staff training to use the system.

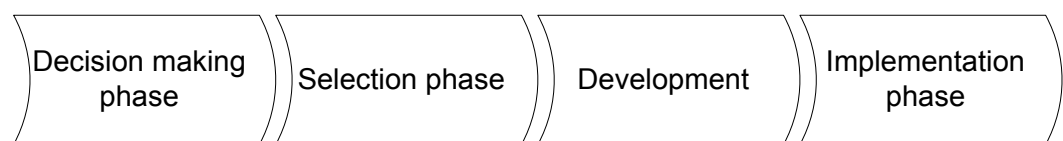


Figure 2 - Model of information system adoption process (adapted from literature)

### 3.3 IS success and failure

#### 3.3.1 IS Success

Poon and Wagner (2001, pp. 394-95) choose five factors to evaluate the success of the adoption of information system as following:

- Access: the information system is made available and users are given access to the system. Obviously, if the information system is not made available to the users by the developers, they cannot access it. Even if a system is available, complicated login procedures may prevent users from accessing it.
- Use: the information system is used by the target users. Logically, if the system cannot provide any benefits to the users, it may be abandoned by them, thus it cannot be considered as successful. Therefore, there is a need to ensure that the information system is actually used by its potential users. The frequency of using the system is also one of the factors that reflect the success of IS adoption.
- Satisfaction: users are satisfied with the information system, specifically the information produced by the system.
- Positive impact: the information system has positive impact on decision making, management and the organization.
- Diffusion: the numbers of people using the system increase after the initial users have tried to use the system.

DeLone and McLean (1992, p. 62) add two more dimensions of a successful information system adoption. They are quality of the information system, and quality of the information produced by the system (accuracy, meaningfulness, and timeliness).

### 3.3.2 IS Failure

Bussen and Myers (1997, pp. 145-146) mentions about the study of Watson and Glover (1989) in which they identify the following factors that evaluate to the failure of the information system adoption, “inadequate or inappropriate technology, the failure of the system to meet user needs, a lack of executive commitment, and executive resistance to technology”. User resistance is also a symptom of system failure as suggested by Senn (1978). For example, users may aggressively attack the system, rendering it unusable or ineffective, or they may simply avoid using the system. Davis et al. (1992) suggest “a sufficient condition for indicating the occurrence of a failure is that the organizational participants who have a stake in the information system (something to gain from the success of the information system or something to lose as a result of its failure) agree that the system is a failure”.

According to Ewusi-Mensah and Przasnyski (1994), information system failure is better defined as failure in usage or operation, whereas failure in the development of information system should be called project abandonment. There are three different types of project abandonment: total abandonment (all project activities are terminated before implementation), substantial abandonment (major modifications occur to the project before implementation), and partial abandonment (original specification is reduced without resulting in major changes before implementation).

A list of factors that cause the failure of information system adoption is identified by Watson et al. (1992, pp. 92-98). They conclude that IS failure is more likely to occur if there were a lack of executive support, undefined system objectives, poorly defined information requirements, inadequate support staff, and poorly planned evolution. Another cause of systems failure is the misspecification of the design referent group of user. Bostrom and Heinen (1977, pp. 27-28) provided an example of the system being designed for the top-level manager, leaving the secondary users with a system that does not meet their needs.

### 3.4 Factors influencing IS adoption

To understand the information system adoption process, it is important to identify the factors involved in that. A large number of literatures have documented factors influencing the IS adoption process, which can be categorized into internal and external ones. Internal factors are usually controllable by the SME's management while external factors are less controllable or even uncontrollable by SME's management.

#### 3.4.1 Internal factors

Internal factors include organizational culture, top managers, and employees.

Investigating a phenomenon such as information system adoption within Vietnamese context using theories developed mostly in western countries, cultural issue could be important to be explored and dealt with. Corporate culture, which includes the characteristics of human resources and the degree of openness to change, may influence the process of adoption of innovation (Minguzzi & Passaro, 2001, p. 182). The IS adoption process is a change within the organization that affects the culture of that organization and vice versa. Companies, which are open to accept new, challenging activities and encourage learning, are ready to support innovation and gain advantage over their competitors. Those with inflexible or holding-back culture, which are not likely to accept change, may limit their competitiveness. (Nguyen, 2009, p. 167).

In SMEs, the role of the top manager or the owner-manager is crucial to the firm since they make all decisions from daily operations to future investment. (Smith, 2007, p. 293). According to Bruque & Moyano (2007), and Riemenschneider & McKinney (2001), this also applies to the decision to adopt information system from "planning to implementing, evaluating and afterwards, maintaining and upgrading the system". This is to make sure that it meets the requirements set by the firm and satisfies the organizational goals such as improving staffs' performance, advancing decision making, and improving the quality of its products and services (Nguyen, 2009, p. 168). A number of studies emphasize that

the greater the top management understands information system, the more likely that they will adopt some information system for their business and the more successful the adoption (Bassellier, Benbasat, & Reich, 2003, p. 317; DeLone, 1988, p. 50). Benefits, costs and risks are always in top management consideration before decision to adopt an information system.

Employees are any firms' asset and have a major role on the rise or fall of the business. When employees are part of the process, they can provide helpful input for activities that they are dealing with every day and in which managers are not involved. Management should make sure that employees are fully aware and understand the impact of changes. (Anderson & Huang, 2006). The IS adoption process requires teamwork and acceptance across all departments within a firm. In other words, it requires top management support, clear communication to the employees, and the employees' acceptance of the changes.

#### 3.4.2 External factors

External factors consist of stakeholders (trading partners, suppliers and customers), competitors, and IS vendors/external consultants.

SMEs exist through the many interactions with their business partners, suppliers and customers, in other words, the stakeholders. These networks can be personal-networks or business networks. Through this network, firms can exchange, collaborate and share knowledge (Taylor & Pandza, 2003, p. 158). Information system adoption is not merely for the sake of company itself but also for their stakeholders. The adoption of information system should provide a means of communication and must be compatible between stakeholders, for example the adoption of Microsoft Office (Levy & Powell, 2004, p. 169). In some cases, customers can initiate information system adoption by applying pressure to the company (Drew, 2003, pp. 83-84; Sarosa, 2007, p. 156).

Competitive pressure may force SMEs to adopt information system, especially when a certain information system has shown positive results for many other competitors (Drew, 2003, pp. 83-84; Sarosa, 2007, p. 50).

The assistance of external experts, consultants or IS vendors are important to the adoption process of information system, not only for their support but also for the source of information. Their professional skills are needed because, as indicated by different studies, there is a lack of IT expertise and skills in most SMEs.

Quality advice from professional consultants when it comes to information system adoption is always useful for management or owner-managers since many of them do not have sufficient experience or understanding of IT. However, owner-managers should also take into consideration that not all suggestions or software packages fit with the needs of an individual business. Therefore, a clear definition or purpose behind pursuing the new information system is essential. (Levy & Powell, 2004, p. 22; Thong & Yap, 1996; Sarosa, 2007, p. 157).

## 4 SMALL AND MEDIUM ENTERPRISES AND INFORMATION SYSTEM IN VIETNAM

### 4.1 SMEs definition

The definition of SMEs varies between organizations and countries. Often, the definition relies on multiple criteria such as maximum number of employees, the annual sales, and total assets and depends on the industry (Levy & Powell, 2004, pp. 19-20). The following examples underscore the diversity of definitions used. In Zambia, SMEs can have up to 50 employees and sales of up to \$50,000. In Russia, SMEs include individual entrepreneurs and firms with fewer than 250 employees and sales of no more than \$30Mil. In Canada, they are firms with up to 500 employees and sales of up to \$45Mil at current exchange rates. In Korea, SMEs are enterprises with no more 1,000 employees and \$130Mil of sales. (Consultative Group to Assist the Poor & The World Bank Group, 2010)

In most European countries, the legal definition of SMEs, based on EU recommendation number 2003/361/EC, takes into account the number of employees, and either annual turnover or annual balance sheet as in Table 1.

Table 1 – SMEs definition – EC recommendation (European Union, 2003)

<b>Enterprise category</b>	<b>Headcount</b>	<b>Turnover</b>	<b>Balance sheet total</b>
Medium-sized	50 - 249	=< €50Mil	=< €43Mil
Small	10 - 49	< € 10Mil	=< € 10Mil

However, in this paper, we adopt Vietnamese's SMEs definition as presented in Table 2.

Table 2 – SMEs definition – Vietnam (Decree on Assistance to the Development of Small- and Medium-sized Enterprises, 56/2009/ND-CP)

Section	Small Enterprise		Medium Enterprise	
	Assets	Employees	Assets	Employees
I. Agriculture, forestry and fishery	<₫20Bil <sup>1</sup>	10-200	₫20-100Bil <sup>2</sup>	200-300
II. Industry and Construction	<₫20Bil	10-200	₫20-100Bil	200-300
III. Trade and Service	<₫10Bil <sup>3</sup>	10-50	₫10-50Bil <sup>4</sup>	50-100

#### 4.2 Characteristics of SMEs

There are four main characteristics of SMEs: limited resources, flexibility, innovation and personal influences (Welsh & White, 1981, pp. 2-12; Levy & Powell, 2004, p. 20).

The most common problem for SMEs is their limited resources in comparison with large enterprises. This problem is referred as *resource poverty* by Welsh and White (1981, p. 2). *Resources poverty* means that SMEs must be careful with their investment and spending. SMEs usually have limited options in their business, and must focus on their core business and expertise. This has led to the situation in which many SMEs outsource their non-core business activities such as IT to third parties (McNurlin, Ralph, & Bui, 2009, p. 3).

Despite their limited resources, SMEs are thought to be flexible and innovative organizations that are able to adapt quickly to new challenges and pressures. SMEs' flexibility is possible since their internal structure tends to be simple and informal. The informal management style means that decisions are made quickly,

<sup>1</sup> ₫20Bil ≈ €679,000 (as of March 2011)

<sup>2</sup> ₫100Bil ≈ €3,394,000 (as of March 2011)

<sup>3</sup> ₫10Bil ≈ €339,000 (as of March 2011)

<sup>4</sup> ₫50Bil ≈ €1,697,000 (as of March 2011)

since there are only a handful of employees to be consulted and there is not the complexity of bigger companies. The SMEs' organizational structure is often flat and allows direct communication between managers and staffs. SMEs' innovative feature mainly thanks to fierce competition with large companies or even other SMEs that require SMEs to change their service or products to survive within their niche market. While SMEs tend not to spend much in R&D, they can be more innovative than larger firms (Levy & Powell, 2004, p. 22).

In SMEs, managers often directly control all the resources and manage all the staff. Thus, the owner is likely to be involved in all aspects of managing a business. In other words, the personality of the owner/manager may dramatically influence all aspects of the business. Actually, many SMEs are family businesses. As a family business, the relationship between managers and staffs is like in the family; in fact, they are often closely related to other members of the company. The consequence of this is that SMEs may depend on a single decision maker, the manager, who is often also the owner of the SME.

#### 4.3 Reasons for IS adoption in SMEs

For many firms, the most common reasons for IS adoption is to provide a means to enhance survival, growth, competitive and innovation abilities (Bridge & Peel, 1999, p. 82; Levy & Powell, 2004, p. 196). SMEs adopt ISs for different reasons, because the functions of firms vary in different environments and they do not necessarily operate in the same way or have the same impact (Macpherson, Jones, Zhang, & Wilson, 2003, p. 259; Nguyen, 2009, pp. 163-165). Some authors argue that IS adoption is in response to flexible and dynamic markets, or reaction to an event, while others suggest that the change results from the pressure from customers and an emphasis on improving efficiency (Winter, 2003, p. 993; Corso, Martini, Pellegrini, & Paolucci, 2004, pp. 398-401; Levy & Powell, 2004, p. 201).

Another argument is that, according to Andries and Debackere (2006), the change is in response to the pressures from the internal and external environment. Internal factors may come from the requirement of staffs for better productivity or for the need of managers for decision-making. Internal changes include the life cycle or

maturity of the firm (stage of development) and external changes are survival or stability in the market. As firms go through different stages in their development process, they adapt to situations that suit them. Firms go through different stages and respond to changes throughout those stages. This includes the need to satisfy certain requirements or to respond or adapt to a required improvement. External changes refer to causes such as technology-push and market-pull. Here, technology-push implies an innovation that is well developed and the market, under the pressure of this advanced technology, is required to absorb it. On the other hand, market-pull refers to a social need where IT is developed to satisfy this need. (Nguyen, 2009, pp. 165-166).

