Using the Technology Acceptance model to investigate knowledge conversion in Thai public organisations

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Declaration

"I, [Puripat charnkit], declare that the DBA thesis entitled [Using the Technology Acceptance model to investigate knowledge conversion in Thai public organisations] is no more than 65,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work".

Signature.....Date.....

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Abstract

This dissertation investigated the relationship between knowledge conversion processes using the Technology Acceptance Model (TAM) in Thai governmental organisations. There are few studies concerned with the development of sharing and the conversion of knowledge, and none of the Thai public sector. Most Thai research studies are concerned with the development of knowledge management practices and how to use created knowledge in organisations. This study used the relationship between technology support and managing the conversion of knowledge to increase knowledge sharing in organisations. It also contributes to knowledge of technology usage and the conversion of existing knowledge process by applying the Technology Acceptance Model (TAM) to explain uptake and use of this technology. The main benefit of this research is that it is the first study available to the Thai Government on the issue of developing knowledge conversion processes by applying the Technology Acceptance Model. A better knowledge conversion procedure can improve the efficiency of Thai government departments.

The aim of this thesis was to explore the knowledge conversion process in Thai public organisations, identify the external variables that affect the Technology Acceptance Model, and determine ways to enhance knowledge sharing in Thai public organisations. Moreover, the problems and barriers that are inhibitors to knowledge conversion processes in Thai public organisations were investigated.

In an attempt to accomplish this aim, the thesis includes a focused literature review of areas such as knowledge management (KM), the knowledge conversion (SECI) process, knowledge sharing, technology and communication support, and the Technology Acceptance Model.

In addition, it adopts a qualitative method including semi-structured interviews with ten interviewees from the ICT team and KM team in the Ministry of Commerce, Thailand. Transcription of the interviews and data coding were carried out by the researcher for the purpose of qualitative analysis.

The qualitative findings demonstrated that there were eight external variables that affect TAM and knowledge conversion processes in the sample:

(1) Age , ability, educational background, and skill

(2) Training strategies and training period

(3) Techniques and tools to persuade people

(4) Knowledge person (knowledge worker and knowledge receiver)

(5) National background and Thai organisational culture (organisational culture with learning ability, organisational culture with expression ability, organisational culture with achievement, and organisational culture with old practices)

(6) Attitudes, understanding, and behaviour of the employee

(7) Management and policies; knowledge management program; fluctuations in management positions; motivation and attention from head office

(8) Amount of computer and IT support, including support in the workplace, support for knowledge management programs, support for the policies and plans of the organisation, and security issues.

The results and discussion of this study are important for Thai public organisations because they contribute new knowledge in areas of knowledge conversion and technology support to improve organisational performance and reveal the key problems concerning knowledge management implementation in Thai public organisations.

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List of Abbreviations

ICT	Information and Communication Technology
IS	Information System
IT	Information Technology
KC	Knowledge Conversion
KM	Knowledge Management
KS	Knowledge Sharing
MOC	Ministry of Commerce
OPDC	Office of the Public Sector Development Commission
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SECI	Socialisation, Externalisation, Combination, Internalisation
TAM	Technology Acceptance Model

1. INTRODUCTION

1.1 Introduction

Human resource and organisational development are essential for helping organisations achieve the highest efficiency. Using tools, strategies and efficient methods, many organisations are attempting to revamp their old management styles to enhance their ability and be on par or be competitive with other organisations in a similar structure or business. Nowadays, there are many capability tools that can be used by an organisation. For example, Information and Communication Technology (ICT) can serve as a management tool and boost an organisation's potential, irrespective of the industry or sector. ICT has a multi-faceted role and can be easily integrated with the strategic plans of the organisation.

Public and private sector companies in Thailand employ ICT in their organisations, for developing web pages, websites and e-learning content, to enhance their staff's potential and knowledge. TMB Bank, for example, is a private sector financial institution in Thailand. Their use of ICT is evident on their website and in their e-learning modules, developed to strengthen the skill set of their staff.

Many public sector or government organisations have realized the uses and benefits of ICT. The Thai government, in particular, is keen on utilizing ICT to improve people's potential in the country and the abilities of the officers in the agency. In 2002, the Thai government acknowledged the benefits and importance of knowledge management after they learned that knowledge management can help them to improve the old Thai public governance system by resolving concerns related to employees' organisational learning.

Therefore, they introduced Knowledge Management (KM) as part of the government's development strategy (2003-2004) (McKenzie 2005; OPDC 2004). The main objective of this plan was to modify processes and working procedures so as to raise the competency and working standards of Thai government service units to the international level by using good governance practices. The objective of good governance is ensuring the common benefit of people and accomplishing the government's mission of efficiency. It also

involves leveraging cost benefits by reducing redundant operational processes and offering end-to-end solutions to make people's lives more convenient and comfortable—helping them receive everything that they need, including performance evaluation, instantly. The background of knowledge management in Thai agencies and public sector development strategic plans is discussed in the next section.

Many countries consider KM to be very important and useful for retail organisations. It is employed by global organisations such as Xerox and IBM for consolidating and sharing knowledge with employees. They also use KM to manage their organisation as well. Moreover, many government sectors in several countries also use KM strategies to manage their valuable resources and improve and increase their public sector ability. Examples of such countries are Thailand, Australia and Korea (Chowdhury 2006; OPDC 2004; Ritter & Choi 2000; Samarah 2006; Slagter 2007). By reviewing studies and existing literature, the author argues that ICT can be used for knowledge management capabilities.

Modern technology that supports knowledge management depends on the following:

1. Type of knowledge that needs to be consolidated and stored.
2. Type of people in the organisation.
3. Components and technological framework in the organisation.

In Thailand, the government sector is very interested in KM and its uses within the organisation. However, in terms of execution Thailand lags behind other developed countries as the processes for knowledge management are currently being researched.

This research aimed to investigate the use of ICT (Information and Communication Technology) in the process of knowledge conversion in a Thai public organisation. It was based on the Technology Acceptance Model (TAM) (Davis 1989).

1.2 Aims of the Research

The aim of this research was to study the relationship between knowledge conversion processes and technology acceptance in Thai government organisations.

In particularly, the study aimed to

1. Identify the external variables that have an affect on technology acceptance in organisations.
2. Survey technology usage related to knowledge conversion processes in a Thai public organisation.
3. Identify the main problems inhibiting the use of technology to convert knowledge in a Thai public organisation.
4. Determine ways to enhance knowledge sharing in a Thai public organisation.
5. Find out details of barriers to knowledge conversion processes to reduce these barriers in Thai public organisations by using information and communication technology and external variables.
6. Provide information of knowledge conversion that will help to increase the performance of knowledge conversion in Thai public organisations.

1.3 Definition of Terms

The definition of terms are fully explained later in this thesis, but brief definitions are given here.

- Technology Acceptance Model (TAM): TAM was developed to predict individual adoption and use of new technologies (Davis 1989).

- Information and Communication Technology (ICT): ICT is defined as a technology in a user's world such as telecommunications networks, Internet, and any associated machinery or equipment (Hendriks 2001; Kling 2000).

- Knowledge management (KM): is often defined in several ways. For example Brelade and Harman (2001) consider that "Knowledge management is the acquisition and use of resources to create an environment in which information is accessible to individuals and in which individuals acquire, share and use that information to develop their own knowledge and are encouraged and enabled to apply their knowledge for the benefit of the organisation."

  Knowledge management is described as an innovation with the potential to affect the whole of an organisation's business, especially its processes and information systems (De Grooijer 2000).

- Knowledge conversion (KC): The knowledge conversion process is a critical interaction where human knowledge is created and expanded through social interaction between tacit knowledge and explicit knowledge. This model consists of four different modes of knowledge conversion (Socialisation, Externalisation, Internalisation and Combination - SECI) (Nonaka and Takeuchi 1995).

1.4 Contribution to Knowledge

Most previous studies in this area have focused on the influence of the technological perspective of knowledge management programs and awareness of organisational practices related to knowledge management (KM) processes in developed countries (Chauvel & Despres 2002; Davenport & Prusak 1998; Thall 2005; Vorakulpipat & Rezgui 2006; Zyngier 2003).

The development of a knowledge conversion model (KC) and knowledge sharing process by using appropriate technologies in the public sector, however, has not been well studied. This study aims to contribute to knowledge by developing such a model to promote good transformation of knowledge to create the greatest value in Thai public organisations.

The study also contribute to knowledge of technology usage and the conversion of existing knowledge processes by applying the Technology Acceptance Model (TAM) (Davis 1989) to explain uptake and use of this technology. The study investigated the external variables which impact on efficient sharing and conversion of knowledge by humans and organisational communications in the Thai public sector.

The two main approaches to investigate adoptions and use of ICT are innovative diffusion and the Technology Acceptance Model (TAM). TAM was chosen for this study because the concept of Perceived usefulness and Perceived ease of use appeared to be more appropriate to investigate knowledge conversion (KC) in the Thai government. To enhance a performance of knowledge conversion in modern organisations, technologies are used in any section of the knowledge conversion process.

Therefore, TAM is used to analyse four types of knowledge conversion processes: Socialisation, Externalisation, Combination, and Internalisation (SECI).

The study use two approaches: firstly to demonstrate technological infrastructure used to increase conversion knowledge processes efficiently in the Thai public sector, and secondly, after using a TAM analysis, to provide knowledge about the way knowledge sharing could best be implemented in organisations.