Harrison, Mykytyn, and Riemenschneider (1997), in a study of 162 small businesses from different industries, figure out that the executives decide to adopt ISs for competitive purposes. Owner/manager can create a competitive advantage for their firms and differentiate themselves from their competitors. (Aragon-Sanchez & Sanchez-Marin, 2005, p. 297; Nguyen, 2009, pp. 165-166)

To summarize, we can say that firms seek IS enhancement for a purpose, which is to satisfy certain requirements or to respond to necessary improvements, which could arise from pressures from internal and external sources.

#### 4.4 SMEs in Vietnam

As a socialist country, Vietnam has made state-owned enterprises the mainstay of its industrial system. However, at its Sixth Congress in 1986 the Communist Party of Vietnam adopted its Renovation<sup>5</sup> policy of allowing the market mechanism to operate and permitting private and individual ownership of businesses (Murray, 1997, pp. 24-26; Sakai & Takada, 2000, p. 2; Phạm & Vương, 2009, pp. 96-97; Vương, 2010, pp. 31-32). Since then, small and medium-sized enterprises have emerged as a dynamic force in the development of the Vietnamese economy (Sakai & Takada, 2000; Vương & Trần, 2009, pp. 3-4).

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<sup>5</sup> Renovation (Vietnamese: *Đổi Mới*) is the name given to the economic reforms initiated in Vietnam in 1986, with the goal of creating a “socialist-oriented market economy” (Đào, 2003; Hoàng, 2007).

Over the past years, the number of Vietnamese SMEs has increased rapidly in both rural and urban areas, operating in almost all of economic sectors and filling the gap and shortage that have not yet been covered by large firms. The SMEs have been exploiting and mobilizing social resources at localities, creating jobs for a majority of laborers and contributing to set up a sound competition market. So far, Vietnam has had over 500,000 SMEs, accounting for more than 97 percent of total businesses, using over 30 percent of total investments, employing over 50 percent of laborers and producing over 40 percent of consumer goods and exports. SMEs have continuously increased their contribution to the growth of the GDP. In 2010, the SMEs contributed 47 percent GDP and nearly 40 percent of the state budget, playing an important role in the country's socio-economic development (Vương & Trần, 2009, pp. 3-4; Lê, 2011).

Vietnamese government has been continuously providing favorable conditions for small and medium sized enterprises. There has been a great variety of programs aiming at assisting SMEs to raise the quality of products and services, develop trademark, improve competitive capability and enhance international integration. The usage of IS in SMEs' business processes is extremely encouraged by the state to improve their administrative and productivity as well as push up international integration process. (Lê, 2011)

## 5 CASES OVERVIEW

### 5.1 Cinema Company T

Cinema Company T is a Vietnamese joint-stock company producing films and managing movie theaters. Penetrating into premium film section in May 2005, Company T has been meeting the increasing entertainment demands of the Vietnamese audience. At the time being, Company T is serving client at three Hollywood standards cineplexes locating at central Ho Chi Minh City.

The company has many departments, among which are Cinema Department (manage cineplexes), and Marketing Department (focus on marketing-related activities). In 2007, Marketing Department hired a software company to design the website and online booking system for Company T. After 2 months, the website and online booking system were delivered under the form of an all-in delivery, which included its source code. Marketing Department was responsible for maintaining of both website and online booking system. Precisely, an employee in the Department who had advanced IT skills took care of maintaining the website and online booking system. However, the maintaining somehow was not conducted properly. There were continuously unfixed bugs of both website and online booking system. In 2010, a new Marketing Manager came and immediately requested improvement to the website. This time, Marketing Department only concerned about the website. Cinema Department took care of the renovation of the online booking system. They purchased a new system, which cost tens of thousands US dollars. In this thesis, we only presented the adoption of the new website.

### 5.2 Bottled Water Manufacturer U

Bottled Water Manufacturer U runs its business as B2B, providing bottled water to inter-state transportation companies in the Mekong River Delta. The idea of adopting an inventory control system came from U's competitor in an informal

meal<sup>6</sup>. From the consultancy of both his friend (the competitor) and the developer who had built the system for that friend, U's owner/manager (Mr. A) decided to adopt it. Mr. A hired the new company of that developer (Mr. B) to build the system. During the implementation phase, Mr. A was asked to pay more for a change from packaged software, which had failed to meet his business demand to customized software. He was angry and intended to abandon the system. Only after B's manager offered him a new customized system at half-price and free six month maintenance, he allowed the project to continue. The system helps the company a lot, just to mention two main things: managing the company's material, working tools, half-finished products, and finished products; reporting the situation of any items in the warehouse at any time to assist the owner managers to adjust the production timely.

### 5.3 Interior Design Company V

Company V, which established in 2004, specialized in interior design for houses, hostels, bars, restaurants, cafés, showrooms, offices.

The accounting system was adopted in the same time with the foundation of the company. The owner-manager purchased the software from his friend who owned a software development company. The software was working quite well until the upgrade of company's computers in 2006. Bugs arose but the software company provided no solution. When the new chief accountant came, she abandoned the software because she did not know how to use it. She preferred using Microsoft Excel. From then on, the accounting system was left aside, still in the computers but it was not updated any more.

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<sup>6</sup> Informal meal (Vietnamese: *nhậu*) is a cultural identity of Vietnamese in business particularly and daily life generally. In an informal meal, people gather, drink wine and eat specially food in turn, and have a chat of common interest. A large amount of contracts are negotiated and signed in informal meals. It is somehow analogous to the golf and tennis business culture in the West.

#### 5.4 Credit Rating Agency W

The company specializes in providing corporate credit reports on businesses in Vietnam. Their products and services are extremely useful for foreign companies who are in need of information about Vietnamese companies. The company has two offices, one in Hanoi and one in Ho Chi Minh City.

Before the adoption of the system, inputting, editing, updating, searching and categorizing was time-consuming and not easy, especially as the number of reports reached thousands (so far, the company has a database of more than 20000 Vietnamese companies). The owner/manager nurtured the idea of a system to facilitate those processes for a long time but until beginning of 2009, the idea was realized. Three internal developers in Hanoi office developed the system.

#### 5.5 Exterior/Interior Design Company X

Company X specialized in exterior and interior design for hotels, bars, restaurants, cafés, showrooms, offices, houses and projects.

The truth was that the company X had used Microsoft Windows Server 2008 for years; but it was, surprisingly, unlicensed. It was only after recently that an “inspection team” of the government discovered the usage of illegal Microsoft Windows Server 2008 and forced the company to purchase a licensed one.

#### 5.6 Rubber Company Y

Company Y is a state-owned company specializing in manufacturing of rubber products, for example automobile, motorcycle tires and tubes. The adoption here is from unlicensed Microsoft Office 2003 to OpenOffice.org in which government played an important role.

### 5.7 Pesticide Joint Stock Company Z

Z started up as a state-owned company in 1976. In over thirty years of development, Z went through important changes. In the early days, the company was organized into three factories and one Research and Development center in the Mekong River Delta, only where the products of the company were launched.

Z has been unceasingly growing up though facing vital trials by the market economy; numerous new products were developed, and the production continuously increased. The company later promoted expanding activities throughout the country with two factories established in Hanoi and Hue.

In 2000, Z Quality Management System was certified ISO 9001:2000 by Quacert and SGS Organization, and it has passed the review every year since then. Z also expanded their market to some Asian countries, such as Taiwan, Singapore, Malaysia, Burma, Bangladesh, Cambodia, etc. and established several international relationships, which were not only for trading, but for technical cooperation and technology investments as well. Thanks to those international relationships, three joint-venture companies were founded. In 2006, from a state-owned company, Z equitized into a joint stock company, but the state still held 51% of the share.

### 5.8 Summary

In this part, we presented briefly the companies and their contexts for the adoption of the information systems. The companies and their adopted system were listed in Table 3.

Table 3– List of companies and their adopted systems

COMPANY	SYSTEM ADOPTED
Cinema Company T	Website
Bottled Water Manufacturer U	Inventory control system

Interior Design Company V	Accounting software
Credit Rating Agency W	CRIS
Exterior - Interior Design Company X	Licensed Windows Server 2008
Rubber Company V	OpenOffice.org
Pesticide Joint Stock Company Z	Accounting system
Pesticide Joint Stock Company Z	ERP system

## 6 CASE ANALYSIS

In this chapter, we examine detail of each company's adoption process of IS to gain a thorough understanding of how the adoption happened, reasons for the adoption, and the factors that surrounding the adoption process.

### 6.1 IS Adoption Process

#### 6.1.1 T and the website

As we knew, company T had already had a website, built in 2007. At that time, Marketing Department required to have the source code thus they could maintain the website themselves. However, the Department somehow neglected it. As the new Marketing Manager came at the end of 2010, she immediately requested improvement to the website. After a discussion with her staff, she proposed the idea to the CEO for his approval. Then, the adoption of new website started. A partner of the company was hired to design the new website, partly because of their discount offer.

*I chose a new one. They were our partner so we could receive discount.*

*(Marketing Manager)*

One member of the Marketing Department staff, who graduated from a design University in Singapore, was assigned to supervise the development and implementation phase of the new website. There were mainly that employee and the two web developers from the partner company who involved in the processes. The manager only provided final approval, which allowed that the new website replaced the old one in the server.

*They sent me some layouts to get feedback. Until I agreed on the layout and the manager approved it, they started coding the website. I preferred a simple design this time. After coding about 80%, they upload the website online. It was not public yet. Only they and Marketing Department had access to the website. I supervised them closely to make sure everything was exactly as I wanted. If I did not like at some points, I gave feedback right away.*

*It took two months to design the website. We still used the old website during the designing process. It took one day to replace the old website in the server. Then was another month to fix bugs.*

*(Staff / Senior Marketing Executive)*

This time, the source code of the website was no long required by the Marketing Department. According to the Marketing manager, it was better to let the software company responsible for maintaining. The adoption was successful.

*The website looks good now, simple, and professional.*

*(Marketing Manager)*

#### 6.1.2 U and the inventory control system

The idea about the inventory control system came from U's competitor in an informal meal<sup>7</sup>.

*My competitor introduced the system to me. While we were eating in a restaurant, he talked about the system, its efficiency and effectiveness, and advised me to adopt a system like that.*

*(Owner-manager)*

The owner/manager of U (Mr. A) told his co-owner (wife) about adopting the system. After that, Mr. A asked his friend (the competitor) to contact the developer who had built the system for his company. The developer (Mr. B) had moved to a new software company that also developed an inventory control system. Thus, he took his chance to introduce his new company's product. After some informal meals and meetings, Mr. B's new company was contracted to implement the system in Mr. A's premise. Mr. B offered Mr. A a package of both hardware and software. However, Mr. A decided to purchase the hardware

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<sup>7</sup> See footnote 6, page 26 **Error! Bookmark not defined.**

(computers) himself according to specifications recommended by Mr. B. Mr. B visited Mr. A's premise two or three times to observe the business process and studied how A calculated the inventory manually. After two weeks since the contract signed, Mr. B installed the system into Mr. A's computers and trained the company to use it for testing. Mr. A found it was not working properly. Some items in the warehouse, as the new system reported, did not match with figures from the paper-based system (manual calculation). He asked the developer to fix it. The system was updated and tested for another 2 weeks but still the same problem occurred. This made the manager angry.

*I told him to fix it or I would abandon the system.*

*(Owner-manager)*

The problem seemed worse as Mr. B explained that the software was a commercial off-the-shelf product with *limitation in changing* and proposed Mr. A to spend more money on a customized software. Mr. A angrily required a meeting with Mr. B's manager.

*I told him (Mr. B's manager) that I didn't know in advance what COTS or customized software was. Anyway, I did not care about that. We would not pay for a fault system. The manager apologized for that and requested a meeting with us.*

*(Owner-manager)*

At the meeting, Mr. B's manager offered to continue developing a customized inventory control system for Mr. A at half price and six month of free maintenance. Mr. A agreed. Another developer joined the project. There were many visits of the developers to study the business processes carefully. The whole company of Mr. A participated in the development phase of the project.