1.5 Context of the Project

In the 1990s Knowledge Management (KM) was adopted in many Asian countries including Japan, Singapore, Hong Kong and India. These countries were greatly concerned

with creating knowledge and an understanding of knowledge management in human resources, as people's involvement is the key to any KM success to aid developing countries (Chowdhury 2006; Hyun-Soo & Yung-Ho 2003; Nair 2005; NUS 2007; O'Leary & Selfridge 2000). In Thailand in 2004 the government set up the Office of Knowledge Management and Development (OKMD) under the Prime Minister's Office. This organisation constitutes the Centre of Knowledge in Thailand.

Several studies have shown that companies believe that managing knowledge in organisations can increase competitive advantage (Civi 2000; Davenport & Prusak 1998; Morrissey 2006) and is the key to success is human knowledge in organisations (Awad & Ghaziri 2004; Dalkir 2005; Fernandez, Gonzalez & Sabherwal 2004; Figallo & Rhine 2002; Heisig, Vorbeck & Mertins 2003; Hislop 2005; Milton 2005; O'Leary & Selfridge 2000). Therefore, to increase knowledge and competitive advantage in organisations, the Thai government has considered knowledge management strategies for the development of the Thai Public Sector (2003-2007).

There are, however, few studies concerned with the development of sharing and conversion of knowledge, and none in the Thai public sector. Most Thai research studies are general and are about development of knowledge management practices and how to use created knowledge in organisations (Igel & Numprasertchai 2004; Janpen, palaprom & horadal 2005; Nair 2005; NUS 2007; O'Leary & Selfridge 2000; Vorakulpipat & Rezgui 2006). Many strategies, however, have been presented to support the knowledge management process. Knowledge sharing is an important issue as this strategy can effectively improve knowledge management processes in organisations (Huysman 2002). This study uses the relationship between technology support and managing the conversion of knowledge to increase knowledge sharing in organisations.

Information and communication technology (ICT) provides a new strategy for modern organisations that use these technologies to enhance their abilities (Beynon-Davies 2004). In the knowledge sharing process, there are some barriers or limitations. An ICT strategy might be used to solve these problems within an organisation's knowledge sharing process by reducing barriers to knowledge transfer, reducing barriers of space and time and decreasing social barriers (Huysman 2002; Marshall 1997; McGrath & Hollingshead 1994; Ruggles 1997).

1.6 Statement of Significance

The main benefit of this research will be that it is the first study available to the Thai Government on the issue of developing knowledge conversion processes by applying the Technology Acceptance Model (Davis, F. D., Bagazzi & Warshaw 1989) in the public sector.

The study will improve the knowledge conversion process in the public sector and prepare for Electronic-government usage by the Thai government in 2010. This study is concerned with new strategies and methods involving information and communication technology (ICT) and knowledge conversion, by focusing on the benefits of ICT and attitudes of users to technology that make it possible to increase effective knowledge conversion. Moreover, the Thai government may use the results of this research to work with their knowledge management programs in each organisation. By studying the Technology Acceptance Model and the knowledge conversion process, the Thai government should be able to clearly understand the methodology and usefulness of the conversion process between tacit knowledge (employees and people) and explicit knowledge (databases, website etc.).

In addition, the Thai people will receive the benefit of a new public knowledge management process providing fast information, ease of information access and better public organisational service. In terms of economic and social growth, the abilities of Thai public officers will be increased when the Thai government has a good understanding of the foundations of knowledge and technology usage in organisations. It should also contribute

to the national economy. Developed countries such as Japan and the USA have already launched knowledge management programs in both the public and private sectors and have used their human resource experiences to become leaders of the economic world. In the Thai style of workplace, the result of this study should aid in changing the attitude of co-workers and managers to the use of this technology (i.e. attitude of use of technology and expression of employee's opinion).

1.7 Conceptual Framework

TAM proposes that acceptance or usage is determined by two factors: Perceived Usefulness and Perceived Ease of Use. Davis (1989) defined perceived usefulness (PU) as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived Ease of Use (PEOU) is defined as the degree to which a person believes that using a particular technology would be free from effort.

The conceptual framework of this research illustrates the value of TAM's PU and PEOU to explain the increased effectiveness of the knowledge conversion process. In order to accomplish the aim of this research, four research questions needed to be investigated:

1. Which external variables have an impact on technology acceptance in Thai public organisations by improving or reducing the knowledge conversion processes?

2. Which technologies have been used with knowledge conversion processes (SECI) in Thai public organisations?

3. Does the sharing of knowledge in Thai public organisations increase after improvements in the knowledge conversion process?

4. Does the Technology Acceptance Model help explain the knowledge conversion process in Thai public organisations?

The relationships in the conceptual framework are described below.

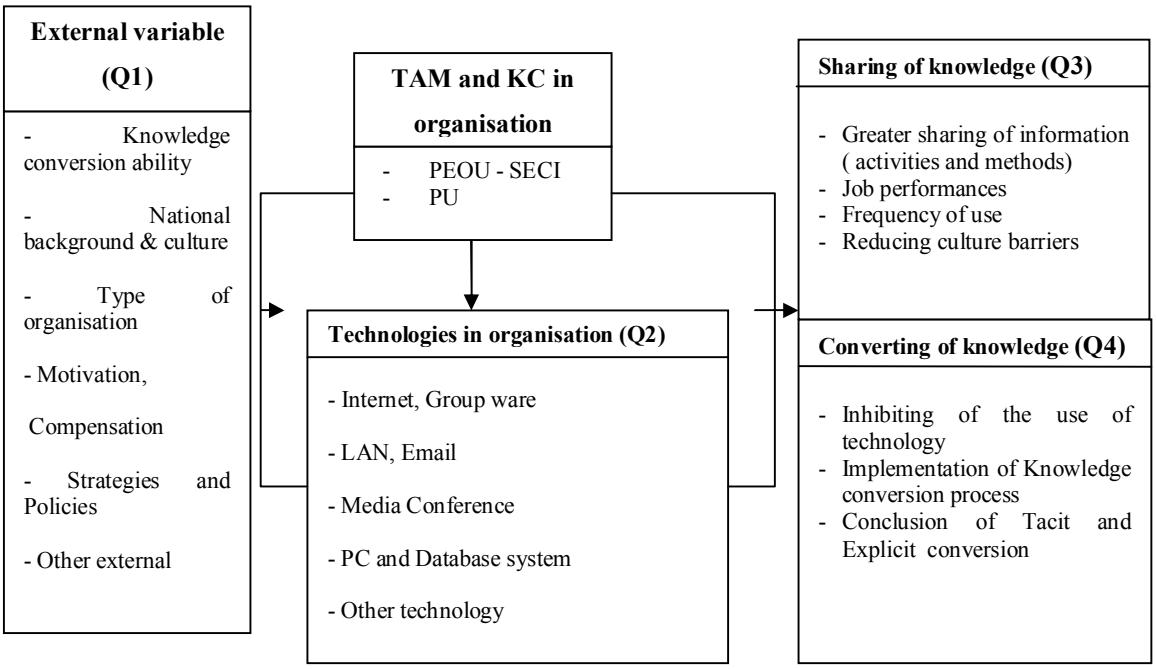

Figure 1-1 Conceptual Framework (final version) of Thai public knowledge conversion enhancement.

Object 1: External variables

This describes some external variables during and/or after interview. It may include existing and undiscovered variables. These external variables demonstrate the relationship between the Technology Acceptance Model (PU and PEOU) and the method of converting knowledge (SECI). For example, National background and culture may influence Perceived Ease of Use of technology like the Internet and groupware in relation to a process of socialisation.

Object 2: TAM and KC in organisations

This object considers the link between technologies provided in the organisation, the Technology Acceptance Model (TAM) and process of SECI of knowledge conversion (KC).

Object 3: Technology in organisations

This finds out what technologies have been used with people and processes of transfer/convert/sharing knowledge and information in the organisation.

Object 4: Sharing of knowledge and Converting of knowledge

These show the outcomes of this study after considering the relationship of TAM and SECI by indicating the impact of external variables on both relationships.

1.8 Methodology

Yin (1994) argues that the single case design is eminently justifiable under certain conditions and that three key situations for choosing a single case study consist of a critical case, extreme case and revelatory case. This research uses case study methodology to investigate how Thai public organisations improve the sharing of knowledge, by using the Technology Acceptance Model to explain development of the knowledge conversion process. A case study approach is used because the concepts under study are still undiscovered. This case study includes a collection of documents such as reports, manuals, policies etc. It uses methods of qualitative research to examine, describe and analyse the characteristics of public sector employees in the Ministries of Commerce and IT (Blumer 1956; Cicourel 1964; Silverman 2000). Also, this study uses the interview method with a sample group to answer the research questions. The questions related to three main areas. Firstly, the general technology usage was questioned to understand what technology is used in the organisation and what people use these technologies for (Q4 above). Secondly, problems and other variables which impact on expressive knowledge/information by

indicating the relationship between employees in the organisation who have been interviewed (Q1 above).

Finally, methods of creating knowledge and storing information were to learn of the organisational culture of sharing knowledge and the procedure of converting knowledge (Q2-3 above).

The interview schedule was designed to obtain different types of information from the sample group, including perceptions, behaviours and motivations. The list of questions was developed in English and then translated to Thai. Analysis of data and results of data collection were translated from Thai back into English. This presented no problems as I understand both languages.

It is acknowledged that it is not possible to generalise from single case studies, but it is hoped that the study will reveal useful information on the issues involved.

1.9 Sampling

The sample group in this research focuses on the Knowledge Management and ICT departments in a Thai Ministry (Ministry of Commerce, Ministry of ICT). This study selected groups of managers/directors and colleagues who work closely on a knowledge management team and on information technology design. It can be said that this sampling is done because they are the main actors that use technologies and create knowledge management strategies in the sector. The total number of participants was 10 people; 3 people from the manager and senior officer groups and 7 people from colleagues groups. This is not intended to be a representative sample, but to provide some information about how these key people see the use of this technology. It was expected that interviews would each be approximately 30 minutes in duration.

1.10 Data collection and Data Analysis

Before collecting data, interview questions were approved by the research ethics committee. Data for this study was collected by conducting semi-structured interviews. These were recorded (with the interviewee's permission) and transcribed.

Semi structured-interviews were used with head managers who are in teams for knowledge management and ICT. Focus group interviews were used with employees and senior employees.

To provide reliable data, this research used tools including a tape recorder, electronic mail and video recorder with respondents.

This study used content analysis. Data is processed by multiple methods including transcripts, notes, etc. The data is displayed in the form of intermediate representation, for example graphical models, collections of themes and written descriptions. According to Lincoln and Guba (1984), the basic analysis procedure is unitization and categorization. This research identified the meaningful section of text by reading through the data, several times. Therefore, the method of analysis can be described as using the frequencies of most used keywords in the content.

1.11 The background of knowledge management in Thai agencies and governance policy support

1.11.1 The implementation of knowledge management initiatives in Thailand

One of the main concerns of the Thai government is the development of Thailand's bureaucratic system. For more than a decade, very few attempts have been made to study or strategically analyse implementation programs aimed to enhance employees' ability and increase the capability of public services. Thailand's development has lacked coherence

and continuity at a policy level. There are some limitations that prevent Thailand from being on par with other international public organisations. For example, the lack of responsible task owners or mechanisms to drive implementation efforts has prevented the bureaucratic system from being significantly changed (OPDC 2006).

Factors limiting the development of Thailand's bureaucratic system are:

- Dwindling capabilities
- Overlapping between training and usage
- Lack of integration
- Delay
- Inefficiency and ineffectiveness
- Structural problems
- Inappropriate roles and size of the public sector and
- Widespread corruption.

Owing to the above problems, the implementation of Thailand's bureaucratic reforms began in early 2002 and was amended in the middle of 2002. The reforms simultaneously targeted a complete overhaul of the administrative processes and the structure of the public sector.

Then, the State Administration Act, Amendment Issue 5 B.E. 2545(2002) was passed to reflect the changes in values, paradigms and working culture of the public sector. Good governance principles were emphasised, and the Royal Decree on Criteria and Procedures for Good Governance was enacted in 2003 (OPDC 2006).

The Royal Decree on Criteria and Procedures for Good Governance B.E.2546 is emphasised in section 11

> "*The government agency, for result-based management under this Royal Decree, shall make itself to be global learning organisation. For this purpose, the government agency shall acknowledge and analyse information in all aspect and shall then apply analytical result to its administration for correct, quick, and suitable service. The government agency shall also promote and develop capability, vision, attitude and co-learning of its official*."(Thailaws)(Translation)

Moreover, the Royal Decree on Principles and Procedures for Good Public Governance B.E.2546, (section 11) clearly addressed the development of a knowledge- based agency:

> "*In order to enable the administration of the government agency to be in compliance with the public administration for the efficient result of the mission of the State, the government agency shall have the duty to develop knowledge base within its agency regularly so as to make itself as the knowledge base agency. In this regards, the government agency shall analyse all received information in order to produce analytical knowledge which is necessary to its practical use in its public administration correctly, rapidly and suitably for any circumstance. The government agency shall also promote and develop knowledge and capability of, and create vision and alter attitude of, its public servants so as to be efficient and co-learning personnel*."(Thailaws)(Translation)

Thus, the royal decrees prompted the public sector in Thailand to transform itself into a learning organisation and a knowledge-based agency.

1.11.2 Strategic development plans of the Thai public sector

To achieve the objectives of Thailand's bureaucratic reforms and garner general support for good governance policies, the Thai government established the Office of the Public Sector Development Commission (OPDC), which offers support to the new management of all Thai agencies. The desire to act in accordance with the intent of Section 11 of the State Administration Act law and the Royal Decree on Criteria and Procedures for Good Governance directly impacted many agencies because they sincerely strived to achieve these goals. OPDC was a centred public administration unit that developed processes for solving problems during the transition period of the bureaucratic reforms. For solving problems, the OPDC developed the Strategic plan for Thai Public Sector Development of 2003-2007 , which was approved on 19 May 2003 (OPDC 2004). This plan focused on four key target areas: 1) developing better service quality, 2) revision of roles, missions, and improved right sizing, 3) leveraging capabilities, and 4) standard of performance. Knowledge management has been employed to achieve the target of leveraging capabilities. KM can be used to strengthen the capabilities of government agencies and promote efficiency and effectiveness in the Thai public administration (OPDC 2006).

1.11.3 Pilot agencies

After promoting knowledge management in 2004, the government focused on providing training to individuals for undertaking pilot projects for the Ministry and other provinces. More than 2600 executives were trained to serve as management consultants. Plans for knowledge management were drafted as part of the learning innovation for government agencies and provinces to build a public service system of an international standard. Thirty-six departments under 4 ministries were part of the pilot project (OPDC 2006).

A pilot project was undertaken to Thai ministries which have chosen to conduct a new KM strategy in organisations. The MOC was one of the pilot agencies studied in this research. The group of pilot agencies had to present their strategic plans, cluster management plans

and performance agreements including key performance indicators (KPI) for the clusters, to the OPDC (OPDC 2004).

In 2005, the OPDC identified two pilot agencies: 1) Department of Internal Trade (DIT) under MOC and 2) Department of Mental Health under Ministry of Public Health. Both pilot agencies were asked to incorporate the Thai public sector development strategic plan into their organisation and to present the public sector development annual report to the OPDC (OPDC 2004). The OPDC's goal was improvement of public management quality. To realize this goal, more than half the governmental agencies have to achieve an acceptable standard of public management quality, and OPDC, in turn, will nominate them the Public Sector Management Quality Award (PMQA) (OPDC 2004).

In summary, every government agency is expected to improve its processes to ensure that adequate competency shows in the new public management reforms. Knowledge management has been recognised and implemented as an important strategy for recovery of Thailand's bureaucratic system. MOC was identified as a pilot agency to adopt knowledge management for improving its competencies and for learning new strategies that increase quality, efficiency, effectiveness, and organisational development.

1.11.4 Background of Ministry of Commerce

Background information of the MOC has been described below to give the reader a good understanding of the objectives of the MOC organisation, a preview of the MOC department chart, and implementation of knowledge management in MOC.

1) Responsibilities

The Ministry of Commerce has authority and responsibilities regarding trade in goods and services, intellectual property rights and other duties as assigned by laws.

2) Vision

To be the leading Ministry in driving both domestic and international trade and the economic system to achieve continuous and sustainable growth for a better living standard of all Thai people.

3) Mission

1. To increase national income.
2. To strengthen internal trade and the economic system.
3. To strengthen and protect consumer's interests.

4) Goals

1. To sustainably expand international trade.
2. To generate higher income among the agriculture workforce.
3. To strengthen competitiveness of entrepreneurs, SMEs and community businesses.
4. To ensure fairness and protect consumer's interests.
5. To provide best services for all citizens.

5) Main Strategies

1. Agricultural Price Management.
2. Enterprise Development.
3. Value Creation.
4. Trade/Business Logistics.
5. Internationalization.
6. Consumer Protection.

7. Good Governance.

6) Agencies within the Ministry of Commerce (MOC) include two main Offices and six Departments:

1. Office of the Minister (OTM).
2. Office of the Permanent Secretary (OPS).
3. Department of Foreign Trade (DFT).
4. Department of Internal Trade (DIT).
5. Department of Trade Negotiations (DTN).
6. Department of Intellectual Property (DIP).
7. Department of Business Development (DBD).
8. Department of Export Promotion (DEP).

1.11.5 Role of the Office of the Permanent Secretary (OPS)

The OPS is the Main office of the MOC. They plan economic strategies for the nation and find suitable solutions to sustain organisations. For example: the development of administration in MOC using five strategies:

1. Using ICT to develop Trade intelligence.
2. Increasing capability of e-business for competitive advantage by using a Cyber - Mall Idea.
3. Developing an ICT system to support E-government processes.
4. Developing E-service to increase service performance for the Thai people.
5. Developing an Information and Communication Technology base.

OPS use ICT and KM to support MOC's main strategies. To improve strategies, the application development by the ICT team was designed to create a highest performance by:

1. Finding suitable software to support staff and working processes.
2. Database software: to store new knowledge that is helpful to develop the organisations.
3. Filtering software: to filter spam that obstructs knowledge management processes in organisations.
4. Antivirus software: to protect data and knowledge assets.
5. Knowledge management software: to manage existing knowledge and information.