*They asked everyone in the company. However, mainly my wife showed them how we ran the production, imported, exported, and calculated everything manually. We explained and gave them whatever they needed.*

*(Owner-manager)*

It took another 2 months for the system to be implemented again. Mr. A tested the system for a month. It worked well this time. During that month, two developers arrived quite regularly to check what the company U did and fix some bugs. All

the employees were trained to use the system until they were fluent at using it. The adoption of the customized inventory control system was successful.

*My employees helped each other, some learnt quicker than the others did. The training guy was very helpful and nice.*

*We still do manual calculation to be sure. However, it indeed works well. It is worth the money.*

*(Owner-manager)*

The system helped the company a lot, just to mention two main things: managing the company's material, working tools, half-finished products, and finished products; reporting the situation of any items in the warehouse at any time to assist the owner managers to adjust the production timely.

#### 6.1.3 V and the abandoned accounting software

This case seemed *out of* the scale of this thesis since we presented the problems of the accounting software during the using phase after its adoption by company V. However, this case had a noticeable element: *a new hired employee could refuse to use the adopted software* because she did not know how to use it and adopted new software which approved by the owner-manager.

According to a senior accountant, the owner/manager decided to adopt an Accounting software in 2004, same time with the starting up of the company. He purchased the software from his friend who owned a software development company. The accountants had no choice but to use the software. The implementation process was simple.

*A guy from the software company installed the accounting software into our computers. We had two training weeks to get familiar with the software. To be frankly, we already got used to many kinds of accounting software (which were popular in Vietnam) in accounting courses.*

*(Senior accountant)*

The software was updated to new version annually. If the software had any problems, the accountant contacted the software company to have them fixed. In the first two years, the software had some minor bugs that were fixed easily by the

software company. In 2006, company V upgraded their entire computers. Major bugs arose. The software company tried to fix them but failed.

*After my company had upgraded the computers, major problems arose. Sometimes, when I was entering data, the software suddenly logged out or not responded for a while; or the system failed to save what I had inputted. Those were annoying. We asked the software company to fix those but still no solution.*

*(Senior accountant)*

When the new chief accountant came in 2008, she abandoned the accounting software. It was simply because she did not know how to use the software. She preferred using Microsoft Excel. Somehow, the owner/manager allowed her to use Microsoft Excel instead of the accounting software. The other accountants had no objection with that since they also knew using Excel in accounting, let alone the software's annoying bugs. The accounting software, which was still in the computers, was no longer updated by the software company. To some extent, the adoption of the accounting software was not a failure. In the first two years, it was working quite well. However, compatible errors with new hardware and the presence of the new Chief Accountant were main reasons preventing it from servicing since 2008.

*It is still there, in the computers, but no more updating from the software company. That could save some money for the company, about ₱600.000<sup>8</sup> per year.*

*As long as the Chief Accountant is here, we still use (Microsoft) Excel.*

*(Senior accountant)*

#### 6.1.4 W and CRIS

To begin the case of Credit Rating Agency W, we would like to introduce the basic business process of an office before the adoption. There are three levels: Credit Reporting Specialist (staff), supervisor and manager. An order means a report (Microsoft Word file) about some companies.

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<sup>8</sup> ₱600.000 ≈ €20.5 as of March 2011

The main job of an employee is to collect information of Vietnamese companies via web, phone, mail, personal relationship or any other methods that work. Starting a working day, the employees had to check a Microsoft Excel file that contained the orders of every staff. In each row, there was the name of the ordered company, origin of order (for example, order from France, England), deadline of report, and a note to inform whether the company was *new* or *would-be-updated* from latest report. If the company was new, the employees had to search for all required information, then used Microsoft Word to input that information. If there had been reports about the company, the employee had to obtain the latest report (*would-be-updated* report) as a reference in a shared folder named *Updating Reports*, then updated all required information and saved in a new Microsoft Word file. When the reports were finished, the employees had them verified by the supervisor before placing them in a shared folder named *Completed Reports*.

A manager was responsible for receiving orders from customers, allocating those to employees in an Microsoft Excel file, verifying (roughly) and sending finished reports in the folder *Completed Reports* to the customers. After receiving orders, the manager searched for the ordered companies in a simple database-system. If the ordered company was not in the database, he noted the company as *new*; otherwise, as *would-be-updated* then downloaded the latest reports (Microsoft Word files) from the database-system. Those reports would be mailed to the supervisor afterwards.

A supervisor had four responsibilities. Firstly, he placed *would-be-updated* reports, which were received from the manager into *Updating Reports* folder. Secondly, he verified employees' finished reports carefully before he placed them in *Completed Reports* folder. Thirdly, he inputted information of those verified reports into the database-system, for example: company's name, owners, field of business, etc., for later searching and updating, and attached the correlatively verified report.

That was the basic daily working process before the adoption of the system. Here were some of their statements:

*I could not search the ordered company. The manager took care of that. Sometimes, a company should be "would-be-updated"*

*but it was “new” in the Excel file. If I had done that company, I might remember. If not, I had to search for all information again. That wasted a lot of time.*

*Inputting, slow! Updating, slow! Sometimes I forgot the deadline. That was really bad. I had to check the Excel file every day. I could see orders of others. They could see mine as well.*

*(A member of staff)*

*Searching depended on the database-system. If the system informed that the ordered company was not there, how could I know that it indeed was there? There were too few key words and fields that I could search. There were mistakes some times.*

*Often, I had to remind the staffs about deadline. They kept on forgetting.*

*(A manager)*

*Staff had no access to the database-system. They had information in Word file; I had to re-input that into the system. That was... stupid! ”*

*(A supervisor)*

Obviously, inputting, editing, updating, searching and categorizing was not easy and time-consuming with old system (Microsoft Word and database system), especially as the number of reports reached thousands. To facilitate those processes, at the end of 2008, the owner/manager asked the IT Department in Hanoi office to build a new system. Three internal developers in Hanoi office were responsible for adopting of CRIS. The system was a web application that operated in the Intranet of the company. With advantage to be internal staffs, they understood the business processes thoroughly, and were easy to elicit requirements from other staffs, supervisors and managers. The development stage did not take long. After six months from the request of the owner-manager, in May 2009, the system was *online*. Each one (employee, supervisor, manager) had an account to log in the system. They were encouraged to use, test, report bugs, and contribute ideas to improve the system.

Initially, an employee could input directly into the system, which then automatically created a Word file containing all that information. They could also search for the ordered companies themselves. However, the number of searchable

fields and key words was limited since the database was transferred from old database-system. Obviously, developers wanted to increase the number of searchable fields and key words. However, they could not do that without the re-inputting of existing reports, which up to 10000 into the new system. Being unable to synchronize with existing reports was main drawback of the system. The company had to recruit temporary employees to re-input almost 10000 existing reports into the system whereas current employees continued with their work. Until May 2010, the system allowed users to search with variety of fields and key words.

*I could search with tax code, business license... Or I could check how many companies that a person had shares.*

*(A member of staff)*

Although with the presence of the new system, employees checked orders in a Microsoft Excel file until September 2010. From that time, after logging in, they could see their orders in *My Order* section and the attached latest reports if those companies were *would-be-updated*. Each employee could only see his/her own orders. The system also reminded the employees about deadline of each order. The system had some problems, for example:

*I inputted everything but the printed report lacked some information. It happened some times, not every time. Annoying since I had to input again. Or when I input the company's tax code and business license, the system should inform us if that information had been inputted but it did not.*

*(A member of staff)*

One noticeable (and funny) issue arose in the office in Ho Chi Minh City. The government had a role in that. The office in Ho Chi Minh City was located in an area where cutting off power happened quite often. The office had to equip UPS to prevent suddenly computers' shutting-down. However, there was a time that the UPS was broken whereas the company did not buy another one yet. At that time, power shortage often caused re-inputting of data if the employees had not saved their work yet. The system did not save the work if the *Save* button was not clicked. Thus, the developers had to revise the *saving module* that automatically enabled saving in background during the inputting. After many updates and revision, the system has been working well since the end of 2010. With the

adoption of the system, work performance increased and stress decreased considerably.

*Inputting is faster... Updating is faster. Before, we had to name the Word file ourselves. Now the system names the file for us... The system does everything for us. I log in. I know what I did on yesterday and what I need to do on today, including incomplete orders and new orders as well. It also reminds us about the deadlines of orders. It saves us a lot of memory.*

*(A member of staff)*

*The system helps us to serve the customer better.*

*(A manager)*

#### 6.1.5 X and Microsoft Windows Server 2008

As mentioned in previous chapter, the use of illegal Windows Server 2008 of company X was discovered by the inspectors of the government recently. The inspectors also found out that the company had used a great amount of unlicensed software, from Microsoft Office suite to Adobe Creative Suite. The reason was as usual.

*They are cheap. Especially, (Microsoft) Office is so basic but costs a lot of money.*

*(A Senior designer)*

The installation of unlicensed Microsoft Office and Adobe Creative Suite was blamed on, surprisingly, the employees. The owner/manager emphasized that he purchased computers with licensed operation system and the employees (designers) were responsible for installing software that they needed. The managers claimed that he was not aware of that pirated software.

The punishment was undisclosed to the interviewer (the author). However, we knew that the company purchased a licensed Windows Server 2008.

*There was a discussion of managers. One proposed to use Linux (a GNU/Linux distribution), but finally we purchased a licensed (Microsoft) Windows Server 2008. Anyway, we got used to it and licensed (Microsoft) Windows Server 2008 was good; we had no problem with that. Adobe software (Adobe Creative Suite) is also a must. We cannot design anything without them. The company has to buy for us sooner or later. Some designers*

*have to work at home. However, we are thinking about Microsoft Office. They may be unnecessary. We are using Open Office (OpenOffice.org) currently. No problem with that. They are similar to Microsoft Office.*

*(A Senior designer)*

#### 6.1.6 Y and OpenOffice.org

The situation of Rubber Company Y is somehow similar to the above company. Company Y is a state-owned company whereas the above company is a private-owned and the adoption here is from unlicensed Microsoft Office 2003 to OpenOffice.org.

*(Microsoft) Windows Server 2008 is licensed, accounting software is licensed, and inventory management software is licensed. In general, "big software" is licensed. Only basic Microsoft Office software was unlicensed. Every time a new version of Microsoft Office is marketed, we installed it in every computer.*

*We did not install Microsoft Office 2007. It was a big change from 2003 version. We were afraid that other employees who don't have IT skills would face difficulties in using it.*

*(IT Department Manager)*

Things changed in March 2008. The government *encouraged* state-owned company to use open source software, for example OpenOffice.org. The CEO asked the IT department to be responsible for adoption of OpenOffice.org in the entire company. In fact, there was a meeting between the CEO and the manager of IT department. The CEO would like to know whether OpenOffice.org could replace Microsoft Office 2003, which was being used illegally in the company (as well as many other Vietnamese ones). The IT manager himself only heard about OpenOffice.org. He told the CEO that he would test OpenOffice.org in IT department for a month before providing advice for the CEO. After one month, in a report sent to the CEO, he claimed that it was definitely feasible to replace Microsoft Office 2003 with OpenOffice.org. There were three main reasons for the feasibility of the adoption of OpenOffice.org in the entire company. Firstly, OpenOffice.org was similar to Microsoft Office 2003. Secondly, almost departments were using basic functions of word processor and spreadsheet

applications, only Accounting Department used *more than basic* functions of spreadsheet application. However, OpenOffice.orgCalc could handle those functions smoothly. Finally yet importantly, OpenOffice.org was free. The CEO immediately approved to adopt OpenOffice.org in the entire company. From September of 2008, all the Departments have used OpenOffice.org. Initially, IT staffs installed OpenOffice.org in all computers and did not remove Microsoft Office 2003 yet. They recommended the employees who often used Microsoft Office 2003 to get used to OpenOffice.org. Then IT staff both learnt more about the new software by themselves and guided other staff in every department. Thanks to the similarity of user interface between OpenOffice.org and Microsoft Office 2003, the staff easily got used to the new software. The IT staffs studied the usage of Microsoft Office 2003 in every department to set deadline to remove Microsoft Office 2003 in each one.

*Certainly, there were objections. Some kept on using Microsoft Office 2003. We told them that they had to learn the new software or they could ask for permission of CEO to continue using Microsoft Office 2003. We trained them step by step. The software was not different from Microsoft Office 2003. They learnt it easily.*

*We had different deadlines to remove Microsoft Office 2003 for each department, depending on how they use Microsoft Office 2003. Most of departments used basic (Microsoft) Word, (Microsoft) Excel and (Microsoft) PowerPoint. Only Accounting Department used more-than-basic functions of Excel. However, those functions could be done easily by OpenOffice.org Calc. In addition, they had their own Accounting application, thus they did not need (Microsoft) Excel much. In six months from installing OpenOffice.org, we removed Microsoft Office 2003 from all computers. Everyone was okay. No one died!*

*(IT Department Manager)*

#### 6.1.7 Z (mid-1990s) and the accounting system

Until the mid-1990s, all the business workflow of Z had been in paper, from transactions to contracts, from financial decision making to accounting. Acknowledging the need of computerizing a part of this labor-intensive work, the top executives decided to invest in an accounting system. The employees were not

involved in the decision making process, yet they were informed and interested about this.

After meetings, the Board of directors decided to outsource the accounting system to an independent developer, which is, actually, a relative of the current CEO. He visited the Accounting Department many times to observe the business process and staffs' activities, as well as examine some sample input and expected output in order to understand them all thoroughly. He then started developing the system in FoxPro 2, the popular programming language and database management system for accounting related software at that moment, in such a manner that it strictly reflected what the business workflow was. The product somehow met the requirements, and was approved by the Board of directors to be tested in parallel with the old paper-based system.

In the parallel running phase, sometimes the developer sat next to the Department's staff to guide them using the new system to do their daily tasks. After months of being crosschecked, the system was officially put into use. The staff adopted the system passively, but was generally happy with it. Ever since, when Z recruited new accountants, they were trained by a senior employee. The adoption process, in general, was successful.

#### 6.1.8 Z (2010) and the ERP system

In 2010, seeing the need of better control and more competitive edges, the top managers decided to conduct an ERP pre-feasibility study. A pre-feasibility study team was formed, whose task was to evaluate various available business solution against the company workflow. The chosen ERP package was OpenERP, which was a popular open source system among Western SMEs.

Although OpenERP lacked of Vietnamese accounting system (VAS), the team managed to develop a simple generic VAS module in a short time. However, the main problem appeared that, willing to change as the company was, it is theoretically impractical to demand changes from current businesses partners. The status quo of business workflow in the company is quite bureaucratic, and the

transactions are over-flexible. For instance, according to the contract, Z provide its partner 8000 units on the first day of each month, and its partner have to take all of them out of Z's warehouse no later than the fifth day of the same month. However, its partner usually left until the end of that month, or even next one, depending on the sales. Z also had several family enterprise partners, whose turnover is so small and unstable that they hardly paid back payables on time, yet Z had no intention to apply penalties on late payment. It should be noted, once again, that Z is a 51%-state-owned company.

To make the status quo even worse, some modules of the system were *malum prohibitum*. The legal environment made the paper-based transactions a little bit easier, but was main hurdles for the computer-based ones. For example, VAS had some dualistic accounts<sup>9</sup> that never existed in Western countries' account system. The team had a meeting with the CEO, and some solutions, including customizing the ERP package to match the current business workflow, was discussed. However, no solutions were considered, because "when we automate a mess, we have an automatic mess", said a member. The adoption process stopped at the decision making phase.

## 6.2 Reasons for Information System adoption

In Cinema Company V, a website had been adopted already when the new marketing manager came. Often, when a new manager was assigned, he/she must do something or improve something immediately, in this case the adoption of new website. However, it was not only because of that. Firstly, the old website, which was considered as *the company's face*, was *boring and not attractive*, whereas the competitor had a more attractive and professional website. Secondly, there were complaints of customers in the forum about long unfixed bugs of the website. Thirdly, a small-scale survey conducted within the company and in the forum supported a renovation of the website. The new marketing manager claimed that, "If we can make something better, why shouldn't we!"

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<sup>9</sup> Dualistic accounts are, in VAS, those that have both credit and debit side after balancing.

In the case of Bottled Water Manufacturer U, the idea about the inventory control system might come from a competitor but the real need of the company for such a system was the main reason for the adoption. Inventory management is extremely important to any manufacturer. Before the adoption of the system, the co-owner manager (wife) had to calculate the inventory manually, putting a lot of pressure on her. Although she *has made no mistake since the beginning*, she was still a human being, which meant there were always possibilities of mistakes. The system aimed at saving time and memory for the owner-managers, assisting the decision-making, and avoiding excess or deficiency of production. We could state that the owner/manager (husband) decided to adopt the system because of the real need of his business as well as caring towards his wife. There was a possibility of another reason that came from Vietnamese culture. Vietnamese have a proverb “Con gà tức nhau tiếng gáy” (in English: “The cocks rival each other for crowing”), which means, “I must have better thing than you have (or at least the same)”. In this case, because an inventory control system had been adopted successfully in the competitor’s company, U’s owner/manager also desired to have the same system for his business.

The reason for adoption of accounting software in Interior Design Company V was simple:

*To support our business, I suppose. Anyway, accounting system has many benefits.*

*(V’s senior accountant)*

We knew that the owner/manager adopted the software in the starting up of the company. The software was purchased from his friend who owned a software development company. We might guess that the adoption of the accounting software resulted from personal reasons. However, it was an undeniable fact that the software itself had many benefits to the company that made the manager decided to adopt it.

In the case of Credit Rating Agency W, the company’s database continuously increased, reached more than 10,000 reports of Vietnamese companies at the end of 2008. There was an urgent appeal for a system to facilitate the process of

inputting, editing, updating, categorizing and reporting. The system aimed at reducing the working amount of managers, supervisors and staffs, advancing the managers' decision making more effectively and reasonably as well as providing accurate evaluation of staffs' performance. Before the adoption of the system, staffs and managers had to design their *own system* (or checklist) to remember what they did on today and what they would do on the day after. "I have a lot of things to remember. It is good that the system remembers things for me", said an employee. Thanks to the system, stress reduced and performance improved. According to a manager, the system also helped the company to serve the customers better.

When it came to the case of Interior Design X, we were confused since there were quite many reasons for two times of adoption of Microsoft Windows Server 2008. In the first adoption, Microsoft Windows Server 2008 was adopted because the managers were familiar with Microsoft Windows than other operating systems. However, it was pirated because of the cheap price. There would be no second adoption without the discovery of the government about the illegal use of Microsoft Windows Server 2008 in the company. In other words, the command of the inspectors from the government was the main reason for the second adoption of Microsoft Windows Server 2008, this time, *licensed*. In a board of directors' meeting, a manager proposed a GNU/Linux distribution instead but once again, Microsoft Windows Server 2008 was selected because they did not want any major changes to the Server system.

The situation of Rubber Company Y was somehow similar to the above company. Y is a state-owned company, thus the policy of the government has strong influence to the policy of the company. The government encourages state-owned companies to use open source software to reduce cost and avoid using pirated Microsoft software. In this case, there was *encouragement* from the government to the company about using of OpenOffice.org instead of pirated Microsoft Office 2003. Rubber Company Y used much software to support their business process. Except from Microsoft Office 2003, other software was genuine. Since Microsoft Office 2003 was considered as *basic*, not *big* like the other software (accounting, inventory management), it was accepted to use even illegally. The adoption of

OpenOffice.org met three criteria of the managers. Firstly, it was suitable to the policy of the government. Secondly, the fact that the company had to pay for licensed Microsoft Office 2003 if they continued using it was somehow unfeasibly and uneconomically whereas OpenOffice.org was entirely free. Finally yet importantly, OpenOffice.org was quite similar with Microsoft Office 2003, which meant there would be no big change to daily working habit of the employees.

The reasons for IS adoption in Z was, like in many case above, to support its business. In the mid-1990s, the aim of the accounting system was to reduce redundancy, reduce labor waste and enable automation. In the paper-based system, there is eo ipso no way to copy-and-paste redundant data from one book to another. Thanks to the system, the data was duplicated without any limitation, and, ipso facto, saved a lot of labor work. In addition, some computation routines were coded, automatically calculated the desired result as soon as there was input. *Business support* expanded its meaning in Z in 2010, when the company wanted not only cost-decrease, but also sales-increase. The aim of ERP was to increase the employees' overall performance, real-time management, customer satisfaction, so that the sale, and finally, the profit, was to increase.

### 6.3 Factors influencing Information System adoption process

In this part, we examined which factors surrounding the adoption process of each company. The factors, which used to evaluate the success or failure of the adoption, were also presented.

#### 6.3.1 T and the website

*Manager* in this case should be understood as a department's manager, not the owner-manager. Here, we could see the role of both internal and external factors clearly in the decision making process. As soon as recruited, the Marketing manager immediately requested improvement to the website. According to her, the website was considered as *company's face*, and it was *boring and unattractive* whereas competitor's website looked attractive and professional. In addition, there

were complaints of customers about continuously unfixed bugs of the website. The manager consulted her staff before sending the request to the CEO for approval. There was no mention about the cost but the benefits of the new website. The company readily paid for the adoption of the new website. In the IS vendor selection process, a partner of the company was selected for two reasons. Firstly, they had some contributions to marketing programs of the company. Secondly, they offered discount.

Staff played an important role as it came to the implementation phase. A staff in the Marketing Department, who had knowledge in IT and designing, was assigned to supervise the designing and implementation process.

*I told one of my staff to responsible for this. He graduated from a design school in Singapore. He was good at IT as well.*

*(Marketing manager)*

The adoption was successful. Satisfaction of both manager and staffs was the main factor.

*The website looks good now, simple, and professional.*

*(Marketing manager)*

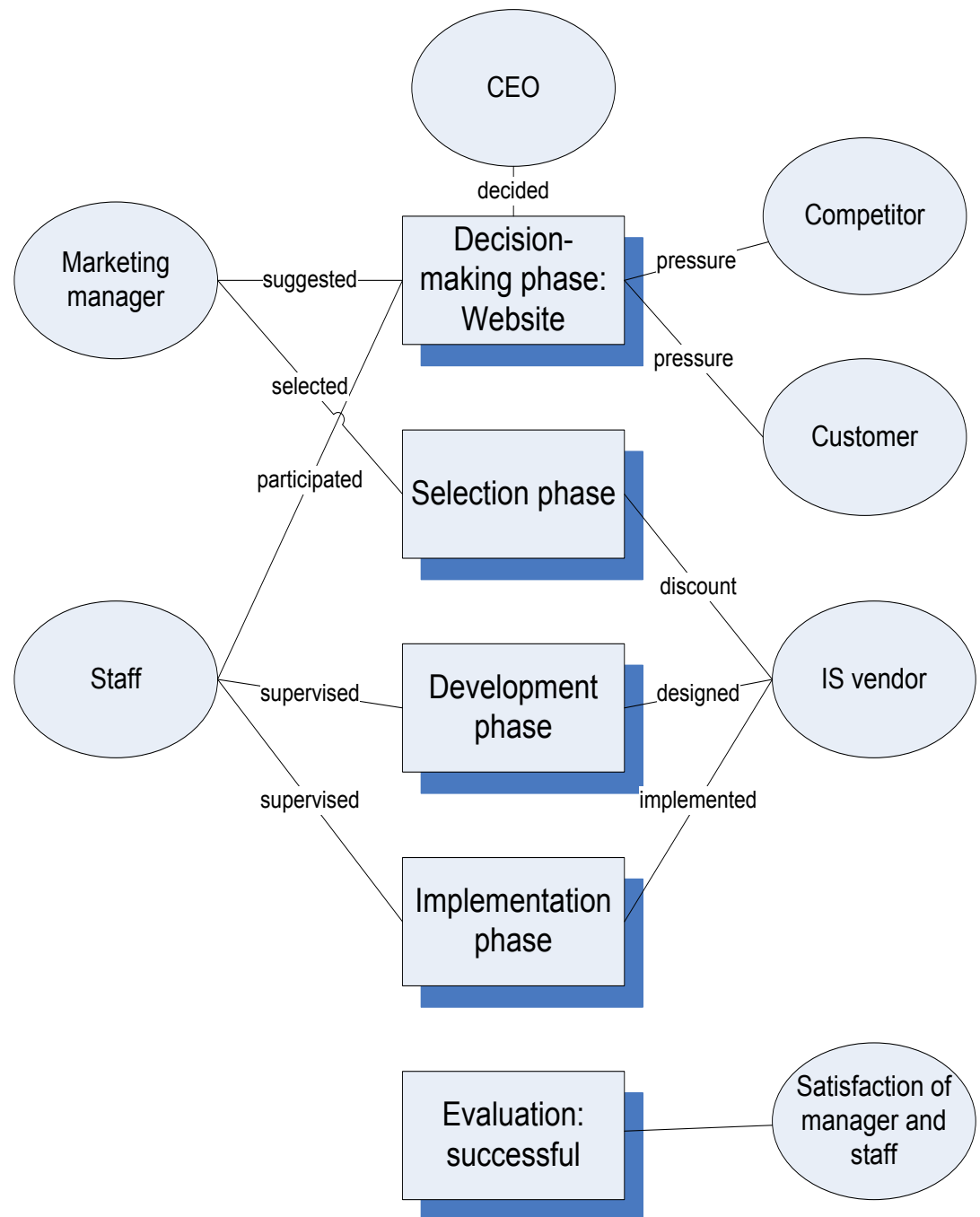


Figure 3 – Factors that influenced the adoption process of the website in Cinema Company T

### 6.3.2 U and the inventory control system

In the decision making process, there was presence of four factors: competitor, consultant, cost and owner-managers (Mr. A and his wife). Firstly, the competitor, who was also Mr. A's friend, advised him to adopt an inventory control system.