1.11.6 Support of knowledge management in the Ministry of Commerce

There are 4 strategies that bring the best advantages of knowledge management to the MOC. These supports below give a key outline to enhance the people knowledge of the MOC and consist of:

1. Knowledge Creation
2. Knowledge Utilisation
3. Application Development
4. Human resource development.

Moreover, human resource development of the MOC is taken and worked as seriously as knowledge management implementation. MOC promotes a self- learning system by using electronic communication such as E-learning to support the development of the human resource in the organisation. This includes training and useful programs that are generally operated in the work place.

The knowledge management support in the MOC is shown in the ICT Master plan for 2008-2011. It consists of:

1. E-Document system: To store important documents that relate to Job descriptions, Rules, Policies and Law.

2. E-Learning System: Staff and people can learn and choose the programs that they intend to learn. This system has been created to develop MOC's staff and people knowledge.

3. E-Library: To store general documents and technical matter.

4. Knowledge database system.

5. Data warehouse: To collect all important documents that relate to agricultural data and agricultural products transformed including local and international information.

6. Preparing useful software: To collect and analyse internal data in a data warehouse.

In addition, the MOC service system has been developed to support any services in the MOC including:

1. One-stop service: linking all services as a network between department and department.
2. Distribution of information in the Ministry of Commerce.
3. To be a Web portal for linking websites in MOC's departments and branches including public and private organisations in Thailand.

The computer software in MOC is service system is integrated:

1. Web server: including five features HTTP 1.1, SSL, Basic Authentication, Cookies Support and CGI.
2. FTP server.

3. Sync Server.

4. Mediation server.

The table below summarises the MOC's technologies including technology and communication provided, and Knowledge management activity.

Table 1-1Summary of MOC's technologies, communications and knowledge management activities

Technologies	Communication	Knowledge management activity
MOC service - Web server - FTP server - Sync server - Mediation server	- Intranet, Internet, - Internal mail service, - MSN Messenger - VDO Conference - Phone and cell phone -Web mail, Web site, Web board -Black office system via intranet system	Storytelling activity Learning in a community of practice (COP)
E-Service E-Document, E-Learning, E-Library, Knowledge database system, Data warehouse		
Software Application development Database software Filtering software		

Antivirus software Knowledge management software		

1.12 The development of an IT project in Thailand

The development of an IT project in the Thai public sector was initiated in the early 1990s. However, the National ICT master plan was not developed then. Thailand has experienced many problems in using IT in the public sector. The Thai government has decided that they should develop a national IT master plan to deal with problems such as e-governance or e-government strategies. An e-government strategy can encourage each public sector unit to improve and develop its own IT system. From a centralized control, the government can act as the centre, developing the IT project for each Thai public sector. This project has been launched to increase efficiency and effectiveness of government services and for the benefit of people who have to contact or coordinate with any of the public sectors. Although, the government will play a central role in developing this project, each public sector unit is also expected to contribute to the development of its own IT projects. However, involvement of individual units in developing their own IT infrastructure leads to problems such as "*different types of legacy systems, different types of data standards, inability to directly exchange data because of differences in data formats, data duplication with other existing database system, and repetitive efforts in software development*" (Varavithya & Esichaikul 2003). Thailand has adopted a combined approach of strategic distribution and centralization in the past. Other countries can adopt a similar approach to avoid failure and successfully implement e-governance. Thereafter, the government monitored this project and attempted to utilize a strategic centralized approach, especially for building national data networks and software applications, to reduce IT-related expenses in the public sector. Therefore, the IT unit has played an active role in this strategic.

However, the Thai government recognises that the master plan is not yet complete. Therefore, they prepared IT 2010 – National IT Policy: 2001-2010. Apart from serving as a road map, this policy reiterates the government's stand as in March 2002 that IT policy aims to use IT for the social and economic development of the country. It is a three-pronged plan that involves "building human capital, strengthening information infrastructure and industry and promoting innovation" (Progress report of Thailand 2002). Moreover, five main flagships have been identified under this policy, namely, e-government, e-Commerce, e-industry, e-Education and e-Society. Each flagship is very important for helping the government develop the IT project. Strategies have been included in the ICT Master plan to enhance the potential of social infrastructure to ensure future competitiveness, to deploy ICT for administrative and service purposes and also for e-government procurement. The use of ICT for improvement of quality of life is also being investigated by the Ministry of Information and Communication Technology.

E-governance helps reduce the time spent by people in contacting the government sector units. It is also beneficial for the government staff. For example, the Revenue Department can provide e-revenue services by allowing people or customers to pay income tax via the Internet. This is a good way to save time and paper as customers do not have to fill a tax form and bring it to the revenue department. This system can also help customers check and calculate their income tax before submitting it to the revenue department. However, e-governance may not be suitable for some departments such as the Department of Insurance because customers often need to talk to the insurance agent before buying the insurance. Further, insurance policies are sometimes complex and require explanation as they cannot be understood just by reading online. Some types of insurance also require property inspection or a medical examination of the applicant. This is a most important distribution channel for insurance products in this country. However, the Thai government has another project for e-governance, i.e., public procurement. The Office of the Prime Minister attempts to use this project to reduce cost, improve effectiveness of public procurement, raise transparency in government dealings, and provide businesses with better access to government markets. Moreover, they also intend to use e-government as a channel for

people to contact the government directly, for receiving information or news from government.

1.13 Outline of the thesis

This section provides an overall structure of the thesis and also provides an abstract of each chapter. The structure of this thesis consists of five parts as follows:

Chapter 1 – Introduction

This part of the thesis begins with background and essence of this study. Furthermore, it suggests matters and motives that finally became an inspiration to do the research on applying the knowledge management and ICT (TAM) to the Thai organisations. Other than that, this part also contains the benefit and expectation on what will be gained from studying this topic, including the benefit for government organisations.

Chapter 2 – Literature Review

This chapter is the review on literature used in this study. It introduces background, definition and information obtained from researching, which contained information divided into 6 topics, as follows:

1. Knowledge Management (KM)
2. Knowledge Conversion
3. Type of Knowledge
4. Benefit of ICT
5. TAM Theory
6. Problems and Solutions on Knowledge Management.

This information, used in this thesis, has been obtained from researchers and from the literature, especially from research on public and private organisations.

Chapter 3- Methodology

This part introduces the procedures used in this thesis which uses a qualitative research method. It states how sampling was done and data was collected; questions of the thesis, and the processes went through to achieve the conclusion of the thesis. Moreover, it also describes the reliability and validity instruments, limitations and hypothesis of this study, and ethical issues concerning research question.

Chapter 4 – Data Analysis and Results of the study

As already mentioned in chapter 3, this thesis uses qualitative techniques to study samplings collected from Thai government organisation (MOC). This chapter describes the results obtained from using this type of research technique. Interview was most used in this study. Lots of information was obtained from interviewing which provided in the form of tables and essays. The end of this chapter provides a discussion of applying the qualitative techniques on the results from this study.

For data analysis, there are lots of topics that have been brought up to consider such as knowledge management, knowledge conversion, benefit of ICT and opinions on the use of technology relating to knowledge management, and also relevant research and literature.

Chapter 5- Discussion

After analysing the data, this chapter introduces problems that occurred from doing this study and also groups of results obtained from the research questions. Moreover it provides recommendations on the scope of the research, knowledge management, knowledge conversion, and acceptation of technology concerning knowledge management in an organisation. The final part of this chapter describes the possibility of future research that might be interesting for a researcher working in the same area, to do further research in the future.

Chapter 6- Conclusion

The conclusion restates what the thesis has studied and investigated. It provides a conclusion to this research and includes a practical discussion on the implications of the research, limitations of the research, suggestions for future research, and recommendations.

1.14 Summary

Chapter one provided information on the background which relates to the Thai public sector and knowledge management. It also pointed out the aim of the research as well as the research questions. Moreover, this chapter described the contribution and significance in extending knowledge management development in the public sector in Thailand. The key case study is explained in detail. In the next chapter, the matter of related research in knowledge management and Technology Acceptance Model are critically described.

2. REVIEW OF LITERATURE

2.1 Introduction

Chapter One explains the main objectives of the research and its contribution to the study of knowledge management and the Technology Acceptance Model study. Chapter Two presents background information and an overview of knowledge management. It also evaluates the use of information and communication technologies in contemporary organisations, while presenting a theoretical background of SECI and the Technology Acceptance Model, and discusses the role of knowledge management in public organisations, the importance of e-governance, the implementation of knowledge management and the barriers to the adoption of technology. This chapter introduces the culture and policies along with relevant sources of technology adoption in Thailand.

2.2 The Importance of Knowledge and Sharing Information

> *"Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms."* (Davenport & Prusak 1998)

In a dynamic and complex global market, success in business necessitates co-operation among various players. This can help businesses grow and sustain themselves. Relationships in a network become more flexible if they are associated with trust and based on mutual benefits (Lipnack & Stamps 2000). There are many factors that offer businesses a competitive edge. The most critical however, is knowledge-sharing within the

organisation. Knowledge is an important asset of global businesses. Amin and Thrift (1994) suggest a characteristic factor of an extending and deepening global economy is the increasing importance assigned to knowledge. It can be argued that knowledge is the economic resource in a new economy (Carlsson 2003). As is well known, knowledge is critical to every business, and knowledge management is one domain that organisations should focus on. This is because the success of business organisations in the future is dependent on creating knowledge and enhancing the ability to learn (Birchall & Tovstiga 1999).

In the organisational network, knowledge-sharing is one strategy that can help companies gain competitive advantage. Some literature reports that organisations try to enter into collaborative partnerships to buy knowledge and extend the company's capabilities or build intellectual capital (McKenzie 2005).