The fact that such a system had been adopted successfully in the competitor's premise was a major driving force for Mr. A's decision to adopt the system. Secondly, the consultant was the developer who had built the system for Mr. A's friend (the competitor). He moved to a new company which also developed a similar system, thus he took chance to introduce his new company's product to Mr. A. Thirdly, the cost was important to Mr. A. The adoption of inventory control system would be reconsidered if the cost had been much more than he intended to spend. Finally, after a discussion with his co-owner/manager (wife), Mr. A decided to adopt the system. There was no input of staff in the decision process.

*I only told them that I bought an inventory control system, it would be delivered soon. They would be trained to use the system.*

*(Mr. A)*

The implementation was not successful. Some items reported by the system did not match with manual calculation of the owner manager. The developer had not studied the U's business processes carefully, thus he thought that his company's system could be suitable with U's business context. Mr. A was angry and intended to abandon the system as the developer asked him to pay more for customized software. As mentioned above, cost was important to Mr. A. Any change to cost would make him reconsider the adoption. The first adoption failed.

Only after the software company's manager offered Mr. A a customized system at half price and 6 months free maintaining, he let them continue developing and implementing the system.

In the second adoption, another developer joined the project. There was participation of the whole company in the development phase.

*They asked everyone in the company. However, mainly my wife showed them how we ran the production, imported, exported, and calculated everything manually. We explained and gave them whatever they needed.*

*(Mr. A)*

The adoption was successful, thanks to three main reasons. Firstly, the developers studied the business processes thoroughly. Secondly, owner-managers were determined to adopt the system. Finally yet importantly, the software company was determined to recover its reputation. Once again, satisfaction of the owner-managers was the main factor to evaluate the adoption.

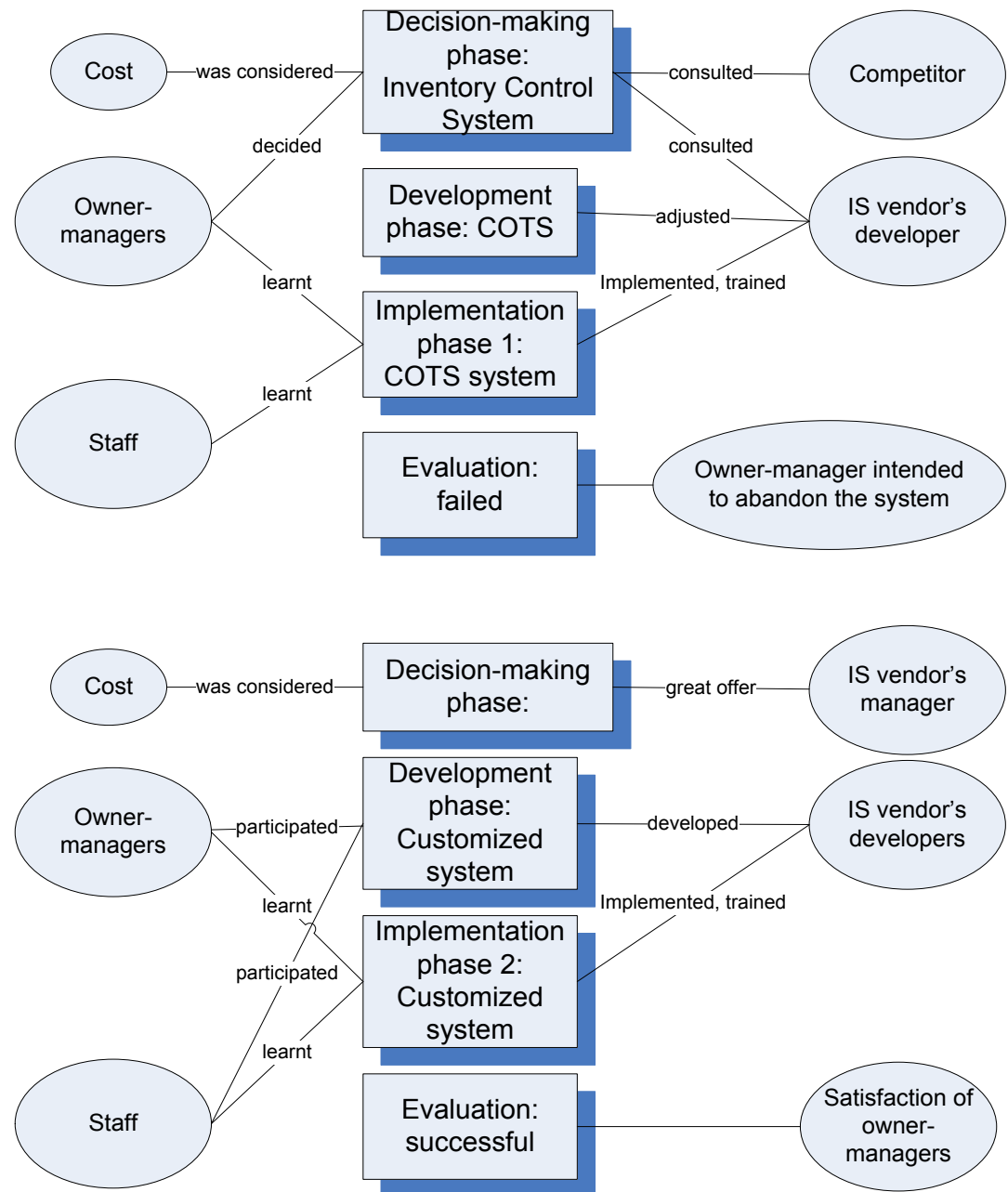


Figure 4– Factors that influenced the adoption process of the inventory control system in Bottled Water Manufacturer U

### 6.3.3 V and the abandoned accounting software

As we knew, the accounting software was purchased in the same time with the foundation of the company. The owner/manager was the only one who was involved in the decision making process. At that time, the accountants had no choice but to use the software. Staff had no contribution in the decision-making phase as well as the implementation phase.

*A guy from the software company installed the Accounting software into our computers. We had two training weeks to get familiar with the software.*

*(Senior accountant)*

However, when it came to the adoption of Microsoft Excel, a member of staff became the main actor. In 2008, a new Chief Accountant came. To the other accountants she was their manager, but to the owner-manager, she was one of his staff. She did not know how to use the current accounting software, thus she asked for permission from the owner/manager to use Microsoft Excel instead. It was unknown how she could convince the owner-manager. Anyway, the system was abandoned. Other staff had to use Microsoft Excel too. In the second adoption, staff took the key role in both decision-making phase and implementation phase.

*She told the manager that she didn't know how to use the system. She preferred using Microsoft Excel. The owner/manager agreed. Since we also knew how to do accounting with Excel, let alone the system's errors, we had no problem abandoning the system. We all are using Excel now. Still okay!*

*(A senior accountant in Interior Design Company V)*

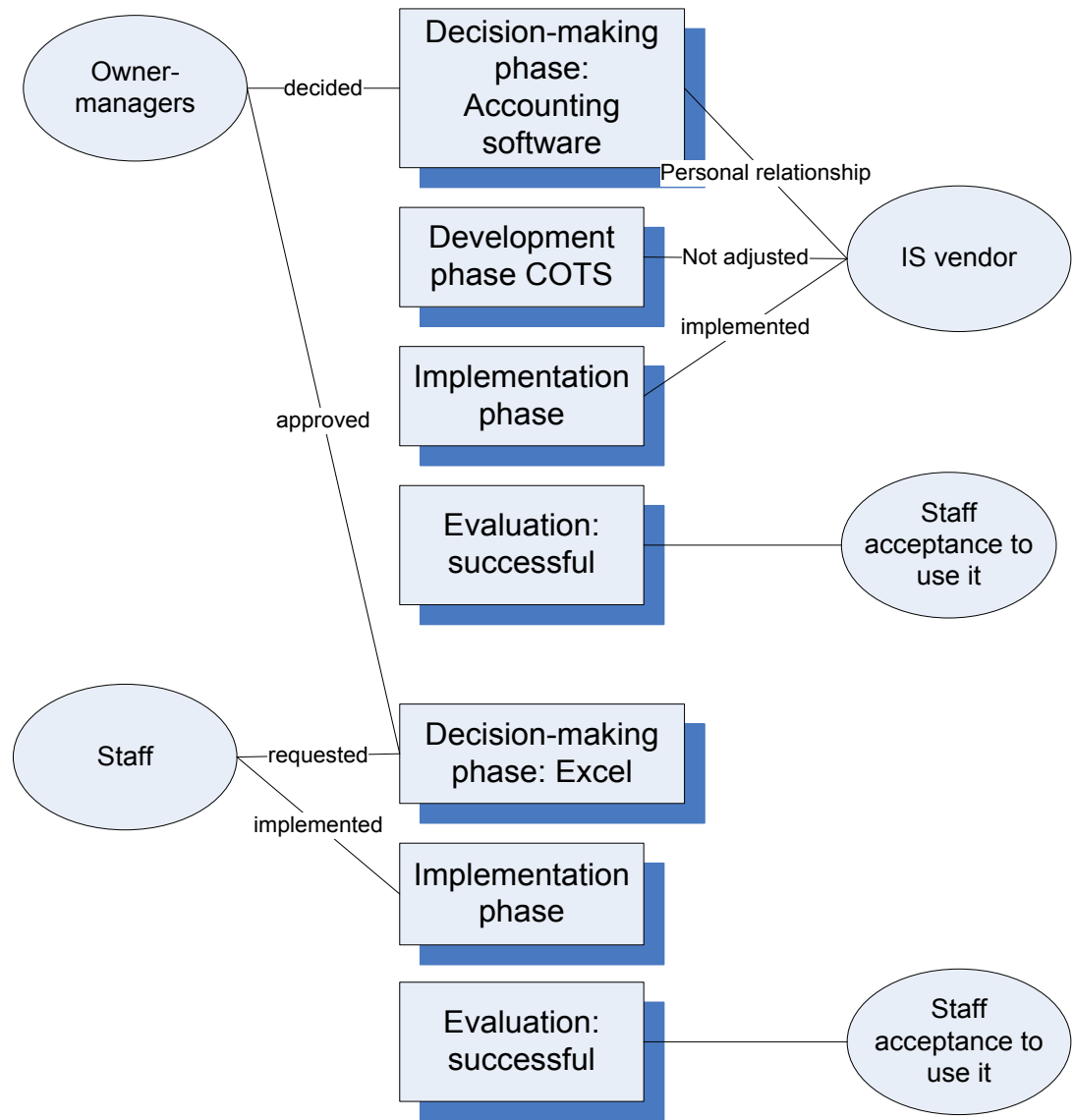


Figure 5– Factors that influenced the adoption process of the accounting system and Microsoft Excel in Interior Design Company V

#### 6.3.4 W and CRIS

The company was really in need of a system to facilitate the process of managing, inputting, editing, updating, searching and categorizing. That led to the decision of the owner manager to adopt CRIS. He was the only one involved in the decision making process. The owner/manager had a sufficient understanding of what the system can do for his business and what his business required from the system. Cost of the system was not mentioned to the interviewer (the author)

but we knew that the owner/manager was ready to spend for the system since its great benefits to the company.

Staffs were essential to the development and implementation of the system. Here, staffs meant three internal developers and other staffs who were main users of the system. Three internal developers were responsible for building, implementing, updating, maintaining the system while the other staffs used, informed bugs and contributed ideas to improve the system.

A noticeably external factor that affected the adoption was the power shortage. In Vietnam, electricity network is managed by Electricity of Vietnam, a monopoly state-owned corporation. In many areas, not only in rural areas but also in municipalities like Hanoi and Ho Chi Minh City, cutting off power often happens without prior notice. That causes many problems to entrepreneurs. With Internal Rating Agency W, regular power cutting off affected the inputting process of the staffs. Thus, developers had to revised *saving module* to allow automatically saving in background during the inputting.

*Power was cut off quite often. My work was off too. I hated to input again. We informed IT guys about the problem. Then they improved the “saving module” which allowed automatically saving in background.*

*(A senior Credit Reporting Specialist)*

The adoption of the system was considered successfully. Work performance increased and stress decreased considerably. Customers were served better, also thanks to the system.

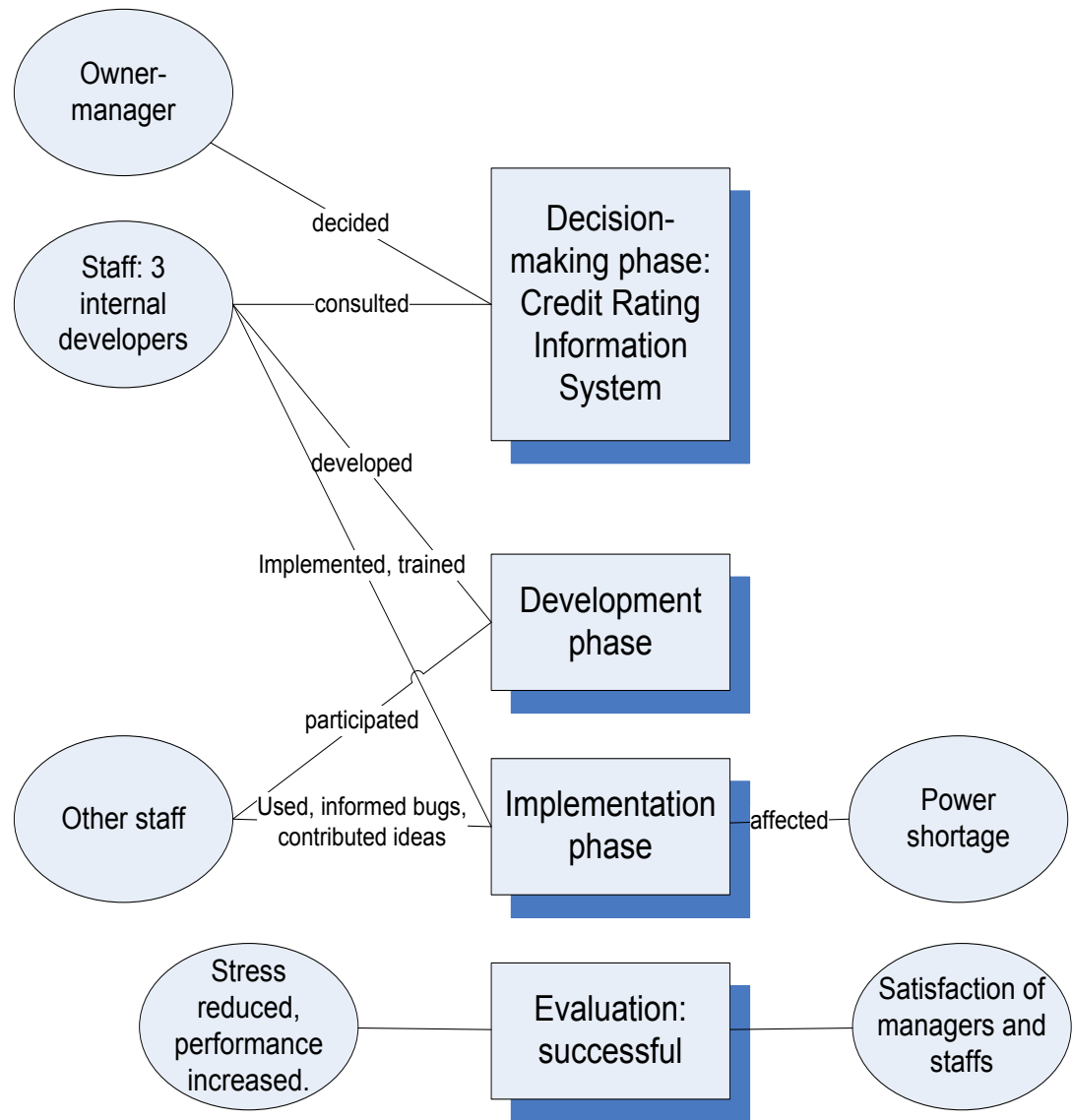


Figure 6– Factors that influenced the adoption process of CRIS in Credit Rating Agency W

### 6.3.5 X and Microsoft Windows Server 2008

In this case, we only mentioned main factors that affected decision-making phase of two times of adoption.

In the adoption of unlicensed Windows Server 2008, the role of managers was important. Although the managers had adequate awareness of all the risks involved when using illegal software, especially server level, they still let it

happened. The main reason was that it would be costly to purchase a licensed one.

In the adoption of licensed Windows Server 2008, the government had an important role in the decision-making. After discovering the use of illegal Windows Server 2008, the inspector of the government forced the company to remove it right away. The company did not want any big change to the server, thus they had to purchase a licensed Windows Server 2008.

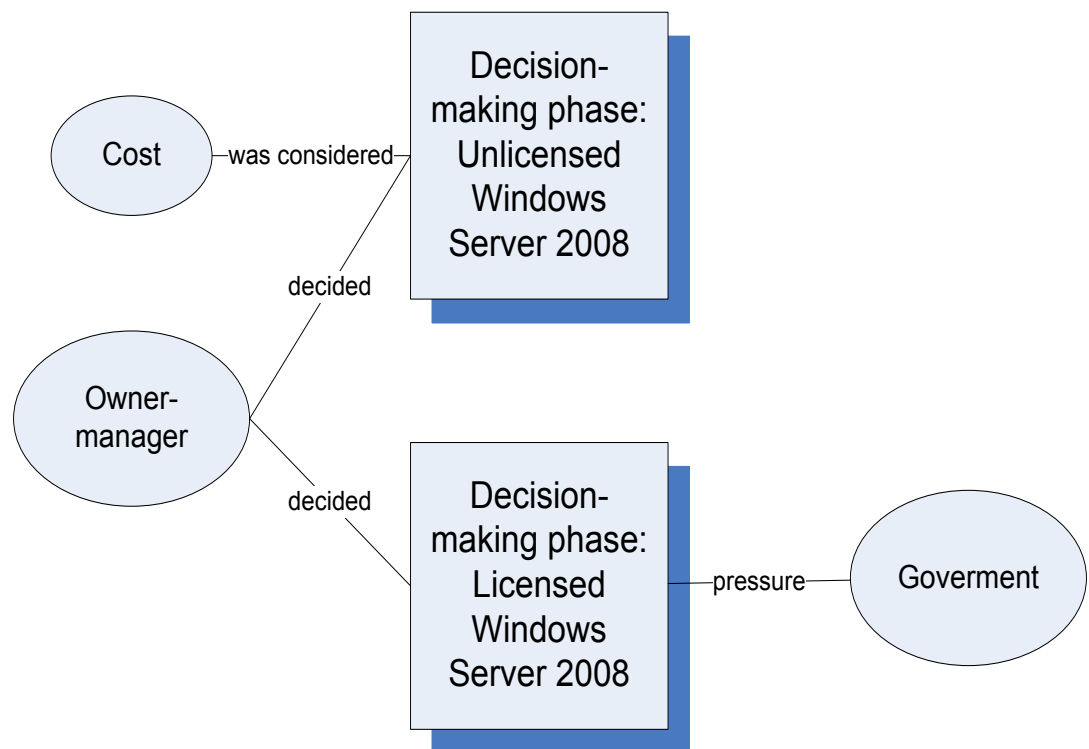


Figure 7 – Factors that influenced two decision-making phases of Windows Server 2008 in Exterior/Interior Design Company X

#### 6.3.6 Y and OpenOffice.org

Once again, government had influence to the decision-making process. However, the role of CEO and IT department was also important.

The government encouraged state-owned companies to use open source software, for example OpenOffice.org. To follow that encouragement, the company's CEO

consulted with manager of IT department about Open Office. After testing the software in his office for a month, the IT manager sent a *Feasibility Report* to the CEO about using of OpenOffice.org. The CEO immediately approved to adopt OpenOffice.org in the entire company. Announcements in which stated that IT department was responsible for the adoption of OpenOffice.org, were sent to every departments.

In the implementation phase, some staffs had objection to the replacement of Microsoft Office 2003 by OpenOffice.org. They continued using Microsoft Office 2003. However, with the help of IT persons, they gradually got familiar with the new software.

The adoption was successful. Staff acceptance was among main factors that evaluate the adoption. From September of 2008, all the Departments have used OpenOffice.org. The use of OpenOffice.org could save a lot of money for the company in changing to licensed Microsoft Office.

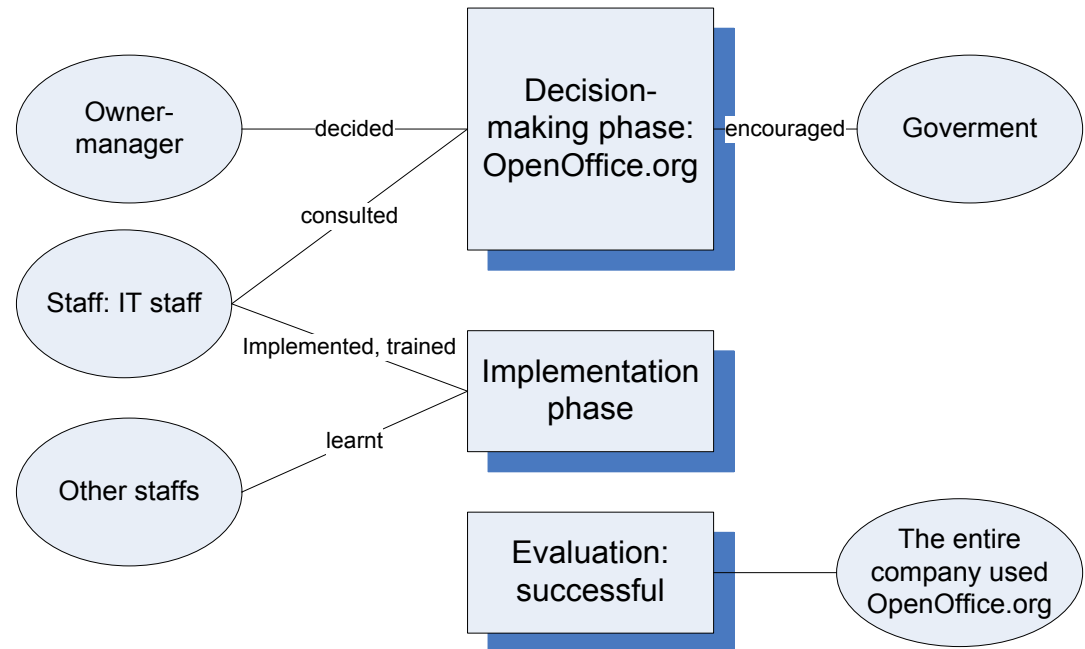


Figure 8 – Factors that influenced the adoption process of OpenOffice.org in Rubber Company Y

### 6.3.7 Z (mid-1990s) and the accounting software

In the decision making phase, the employees only had an indirect contribution; they sometimes complaint about their repeated task. It is the top executives who had a meeting and decide to *do something*. The employees were not informed about the software until the developer came, but they had no reasons to avoid or resist it. In this phase, the choice of the external developer is obviously subjective, as he was a relative of the current CFO.