However, knowledge can be managed within an organisation or network by using several tools such as: the Knowledge Management Process and implementing Information and Communication Technology (ICT) to support the organisation. This thesis aimed to study the characteristics of knowledge and the various procedures of sharing, converting and using knowledge and information in organisations.

2.3 Nature of knowledge

In the relevant literature, Polanyi (1958) is the first discoverer who makes a distinction between tacit and explicit knowledge. The Polanyi's explanation of distinctive knowledge can be presented at this way:

> *"A person knows more than he can express in words. For example, A painter cannot describe in detail how he goes about drafting a new picture. This category explores the development of knowledge as well as knowledge transfer relative to the interaction of explicit and tacit knowledge*"(Krogh, Kleine & Roos 1998)

By the critical thinking of Polanyi, Nonaka and Takeuchi (1995) the above mentioned words can be used to explain the development of knowledge and interaction between these two knowledge forms.

Knowledge is considered intellectual capital and can be used thus in organisations. Negativearacco (1991)and Hamel (1991) reported that there were different types of knowledge. Hamel (1991) claimed that there were two types of knowledge: explicit knowledge and tacit knowledge. Most people are familiar with explicit knowledge which is easily transmissible. However, tacit knowledge refers to an individual's knowledge which can be transferred, although with greater difficulty than explicit knowledge (Kikoski & Kikoski 2004).

From the relevant literature, the definition of tacit and explicit knowledge is described below.

2.3.1. Explicit Knowledge and Tacit Knowledge

Explicit knowledge can be transmitted through: data forms, handbooks, words, and scientific formulae amongst others. This knowledge can be stored and processed in databases so it can be used by anyone in an organisation (Civi 2000).

Typically, explicit knowledge refers to knowledge that has been expressed in words and numbers. Such knowledge can be shared formally and systematically in the form of data, specifications, manuals, drawings, audio and video tapes, computer programs, and patents (Fernandez, Gonzalez & Sabherwal 2004). For example, the basic principles for stock market analysis contained in a book or manual are considered explicit knowledge. Moreover, this knowledge can be used by investors while making decisions about buying or selling stocks.

While explicit knowledge is material knowledge, Tacit knowledge is systematic knowledge (Hamel 1991).

Basically, tacit knowledge cannot be formally exchanged, and it is difficult to communicate or share with others (Helen 2006; Nonaka, I. 1994). Civi (2000) argues that tacit knowledge can be divided into two dimensions. The first dimension deals with technical skills. Know-how for instance, is an informal skill. The second dimension is the cognitive dimension and it refers to beliefs, values, ideals and mental models (Civi 2000). Moreover, Fernandez et al. (2004) have supported ideas that tacit knowledge includes insights, intuitions, and hunches, which are difficult to express, formalize, and share. Tacit knowledge is more likely to be personal and based on individual experiences and activities. For example, it is through years of observing a particular industry that stock market analysts gain knowledge that helps them make recommendations to investors regrading short-term and long-term prospects of stocks of companies within that industry.

Nonaka and Takeuchi (1995) explain their assumption that knowledge is created by humans and will increase social interaction via a correlation between tacit knowledge and explicit knowledge. They also expounded a conversion model, known as the knowledge creation process, where it would be possible to change knowledge by using tools like concepts, metaphors and hypotheses. They termed this conversion model "externalization".

Externalization can normally be seen in human activity. For example people write reports after participating in workshops. When they distribute and copy the report, they are actually converting explicit knowledge to tacit knowledge (Civi 2000). A detailed explanation regarding the externalization process is provided when discussing the knowledge conversion process (SECI) subsequently.

Moreover, Nonaka and Takeuchi (1995) argue that western society is focused on explicit knowledge, which involves formal and systematic communication, whereas Japanese

companies recognize and value the concept of tacit knowledge. The purpose of communication is to convert tacit to explicit knowledge and add value to the organisation (Lehaney et al. 2004).

Therefore, it can be argued that formal organisational systems are limited in scope and cannot capture the culture of the organisation. Alternatively, there may be methods that provide the means to translate tacit knowledge into a comprehensible, explicit language (Lehaney et al. 2004).

2.3.2. Tacit knowledge

When business cycles are dynamic and technology changes rapidly, intellectual capital gets represented as a primary and crucial value created by the firm. Tacit knowledge has been described and defined in the concept of intellectual capital as being one of the important elements supporting business strategies (Saint-Onge 1996).

Tacit knowledge has been termed individual knowledge. A characteristic feature of this knowledge is defined through many concepts. For example, Saint-Onge defined tacit knowledge as including: intuition, perspective, beliefs and values that people drew from their experiences.

Saint-Onge stated in his report that "out of the beliefs and assumptions in our individual mindsets, we make decisions and develop patterns of behaviour for everything we do. Our mindsets feed on themselves both positively and negatively – we believe what we see and we see what we believe."

He also believed that tacit knowledge could be shared by two entities.

Firstly, tacit knowledge is at the individual level. It forms a mental grid. It is a unique set of beliefs and assumptions through which people filter and interpret what they see and do. The grid displays their behaviour and guides them like a navigator. It works like a lens that can

filter, interpret and understand personal experiences and communication. Therefore, tacit knowledge can set boundaries for performances and results in humans.

Secondly, tacit knowledge is evident within organisations. It is defined as the collective mindset of the people in that organisation. The organisation believes that tacit knowledge can be constructed as a unique set of beliefs and assumptions to be used as a filter. Knowledge is valuable for everyone in the organisation. However, the organisation adopts values, principles and ways of doing things to support these beliefs and assumptions. Several organisations know that tacit knowledge can probably impact greatly on the collective perceptions and behaviours of the members in the organisation because tacit knowledge can deduce how the organisation makes decisions and shapes the collective behaviours of its members (Saint-Onge 1996).

2.4 Exchange of Knowledge in the Network

Knowledge-exchange is an interesting topic. This section discusses data, information and knowledge-exchange between organisations and within the business network.

Exchange, in contrast, focuses on sharing of explicit knowledge. It is used to communicate or transfer explicit knowledge between individuals, groups and organisations (Grant 1996). In general, the process of exchange of explicit knowledge does not differ from the process of communication of information. For example, employees by transferring a product design manual from one to the other, can use the explicit knowledge contained in the manual (Fernandez, Gonzalez & Sabherwal 2004).

Knowledge-exchange within a network can help businesses become flexible. Some organisations express concern about an over-exchange of knowledge, Burton-Jones (1999) on the contrary, suggests that too much knowledge-exchange and redundancy in the network is more useful than inadequate knowledge-exchange.

The Knowledge Management System is used to manage knowledge-exchange within a network. As knowledge is located in several areas of the network such as: in humans (tacit knowledge) and in the form of physical data (explicit knowledge), a network should develop a common process, including priorities and approaches to produce new knowledge (Nonaka, I. 1994).

Moreover, knowledge-exchange can be used to bring about technology transfer among business networks. In international businesses, members seek mutual assistance to increase mutual profits. Competition in the new markets is the new strategy that is evident in developing countries. New business alliances are created in developing countries to compete with foreign competitors. A technology transfer is conducted during this transaction. In the U.S. and Japan, the host businesses try to transfer their technologies to their foreign operations to help them remain competitive. They establish sub-companies in several countries such as India, Malaysia, and China to produce goods and send and create the necessary tools such as technological systems, operations systems and knowledge systems to gain greater competitive advantages. Moreover, their subsidiaries exchange some knowledge, information and problems with the parent companies to improve and make more efficient, the organisational networks (Agmon & Glinow 1991).

However, knowledge-exchange is not only limited to an exchange of technology. In human resources, employees play an important role to help a system become more flexible. People in the network can easily share ideas by using the basic tool that is verbal communication (Heisig, Vorbeck & Mertins 2003). The results of some research reported that over 50% of the transfers and exchange of information and knowledge is verbal, depending upon the situation (Heisig, Vorbeck & Mertins 2003). Communication between employees and a membership of networks helps identify and resolve gaps in knowledge. Moreover, this can assist the development of new knowledge in collaborating firms (Burton-Jones 1999).

While discussing tacit and explicit knowledge, it must be pointed out that the organisation should have the ability to collect this knowledge and store it for future retrieval. In the case of explicit knowledge, it is easy to provide a new partner to perform a task. This is because the knowledge is already internalised so the new partner can absorb the collective knowledge rapidly. On the other hand, if the ratio of tacit knowledge in a relationship is higher than explicit knowledge, then, the ability to absorb knowledge will be difficult for new partners even if they are able to internalise and utilize that knowledge (Anon 2002).

2.5 Conversion of Tacit Knowledge and Explicit Knowledge

Nonaka and Takeuchi (1995) use the distinction of knowledge from Polanyi's concept (tacit and explicit knowledge) to explain the interaction between two knowledge forms. They have created the 'knowledge creation spiral' to illustrate the relationship between the epistemological and ontological dimension of knowledge creation. The objective of this model is to show the new concept in term of creating knowledge.

Nonaka and Takeuchi (1995) have explained the four modes of knowledge creation:

1. The socialization mode (from individual tacit knowledge to group tacit knowledge): This is the process of creating common tacit knowledge through shared experiences. People can acquire the technical skills through observation, imitation and practice.

2. The externalization mode (from tacit knowledge to explicit knowledge): This is the process of articulating tacit knowledge as an explicit concept. Tacit knowledge becomes explicit through the use of metaphors, analogies, concepts, hypotheses or models.

3. The combination mode (from separate explicit knowledge to systemic explicit knowledge): This is the process of assembling new and existing explicit knowledge and transforming it into systemic knowledge such as: a set of specifications for a prototype of a new product.

4. The internalisation (from explicit knowledge to tacit knowledge): This is the process of converting explicit knowledge into operational knowledge such as: know-how. This mode is generated by learning and by doing (Krogh, Kleine & Roos 1998). Each type of knowledge can be converted. The knowledge conversion model is displayed in Figure 2.1.

It is obviously seen that Nonaka and Takeuchi use the word 'conversion' instead of 'transfer' because the knowledge cannot transfer directly without the enablers.

Therefore, this study interestingly focuses on knowledge-conversion between tacit knowledge and explicit knowledge.

Nonaka (1994) proposes that tacit knowledge can be transformed into explicit knowledge through communication. His work focuses on the process of knowledge creation during the new product development phase in an organisation. He also states that organisations can use the benefits of this knowledge and amplify their new knowledge base if they convert tacit knowledge to explicit knowledge.

According to Winter and Zolio (2001) knowledge codification refers to a process of transforming tacit knowledge into the explicit form. In organisations, employees try to use dynamic processes to convert tacit knowledge into explicit knowledge (Nonaka, I. & Takeuchi 1995). Moreover, the concept of knowledge-conversion from tacit to explicit, (Nonaka and Takeuchi, 1995) has shown four different types of process results: operational, sympathetic, conceptual and systemic.

We can therefore conclude that knowledge can be both tacit and explicit (Nonaka, I. & Takeuchi 1995). Organisations can create, store, use and transfer this knowledge in order to improve their performance, set new goals, enhance innovations and bring about reduced costs (Thall 2005).

However, Numata and Taura (1996) believe that amplifying knowledge brings about an interaction between tacit knowledge and explicit knowledge. Knowledge-conversion is a creative problem solving process. Tacit knowledge is the means of metaphoric language and symbolism. It is not inexpressible. Therefore, processes of conversion from tacit knowledge to explicit knowledge create metaphor and analogy.

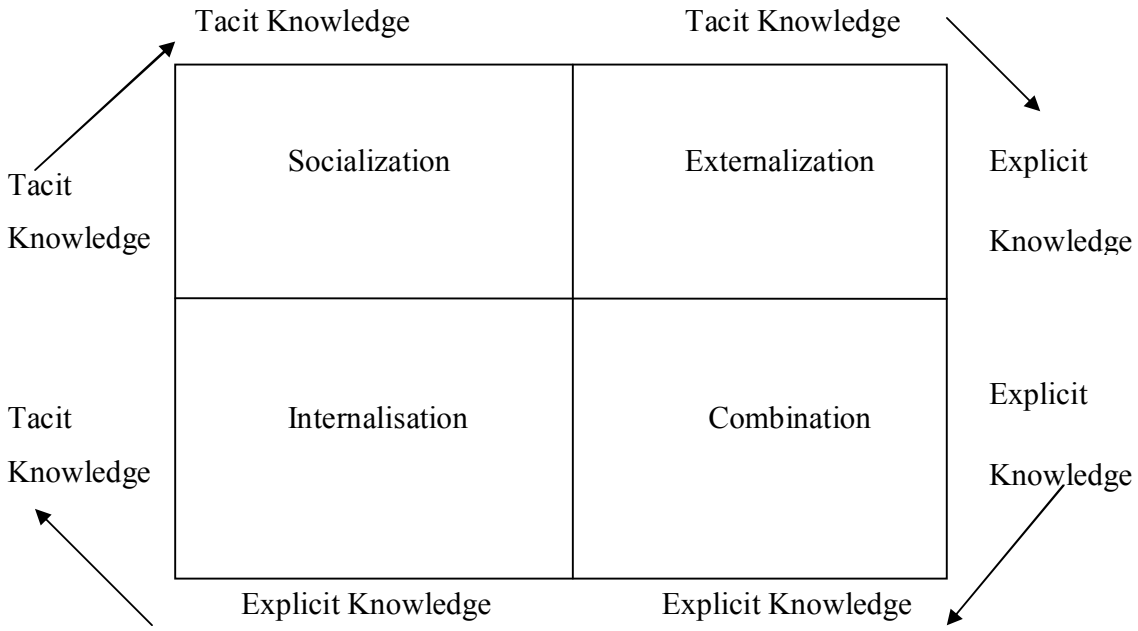

Figure 2-1 Four modes of knowledge conversion (adapted from Nonaka and Takeuchi, 1995)

In summary, it can be said that the heart of Nonaka's work has as its foundation the two types of knowledge (tacit and explicit). He stated that the knowledge conversion model can take place in any areas. At a Knowledge Advantage Conference (1997), Nonaka showed his current area of interest and shared some of his ideas regarding the knowledge conversion model. The place of knowledge creation and where the knowledge spiral takes place is explained by the following example.

- The knowledge conversion can be physical — Office.
- The knowledge conversion can be Virtual — Email, Teleconferencing.
- The knowledge conversion can be Mental—shared experiences, ideas and beliefs.
- The knowledge conversion can be Relationship— people sharing common goals.

However, the knowledge conversion would be conducted more effectively by using suitable enablers. Nonaka shows the five key enablers to support the model. They consist of Vision, Strategy, Structure, System, and Staff. These enablers indentified can support the activities in each of the four knowledge conversion areas (Nonaka, Ikujiro 1997).

2.6 The Knowledge-sharing System

The system of knowledge-sharing can be described as a system that enables members of an organisation to acquire tacit and explicit knowledge from each other. Knowledge-sharing systems must attract a critical volume of knowledge seekers and knowledge owners for them to be effective (Dignum 2002). The main function of a knowledge-sharing system is to enhance the organisation's competitiveness by improving the way it manages its knowledge (Abecker et al. 1998).

Fernandez et al (2004) stated that knowledge-sharing systems are processes which support sharing of explicit knowledge (supporting exchange) and sharing of tacit knowledge (promoting share). In addition, knowledge-sharing systems also utilize mechanisms and technologies that facilitate exchange. For example: some of the mechanisms that facilitate exchange of knowledge are memos, manuals, progress reports, letters, and presentations. Technologies facilitating such exchanges include groupware, web-based access to data, and databases.

The role of social networks may be significant but the scope of this thesis focus on knowledge conversion process.

2.7 The Concept of Knowledge-sharing and Knowledge-sharing Systems

Knowledge-sharing is the process by which explicit or tacit knowledge is communicated to other individuals. There are three important clarifications within the concept of knowledge-sharing. First, knowledge-sharing is a means of effective transfer. The recipient of this knowledge can understand it well enough to act on it (Jensen & Meckling 1996). Second, what is shared is knowledge instead of just recommendations based on that knowledge. It simply involves a utilization of knowledge without the recipient internalizing the shared knowledge (Fernandez, Gonzalez & Sabherwal 2004). Third, knowledge-sharing may take place across individuals and groups, departments, or organisations (Alavi & Leidner 2001).

2.8 Barriers to Knowledge-sharing

There are many factors to represent the barriers to knowledge transfer within a network. Szulanski (1994) showed that there are four key reasons why knowledge cannot be easily transferred.

1. Ignorance: This can be explained by people who possess knowledge and do not know whether anybody needs this knowledge or not. Simultaneously, people who need this knowledge are unaware of whether this knowledge is available in the organisation.

2. No Absorbent Capacity: It can be stated that the employees of an organisation require time, money, and management resources to practise and study that knowledge in adequate detail to make it useful.

3. Lack of Pre-existing Relationships: It can be said that a manager cannot create good relationships in an organisation and cannot control a corporate employee's experience at work though the employee is already learning and practising knowledge garnered from other people.

4. Lack of Motivation: It must be clarified that sometimes employees cannot see the business logic for following the steps for effective knowledge transfer and best practices.

O'Dell and Grayson (1998) and Dixon (2000) show support for ideas about other barriers and problems facing knowledge transfer.

1. As organisations build complex databases and implement platforms which allow employees and managers to record and enter documented knowledge, there emerges a problem about using this data. Most of the important data cannot be processed or written down owing to security concerns and so this data cannot be transformed into explicit data.

2. Some companies do not implement incentive schemes and therefore lack a culture that encourages knowledge transfer. Hence, it can be said that people in such organisations lack the motivation to share their ideas.

3. Some groups do not prefer to use any ideas if these are not born from among their members. This can occur in some companies involved in production or design. Some employees may not be happy if they have to borrow someone else's ideas.

Additionally, Jessica Keyes discovered that there are a many of barriers to knowledge sharing and willingness to share knowledge. Keyes (2008) presented that there are four key factors that have an impact on effective knowledge sharing: management involvement and oversight, willingness to share knowledge, IT support, and use of metrics. The key reasons of willingness to share knowledge in employees were: 1) available IT, 2) available time and available and organised information, 3) trust, respect, and comfort, and 4) politics and job security.

Moreover, the organisational factors which were found in companies may be an obstructer to effective knowledge sharing within an organisation such as age, gender, ICT supporting system, organisational culture, employee competition, lack of training and so on (Keyes 2008; Lopez-Nicolas & Meroño-Cerdán 2009; Mayfield 2008; Riege 2005; Willem & Scarbrough 2006). Willem and Scarbrough (2006) found the relationship of a negative effects of power in social capital and organisational politics that can affect knowledge sharing.