In contrast, the employees were sine qua non in the development phase, because they expressed their needs to the developer, as well as helped him in design and testing. The developer was also active enough to collect sufficient information for the system. The role of the executives here was only to allow the developer to approach the company, and to approve the system after collecting feedback from the employees.

The implementation phase was such that the developer, who obviously knew the best how the system worked, sat next the employees to guide them in a one-to-one training session, to which both parties committed. Those employees later became trainers for new recruited staff.

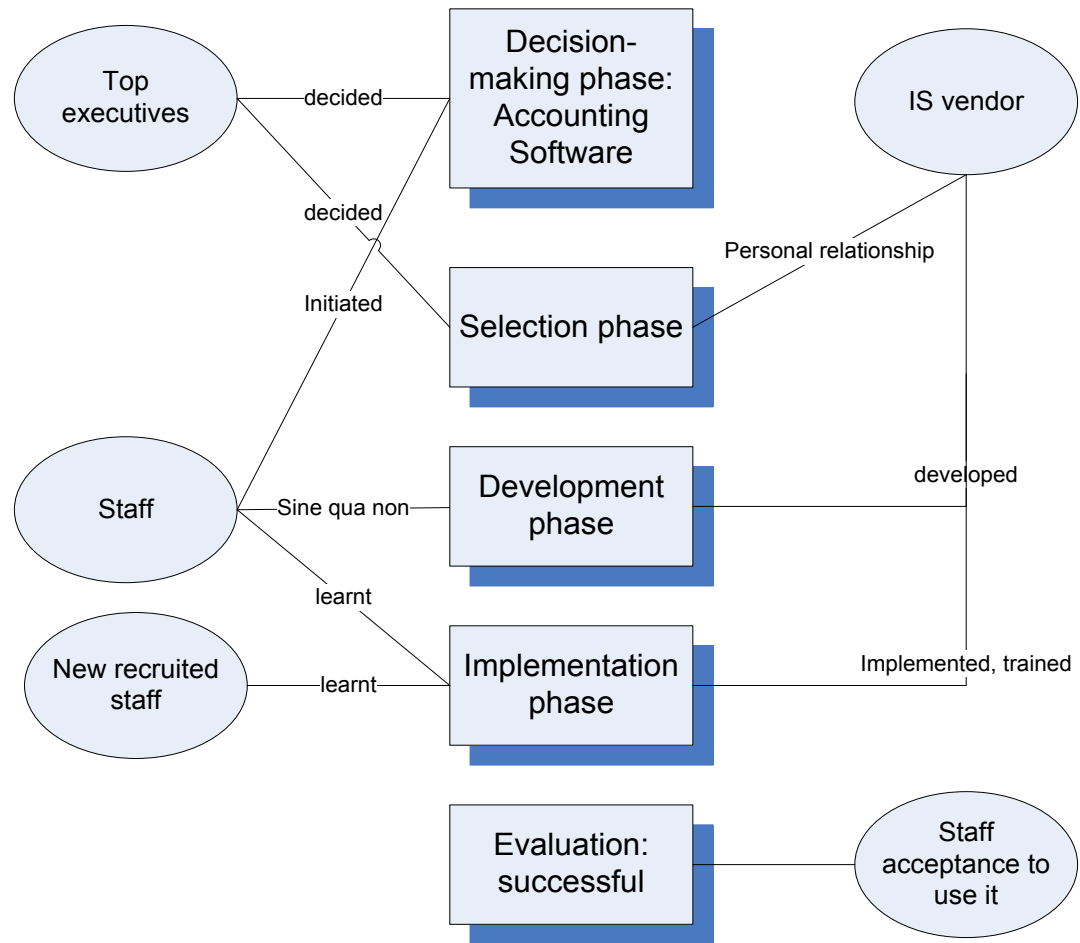


Figure 9 - Factors that influenced the adoption process of accounting software in Pesticide Joint Stock Company Z

### 6.3.8 Z (2010) and the ERP system

The idea was actually initiated by a student who was going to have his internship in the company. However, the CEO, as he said, had been thinking about it for quite a long time. Consequently, an ad hoc pre-feasibility team was formed quickly. As soon as the team has made its decision on ERP package, they came across quite a lot of hurdles, including technical, managerial, external (partners) and legal. Mitigating technical and managerial ones as the team was, they knew there was no way the company risked itself to do its business against its partners and legal environment. All the team members and the top executives agreed that the project had to stop there.

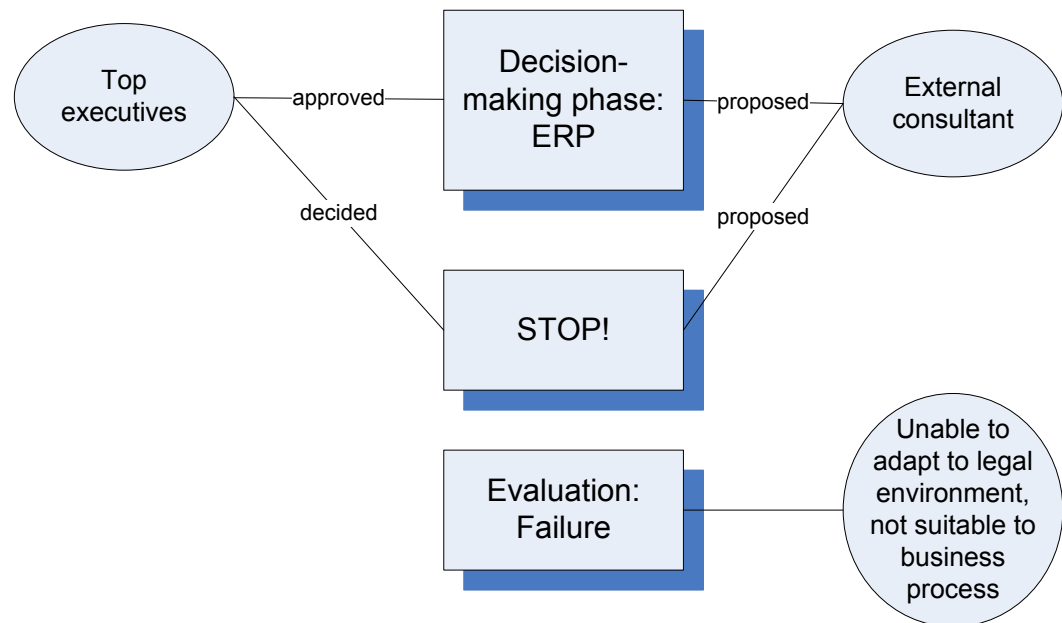


Figure 10 - Factors that influenced the adoption process of ERP system in Pesticide Joint Stock Company Z

#### 6.4 Summary

So far, we have analyzed the cases with the focus on our research questions of *how*, *why* and *what factors*, concerning the IS adoption process in Vietnamese SMEs. First of all, the IS adoption process, which happened as it should according to the reviewed theory, had four phase in general, idea-initiating, decision-making, development, implementation. In some cases, the company used cost-of-the-shelf system, thus the development phase was bypassed. In some others, the adoption process stopped at decision-making phase because of inevitable hurdles. Secondly, the main and foremost reason for IS adoption is to support business, including cost-decrease and sales-increase. However, there were some legal and personal reasons as well.

Last but not least, there were external and internal factors that influenced the adoption process. Those factors came from the system itself; the company and its staffs; the external stakeholders, competitors, consultant; and even the government.

## 7 CONCLUSION

### 7.1 Thesis overview

In Chapter 1, we presented the background of the thesis which emphasized the importance of SMEs in economies as well as the importance of information system in supporting business. However, there was no study specifically dealing with information system adoption in Vietnamese SMEs. This thesis was conducted in order to provide the readers a thorough understanding of the adoption process of information system as has happened in Vietnamese SMEs.

Chapter 2 concerned the research design and actual data collection and analysis. This thesis had three purposes: describing the adoption process of information system in Vietnamese SMEs, explaining the reasons for adoption, and exploring which factors that had affect to the adoption process. We used qualitative approach with semi-structured interviews as the data collection tool. The use of qualitative approach was considered suitable for understanding a complex phenomenon such as IS adoption. Especially in one case company, there was participant observation of a member of the authors.

In Chapter 3, we reviewed the literature about information system adoption, what factors that used to evaluate the success or the failure of the adoption, and factors that influenced the adoption.

In Chapter 4, we provided the definition of Vietnamese SMEs which is different from the definition of European SME, characteristics of SME and the situation of information systems in Vietnamese SMEs.

An overview of each case company was given in Chapter 5. Then in Chapter 6, we went into detail of the adoption process of information system in every case company. We structured the analysis according to the three main questions of this study. The analysis part started with the information system adoption process in each company, continued with the reasons for adoption, and ended with the factors surrounding the adoption process.

## 7.2 Results

### 7.2.1 RQ1: Why do Vietnamese SMEs adopt ISs?

From our studying of eight information system adoptions in seven companies, we found a variety of reasons that lead to the decision to adopt the information system in Vietnamese SMEs.

Mainly, Vietnamese SMEs adopted ISs to support business, improve productivity and advance decision making of top management. This statement was demonstrated by the cases of inventory control system in U, CRIS in V, accounting software in V and Z, and ERP system in Z. In addition, the need for a system might arise when firms went through different stages in their development process. That was the case of W in which the increase of their database required a sufficient system to facilitate searching and management of the database. Pressure from customers and competitors are considered among the main reasons that lead to the adoption of a new website in T. Also, a competitor had a role in the adoption of inventory control system in U. However, we evaluated that the pressure from customers and competitors in those two cases were not clear enough. There should be more studies about the impact of customers and competitors on the decision to adopt information system in Vietnamese SMEs.

The above reasons were mentioned already in the literature. However, there was a reason that could not be found in any literature that had been developed in Western countries: pressure from government, which was the main reason for the adoption of licensed Windows Sever 2008 in X and OpenOffice.org in Y.

### 7.2.2 RQ2: How are ISs adopted in Vietnamese SMEs?

As we presented, the IS adoption process started with the decision-making phase, next is the selection phase, and ended with implementation phase, which included the staff training to use the system.

In the decision making phase, there could be participation of staff in decision making or not. In the case of T, W and Y, top managers discussed with staff about their intention to adopt the information system. In the case of U and V, top managers solely made decision after the consultancy of external factors. It is safe to say that the participation of staff in the decision making phase depended on two factors: their IT knowledge and the top managers' knowledge about the information system. For example, U's owner manager already gained knowledge about the inventory control system via external consultancy, thus he had no need of advice from employees who only used computers at basic level. However, Y's CEO did not know anything about OpenOffice.org, thus he needed consultancy of the IT manager before he could decide to adopt it or not.

The selection of IS vendor or the software suited to business requirements were mostly included in the decision making phase. In the case of U, V, W and Y, the top managers had selected the IS vendor or the software before the decision to adopt was made. However, in the case of T and Z, the selection of IS vendor came after the decision to adopt an information system. The IS vendors might increase their chance of receiving the contract if they provided great offers or actively proposed a partner relationship with the companies.

In the development phase, it depended on the requirement of the companies that the information system was a COTS product or was developed from scratch. Whatever it was, the information system was required to handle business processes with minimal change to the business processes themselves. If the software could fulfill that mission, it would be abandoned sooner or later.

In the implementation phase, it depended on the type of information system that required participation of a member of staff, or many staff, or the entire company. For example, the implementation of the website in T only needed supervision of a member of staff who had advanced knowledge of IT whereas the whole staffs of W (including supervisors and managers) were encouraged to use, test and provide ideas to improve the Credit Rating Information System.

We defined the adoption of information system as using computer hardware and software to support operations, management, and decision making in the organizations. We would like to add one more element to that statement: ‘to respond to an external pressure (for example, government)’.