Issues of the problem of national background and cultural difference in knowledge sharing patterns were exposed in several studies (Ardichvili et al. 2006; Chow, Deng & Ho 2000; Hwang, Francesco & Kessler 2003). There was an example of cultural difference that was found in Chinese national background and United States. The study indicated that Chinese employees had a high level of reluctance to share information and knowledge more than United States nation. They found that Chinese employees were willing to share knowledge through informal communication. This result was supported and explained more in 2009 by Tong and Mitra (2009).The study of Tong and Mitra focused on macro organisational level and mentioned on traditional Chinese culture as below.

> "*Traditional Chinese cultural expectations encourage competitiveness. There is no doubt that competitiveness can increase employees' commitment to their work. But meanwhile, it also creates a harmful atmosphere, in which employees would not like to share knowledge with their fellow workers, colleagues or career competitors*".

In conclusion, the barriers of sharing knowledge were studied widely by previous research. However, the effective sharing of knowledge cannot be significantly promoted in an organisation if people have different ideas and attitudes. Some people prevent sharing of their knowledge with others because of cultural base factors (Al-Karaghouli, Alshawi & Fitzgerald 2005; Lin 2006; Ritter & Choi 2000; Tong & Mitra 2009). Some people are afraid to speak up because this is exposing oneself to other people who might know something more than them (Chee 2003). For finding some exist barriers of knowledge conversion and knowledge sharing in Thai public organisations, knowledge conversion procedures, knowledge sharing activities in organisations, finding key problems and create a suitable diagram were concerned in this study.

2.9 Using Information Technology to Support Knowledge Transfer.

According to Mansell & When (1998), implementing new technology can help organisations create new products and services to achieve a competitive advantage in the modern world. It can also take an innovative organisation far ahead of the competition.

While the critical role of knowledge is increasingly being recognized in the business world, utilization of technology in applications that most businesses require to gain competitive advantage is not far behind.

Companies are able to gain and secure their competitive edge by formulating business strategies via their knowledge-based systems. Information technology (IT) can convert data and information about competitors into knowledge that is most useful for managers (O'Leary & Selfridge 2000).

However, companies need to build the transfer platforms to support technologies that they will use (O'Dell & Grayson 1998). Most companies seem to have already set up their information technology architecture. O'Dell and Grayson (1998) report that for many companies the "help desk" function and tacit knowledge (know-how), is often transferred via human communication. Companies set up discussion groups and help desks to convey best practices. While knowledge-conversion between tacit and explicit knowledge is important, companies also spend a lot of money and time to distribute and convey tacit knowledge to their employees (Hyun-Soo & Yung-Ho 2003).

Daelim Information & Telecommunication Company has used the knowledge-conversion concept in their organisation to address concerns about transforming tacit knowledge to explicit knowledge by using the Question & Answer system in online communication (the online forum board) (Hyun-Soo & Yung-Ho 2003).

In a business network, each company can transfer knowledge via several technologies such as the Internet, data warehouse, chat room, e-mail and so on. Collaborative tools have also been used by several companies to share knowledge and information within their network. Collaborative tools such as Groupware have been created based on communication practices through the internet or the intranet. Lotus Notes are also often available on a company's intranet system. Any department in a company can share information via Lotus Notes. For example, the sales department of an organisation can share customer data and record customer preferences in the database (O'Dell & Grayson 1998). Moreover, members in a network can improve and amplify data and enter knowledge into a knowledge-network. Some organisations even allow employees and non-employees to access their database (Hyun-Soo & Yung-Ho 2003) .

2.10 Knowledge Management (KM)

> "*A trans-disciplinary approach to improving organisational outcomes and learning, through maximising the use of knowledge. It involves the design, implementation and review of social and technological activities and processes to improve the creating, sharing and applying or using of knowledge. Knowledge management is concerned with innovation and sharing behaviours, managing complexity and ambiguity through knowledge networks and connections, exploring smart processes and deploying people-centric technologies*." (Knowledge management definition from (AS 5037-2005 Definition 1.3.7))

Knowledge Management is primarily a means of storing knowledge which is used more as explicit knowledge rather than tacit knowledge given that most of the knowledge is retained in the form of documents such as manuals, journals etc. However, it is argued that the concept of knowledge management in the 1990s failed to maximize people's full potential (Nakra 2000).

A subsequent phase of Knowledge Management made many organisations pay attention to knowledge processes and the fact that whatever was transformed or shared due to KM was a part of human activity. Organisations need to understand that humans are very important assets for their growth and sustenance.

The third phase of KM focuses on how organisations adopt business knowledge much quicker than attempts to innovate, revise their processes and products (Mclean, 1999). KM and the Knowledge Management System (KMS) have to work together and encompass the "four processes of knowledge creation, storing/retrieving, transfer and application" (Alavi & Leidner 2001).

KM consists of people, processes and technology. People are a critical element because they have to be linked with all the other components to operate KM. This will be accomplished when they work or engage in any activities. They have to share knowledge, ask questions and listen to each other.

Process is a crucial component of knowledge as well because it is a channel that connects people and technology. It makes communication of knowledge easier and enables sharing and storing of knowledge and information. For example, the Board of Executives may need to meet with the CEO who is in another country. They will put technology to get advantage of videoconferencing facilities. KM is important for an organisation because people have to use KM which they can share with others and then develop their own knowledge and also enable proper applications to help an organisation accomplish its goals (Brelade & Harman 2000). Some authors claim that "Knowledge is a collection of multiple experiences and perspectives to which various persons over a particular period have contributed." (Koulopoulos & Frappaolo 1999).

KM is a strategy to get the right knowledge to the right people at right time so as to help people share information with each other to enhance their potential and to improve organisational performance (O'Dell & Grayson 1998). Other authors claim that "KM is no simple task and involves many complex organisation issues" (Davenport 2000). Therefore, the objective of KM is to support learning within the organisation. One of the tools used for this purpose is e-learning technologies which can help improve the employees' abilities. Moreover, KM is supported by an organisation's human resources, organisational processes and information technologies. It also focuses on the sharing of knowledge and deals with ideas and expertise. It does not depend on the amount of information gathered but on how they create a connection to link knowledge and people (Collison & Parcell 2001).

2.10.1. The Knowledge Worker

Employees or workers are people who offer their skills and competencies in exchange for remuneration. Therefore, a knowledge worker is the key that drives the organisation to succeed because of his\her education and experience (Rumizen 2001). However, the organisation needs to provide a challenging job, career opportunities, appropriate workplace environment and on-the-job training so that the employees are ready to apply their knowledge to solve new problems and learn new skills to enhance their potential (Davenport & Marchand 2000).

2.10.2. Knowledge Management and Knowledge Innovation

KM has another significant aspect. Some authors mention KM as a process of developing and enhancing information management and human resource management. KM as a process consists of three factors: knowledge, humans and technology. Knowledge is the object to be gained, humans are the link between knowledge and technology and technology is the method to support knowledge management efficiency. The basic goal of KM is to bring about knowledge innovation where people have to use existing knowledge to create new knowledge. Many organisations consider knowledge to be a crucial factor in

guiding them towards success. This leads them to push everyone in the organisation to develop themselves. Therefore, Knowledge Innovation is a way to find a channel for technology to make knowledge creation stronger in the organisation (Darroch 2005).

The relationship between KM and Knowledge Innovation is easily understood if we see the former as a foundation or base that supplies the methods and the environment for achieving excellence. This means that KM provides and works very closely with Human Management rather than Knowledge innovation due to Knowledge innovation being only a process to help KM efficiency. Although, some people lack an understanding of the concept of knowledge innovation, they attempt to improve their ability and enhance their potential much more when undertaking the task of knowledge innovation. Though KM is a more important factor for an organisation, yet it is knowledge innovation that needs a higher level of, and advanced technological methods. However, KM is critical because of its close relationship with the environment within an organisation and the way it enables the growth of a culture within the workplace. Therefore, knowledge innovation is required to help KM build an organisational culture. This is a sensitive task that mandates concentration on people and knowledge and the emphasis on knowledge innovation will be seen as a way to make communication and sharing of knowledge possible both inside and outside the organisation.

Therefore, if an organisation wants to make knowledge management an important accomplishment, it has to work towards knowledge innovation first (Darroch 2005). Kolbitsch (2006) claimed that KM has a selection of services that includes communication and sharing of information that enables people living in different places to connect at the same time. This kind of service is divided as follows: Blogs, Wikis, Social Networks and Blended Systems are modes which are often used as knowledge innovation channels.

Blogs are a communication network similar to newsgroups, diaries and personal journals (Blood 2002) where people author posts, diaries and journals and share information on work and social lives. These also let other people read and comment on the blog.

A Wiki is a network where one can develop and edit content on the web, invite people to comment on the topic if they share similar interests and allow people to add new topics as well. This is web based and entails mandatory registration of user profiles prior to any other activity. All users are held accountable for their actions and are not permitted to engage in illegal activities (Kolbitsch 2006).

Social networking is a service that provides a communication network like chat for sharing information with others. This is one network where people can make their profiles public on the web and let other people see them and approach them.

The blended system is a system which develops blogs, wikis and social networking platforms but remains an autonomous system that is independent of each of these components. Therefore, the blended system is a method that combines all the networks mentioned above and works with efficiency.