### 7.2.3 RQ3: What are factors that influence IS adoption process in Vietnamese SMEs?

As mentioned in the literature, there were internal and external factors surrounding the information system adoption process. Internal factors are organizational culture, top management and employees. External factors are stakeholders, competitors and IS vendors/external experts. From our analysis, besides top managers/owner-managers, employees, financial resource, customers, competitors and IS vendors/external consultants, government also has influence to the adoption of information system.

***Top manager/owner-manager.*** It seemed that solely top managers/owner-managers made all the decisions with little or no input from the staff. They might ask what their staffs think, but it seemed that it did not affect their decision. U and V are examples for that. This might be due to the centralistic style of management common in Asian countries as well as being a common feature of SMEs, especially family ones. This decision making style might make the IS adoption easier, because all the decisions were made and enforced on the staff. However, there were also cases in which top managers were in need of consultancy from employees before making decisions. T, W and Y are examples for that.

Literature suggested that managers often considered benefit, costs and risks before adoption of any information system. From our studying, system benefits and costs are two factors which receive the most consideration of Vietnamese SMEs managers in decision making process. The owner-manager had a sufficient understanding of what the system can do for their business and what their business required from the system. In the case of Credit Rating Agency W, cost of the system was not mentioned to the interviewer (the author) but we knew that the

owner-manager was ready to spend for the system because of its great benefit to the company.

It seemed unusual for the SMEs to adjust their business processes to accommodate an IS. Top managers demanded information system to handle their business processes with minimal change to the business processes themselves. That was the cases of Z with the ERP system and U with the inventory control system. The top managers required the systems to be customized to match with their business processes.

***Financial resource.*** Lacking of financial resource was one of the barriers to information system adoption in Vietnamese SMEs. With the usage of unlicensed software in some companies, although the managers had adequate awareness of all the risks involved, they still allowed its use because it would be costly to purchase a licensed one. A sudden increase in cost could prevent the information system implemented in the company.

However, most participants were able to allocate some of their capital for the needed system. With companies using pirated software, they often blamed for the shortage of financial resource but that was only one side of the story. If needed, the company could afford the IS. The usage of unlicensed software came from the habit of some top managers or from their perception about the importance of the software. For example, to some companies, accounting system is important, HRM system is important, Inventory Management System is important but Microsoft Office, although it is the most popular software in Vietnamese companies, was not worth the money.

***Employees.*** Employees' rejection of information system adoption can be a problem as suggested in the literature. From our studying, top managers often decided to adopt the system and the employees would usually comply. There is one case in which a new recruited staff refused to use existing software; however, that had been already four years since the adoption of that software. Employees had no objection to the adoption of information system because they knew that the use of the system would assist them in their daily working. Employees' readiness

was also not a problem. Most of the participants' employees were university graduates or at least college graduates. Although the types of information system in companies were far different with those practiced in Universities, they could easily learn to get used to the company's systems.

Employees had important roles in the decision-making process as well as implementation process. In many cases, their knowledge about information technology was much better than top managers, thus they could provide helpful advice for top managers in decisions to adopt an information system. Even in the case of W, internal IT employees were responsible for building the system for the company. Or in the case of T, a member of staff who had advanced knowledge in IT supervised the development and implementation of the new website for the company.

**Customers.** The literature suggested that customers could initiate information system adoption by applying pressure to the companies. There was a case in which customers' complaint were among the reasons for the adoption of an information system. However, the pressure was not clear enough. Customers' comments should be considered as one of the references for the decision making of top managers.

**Competitors.** Competitive pressure may force SMEs to adopt an IS, especially when a certain information system has shown positive results for other competitors. To some extent, that was true, as in the case of U. The inventory control system had been adopted successfully in U's competitor, thus the owner-manager of U desired to have the same system in his business.

**IS vendors/ External consultants.** IS vendors and external consultants were perceived as a necessary element of IS adoption by the companies, not only for their support but also as a source of information on the availability of IS solutions that fitted their needs. From our studying, there was only one company in which the system was developed by internal IT persons. The other companies had their systems outsourced. IS vendors may affect the decision making phase via their marketing programs, providing advice or even personal relationship.

**Government.** Government is expected to provide a good infrastructure and communication network to facilitate the process of information system adoption in businesses. In Vietnam, the electricity network is managed by EVN (Electricity Vietnam), a monopoly state-owned company. In many areas, not only in rural areas but also in municipalities like Hanoi and Ho Chi Minh City, cutting off power often happens without prior notice. That causes many problems to entrepreneurs. One of those problems could be found in the case of W.

The use of unlicensed software is quite popular in Vietnamese companies, not only SMEs. According to Business Software Alliance (Dao, 2010), Vietnam has a high rate of enterprises using pirated software. Many Vietnamese companies still think that they only need to buy licenses for existing pirated software in case they are discovered by the government. However, the punishment is much tougher than that. According to Vietnamese Criminal Law, beside penalty in money, the owner of a company using illegal software may spend up to 3 years in prison. In the case of X and Y, there was strong impact from government to the decision to adopt licensed Windows Server 2008 and OpenOffice.org.

### 7.3 Suggestions for top managers in Vietnamese SMEs

From our studying, we have some suggestions for top managers in Vietnamese SMEs in dealing with IS adoption.

Firstly, staff involvement in the adoption process is important. After all, the staff are usually the ones who have to deal with the system on a daily basis. This corresponds closely with the conventional wisdom of ‘user involvement’ in a software development project being an essential contributor to successful software products.

Secondly, selection of proper software packages to fit the business requirement is extremely important. A firm should evaluate IS using different techniques before implementation. This is particularly important for SMEs because of the lack of financial support as well as lack of IT knowledge. When and how to change are also important.

Finally, the top managers should not allow the use of pirated software under any form in the business. If cost is their main concern, they should think of Open Source software instead of purchasing a pirated software or illegal licensed software. Many open source software are well engineered being able to replace for expensive licensed software.

#### 7.4 Limitations and Future work

This thesis has two limitations. Firstly, there were only seven SMEs from the Southern of Vietnam involved in the study, thus the findings might not be appropriate for the whole Vietnam. Secondly, with cases from seven companies, our study could not be considered as truly representative of all Vietnamese SMEs. However, this thesis is considered valid and reliable. The analysis of reasons for IS adoption and factors influencing the adoption within seven Vietnamese SMEs have shown similarity with and confirm previous studies mentioned in the literature.

Our study of IS adoption process within Vietnamese SMEs has provided some basis for further studies, which may involve more participants, for example the developers from IS vendors to give a more complete picture of IS adoption phenomena within Vietnamese SMEs. Besides, we also suggest further studies on phases being in or related to IS adoption, such as initiative, decision-making, negotiation, development, implementation, and usage. Finally yet importantly, further studies may focus on the impacts of customers and competitors on IS adoption of companies.

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## APPENDICES

### APPENDIX 1

#### **Semi-structured interview guide questions**

Participant's name:

Position:

System adopted:

**Decision making:** the context that leads to the adoption of Information System

Who initiated or proposed the idea to adopt that IS for your organization?

What were the reasons for IS adoption?

What were the factors considered for IS adoption?

Who were involved in the decision making progress?

**IS Vendor Selection, Development and Implementation:** period after the decision to adopt IS has been made until the implementation of IS completed.

How the selection process of IS vendor was carried out?

Who were involved?

How was the implementation process?

What were the factors influencing the implementation process?

**Evaluation:** period after the adoption process was completed.

What were the impacts of IS adoption to your business?

Do you feel it was a success? Why?

Would you consider adopting any IS in the future?

## APPENDIX 2

THE GOVERNMENT

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SOCIALIST REPUBLIC OF VIETNAM

Independence - Freedom - Happiness

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No. 56/2009/ND-CP

Hanoi, June 30, 2009

**DECREE****ON ASSISTANCE TO THE DEVELOPMENT OF SMALL- AND MEDIUM-SIZED ENTERPRISES****THE GOVERNMENT**

*Pursuant to the December 25, 2001 Law on Organization of the Government;  
Pursuant to the Enterprise Law and the Investment Law of November 29, 2005;  
At the proposal of the Minister of Planning and Investment;*

**DECREES:****Chapter I****GENERAL PROVISIONS****Article 1.** Governing scope

This Decree provides for policies on, and the state management of assistance to the development of small- and medium-sized enterprises.

**Article 2.** Subjects of application

This Decree applies to small- and medium-sized enterprises, organizations providing assistance to the development of small- and medium-sized enterprises and agencies performing the state management of assistance to the development of small- and medium-sized enterprises.

**Article 3.** Definition of small- and medium-sized enterprises

1. Small- and medium-sized enterprises are business establishments that have registered their business according to law and are divided into three levels: very

small, small and medium according to the sizes of their total capital (equivalent to the total assets identified in an enterprise's accounting balance sheet) or the average annual number of laborers (total capital is the priority criterion), concretely as follows:

Sector	Size	Very small enterprises	Small-sized enterprises		Medium-sized enterprises	
		Number of laborers	Total capital	Number of laborers	Total capital	Number of laborers
I. Agriculture, forestry and fishery	10 persons or fewer	VND 20 billion or less	Between over 10 persons and 200 persons	Between over VND 20 billion and VND 100 billion	Between over 200 persons and 300 persons	
II. Industry and construction	10 persons or fewer	VND 20 billion or less	Between over 10 persons and 200 persons	Between over VND 20 billion and VND 100 billion	Between over 200 persons and 300 persons	
III. Trade and service	10 persons or fewer	VND 10 billion or less	Between over 10 persons and 50 persons	Between over VND 10 billion and VND 50 billion	Between over 50 persons and 100 persons	

2. Depending on the nature and objectives of each assistance policy or program, the sponsoring agencies may concretize the above criteria as appropriate.

3. The Ministry of Planning and Investment (the General Statistics Office) shall assume the prime responsibility for, and coordinate with ministries, branches and concerned agencies in, investigating, summing up and publicizing annual statistical data on small- and medium-sized enterprises according to the definitions in this Decree.

**Article 4.** Plans on assistance to the development of small- and medium-sized enterprises, which cover the solutions and funds for implementation, must be incorporated into annual and five-year plans of ministries, branches, localities and the national economy.

#### **Article 5.** Assistance programs

1. The State's programs on assistance to small- and medium-sized enterprises (called assistance programs for short) means the target programs reserved for

small- and medium-sized enterprises, which are formulated on the basis of orientations for socio-economic development, branch and local development and are included in annual and five-year plans. Priority will be given to programs on assistance to small- and medium-sized enterprises owned by women and small- and medium-sized enterprises employing a larger number of female laborers.

2. Before being submitted to competent authorities for approval, programs on assistance to small- and medium-sized enterprises must be commented by the central state management agency for assistance to the development of small- and medium-sized enterprises, defined in Article 15 of this Decree, with a view to ensuring consistency and integration with other state programs on assistance to small- and medium-sized enterprises.

3. Ministries, branches and localities formulate, and organize the implementation of, assistance programs in the domains or localities under their respective management. The Ministry of Planning and Investment shall act as the key body summing up reports on the implementation of assistance programs and on matters to be settled, for submission to the Prime Minister.

4. Depending on the nature and scope of each assistance program, state-run non-business organizations and capable service providers may participate in the implementation of programs via bidding as prescribed by law.

**Article 6.** Promulgation of regulations related to small- and medium-sized enterprises

Agencies taking charge of drafting legal documents related to small- and medium-sized enterprises shall coordinate with the central state management agency for assistance to the development of small- and medium-sized enterprises, defined in Article 15 of this Decree, in order to ensure that those legal documents will facilitate the development of small- and medium-sized enterprises.

## **Chapter II**

### **ASSISTANCE POLICIES**

*(Omitted)*

## **Chapter III**

### **STATE MANAGEMENT OF ASSISTANCE TO DEVELOPMENT OF SMALL- AND MEDIUM-SIZED ENTERPRISES**

*(Omitted)*

**Chapter IV****IMPLEMENTATION PROVISIONS**

*(Omitted)*

**ON BEHALF OF THE  
GOVERNMENT  
PRIME MINISTER**

(Signed and Stamped)

**Nguyen Tan Dung**