2.11 Awareness of KM in the Public Sector

The most important aspect in the study of KM is its awareness of people. People in an organisation need to understand and benefit from KM. If the organisations themselves do not have any knowledge about KM practices, then no benefits will accrue to it. It is therefore essential to perceive the concept of KM and understand it as well as achieve it to make the organisation accomplish more (Sarvary 1999).

2.11.1 Benefits of KM

KM can offer many benefits to an organisation. Authors on KM (Cong & Pandya 2003; O'Leary & Selfridge 2000) mention a few advantages. While many organisations attempt to make an organisational setting to enable this, there emerge very clearly two levels of benefits:

1. for the individual

2. for the organisation.

KM can enhance an employee's potential to drive the organisation towards success. An organisation employs many people with different visions, experiences, skill sets, knowledge and ideas. This means that employees can share and learn from each other. This is a way to develop and improve each individual's skills and performance.

KM is seen to offer an organisation two benefits. That is "improving the organisation's performance through increased efficiency, productivity, quality and innovation and it also help an organisation, such as public sector, to decrease the operation expense, re-work and increase innovation and improve customer service as well" (Cong & Pandya 2003).

2.11.2 Comparison of KM in the Public and Private Sectors

Boyne (2002) mentions that the New Public Management (NPM) has suggested that the public sector should bring managerial processes from the private sector to use in their workplace to make their technical processes successful. It is also argued that though the public and private sectors operate differently, yet KM is crucial for both. Since the methods of operation and the policies are different for both, it is difficult to transfer managerial processes across sectors. Therefore there is a need for customized strategies which are designed and developed according to the requirements of organisations in the public and private sectors.

2.11.3 NPM and KM in the Public Sector

NPM (New Public Management) provides new ideas and tools to help the government run the public sector successfully and lead the organisations here, the right way. NPM is not about policy that will be set by the government but it is about what occurs after the Parliament has decided on an issue (Lane 2000). However, there are advantages and

disadvantages to NPM. It increases efficiency, produces more services and lowers expenses. On the other hand, trust decreases while transaction costs rise. However, if someone believes that the advantages outweigh the disadvantages, how KM is adopted in the public sector will determine whether it is a success or a failure (Lane 2000).

2.11.4 Importance and Needs of KM for the Government

Today, the government has to face strong competition in the domain of knowledge at both the domestic and international levels given knowledge is more critical as a tool for success than skills even in the private sector. For example: "Research institutes compete to attract the best researchers and funding while universities are increasing competition to attract the most investments, the best students and the best professors" (OECD 2003). Although goods or any valuable products in the public sector are not as important as it is in the private sector, the both sectors are seriously concern about knowledge which is a key element of successful in modern organisational management.

Nowadays, the private sector has to compete with the public sector for deliverable goods and service as well as education and knowledge (OECD 2001). However, people who are an importance in the public sector and considering to retirement, they usually transfer their knowledge to the workers who come in their place so as to continue the job and enhance the performance. Therefore, this can be termed *retention of knowledge* in the organisation and it is a way of training new staff too. This is a good way of sharing knowledge among people who are willing to share their knowledge and learn about other people's ideas (Cong & Pandya 2003). This illustrates that KM is very important for an organisation to succeed because it needs a resource like people and their knowledge to run a business and make it grow continuously.

2.11.5 Need for a Framework for KM in the Public Sector

Many authors propose several frameworks, models and perspectives for KM. However, they show that KM needs people and organisations to understand its nature (Holsapple & Joshi 1999). When an organisation in the public sector needs to make a management decision, they have to consider the interest of the stakeholders and arrive at a solution in combination with multiple parties such as the citizens, state and the local government. On the other hand, the private sector has shareholders who can be provided returns on their investment. The private sector and the public sector are different because they pay attention to different aspects. For example: the private sector looks at competition in the market while the public sector focuses on factors such as service delivery, sharing and utilization. However, both of them also show equal concern on matters related to KM because they know that to succeed, they will need to focus on and discover the way in which they can make KM efficient, especially in the public sector (Cong & Pandya 2003) .

2.11.6 Elements to be considered in the Framework for the Public Sector

CIO Council (2001) mentions three key elements of the environment: People, Processes and Technology. All of these become part of Knowledge Management because people and the organisational culture are already aspects of KM given the ways in which they collaborate to share and use their knowledge to run businesses and make the organisation successful. Processes are methods which help KM to be set methodically and enable creation, capture and sharing of knowledge. Technology is a channel to bring people to work together easily even when they are far away and make knowledge accessible to everyone. However, the organisation should understand that people are a very important component and in order to achieve success, they need to attempt to make people understand KM.

1) People

1.1 The success of the KM initiative is dependent on the people's motivation and their willingness to share their knowledge.

1.2 Employees in the organisation (all levels) should be aware of the changes and advantages of KM. If they believe that knowledge is power, sharing knowledge is a power that will take them to greater heights as a group too.

1.3 People have to build trust in the organisation, for when there is trust it is possible to share knowledge and experience.

1.4 Organisations should endeavour to make employees feel included by initiating a system of rewards and incentives which will make them feel comfortable and willing to share ideas. An example of rewards is in making knowledge-sharing a job requirement and hiring people who have capable to share knowledge (CIO Council 2001).

2) Process

This has been addressed as a method for making KM more efficient.

2.1 Identify: "core competencies, recognize strategic capabilities and knowledge domains, assess the expertise level for each knowledge domain" (Cong & Pandya 2003). Organisations must also focus on the gap between the existing knowledge and that which is required. On the other hand, they must ensure development of the existent knowledge. All this is dependent on the organisation's ability (Cong & Pandya 2003).

2.2 Capture: "Attempt to obtain needed knowledge from both inside and outside source" (Cong & Pandya 2003).

2.3 Select: Attempt to find out and then choose the appropriate knowledge for the organisation because only the right kind of knowledge will help them reach the target faster.

2.4 Store: Organisations need to organize the knowledge which they have standardized and also update and review it continuously.

2.5 Share: Provide the channels for users to assess and obtain the knowledge as and when they need.

2.6 Apply: "Utilize the knowledge in performing tasks such as solving problems, making decisions, researching ideas, and learning" (Cong & Pandya 2003). Users need to know how they can obtain knowledge required to apply to their job.

2.7 Create: Find out new knowledge such as research and best practices for their fields of work.

3) Technology

Technology is used in all the processes related to KM. It is very crucial for users as well because it provides the channel which makes them obtain the knowledge easily. Websites and blogs are two instances of technology that are often used for improvement of knowledge. Moreover, technology also provides users with the channel through which to connect with each other and receive the information and knowledge. However, this is not a solution, but just a pathway for transfer of knowledge. To achieve these, organisations need to ensure the following:

3.1 Provide adequate hardware and software for conducting KM and ensure that technology which is used in the organisation is perfect for it.

3.2 "Build a technological infrastructure as identified by employees' needs in knowledge resources and right for the processes" (Cong & Pandya 2003). This means that both process and people have to be aligned with technology.

3.3 Most organisations use the intranet for communication and sharing knowledge within the organisation. Other tools used for this purpose include e-mail, web boards for discussion and video conferencing facilities.

2.12 KM Tools and Techniques

In recent years, many organisations have paid more attention to capturing, sharing and storing knowledge.(Chowdhury 2006; Figallo & Rhine 2002; Kimble, Hildreth & Bourdon 2008; Ramalingam 2006; Wenger, McDermott & Snyder 2002) To improve the application of knowledge and to achieve success in training about knowledge management, tools for managing knowledge and supporting learning have been developed by organisations for use by their people (Ramalingam 2006). Many tools have led to the adoption of learning and knowledge-based strategies in both the public and private sectors.

According to Ramalingam (2006) these tools have been used to provide knowledge in the domains of planning, monitoring and evaluation and enhancing learning in the field of strategy development initiatives of the organisation. The author also states that management techniques (the SECI approach, Force Field analysis etc) and collaborative mechanisms (Communities to Practice (COP)), Virtual teams and Face to Face approaches etc) are important when working together, for these can reflect the way the teams work, support the internal relationships and assist the development of shared thinking.

However, this study only focuses on the importance of the knowledge conversion process and the Technology Acceptance Model. The SECI approach is chosen in this study as a clear explanation of relationship between knowledge conversion and technology usage. In addition, the tools in collaborative mechanisms in the knowledge management process are many in number and perform different functions. This study selects some interesting tools which are in use in Thai MOC Organisations. Two of these tools are: COP and Storytelling.

2.12.1 COP (Communities of Practice)

Today, Knowledge Management is an important part of the organisation's functioning because it provides the methods which help people within the organisation share their knowledge and learn from the experiences of their colleagues. However, there are many tools which are used in KM such as COP (Communities of Practice) which consists of related groups both internal and external to the organisation, which communicate and work together by sharing their knowledge and expertise. If a COP has to be built within the organisation, the organisation must first create and build a knowledge environment that supports the COP. This will enable faster knowledge creation and transfer (Grisham & Walker 2006). Moreover, Lave and Wenger (1991) state that since knowledge and practice cannot be separated, COP provides the channel that allows the formation of a group in the organisation focussed on sharing knowledge given most of the members of the group have similar work profiles and responsibilities. Hildreth (2000) claimed that COP necessitates face-to-face meetings in order to create and sustain group relations and cohesiveness. However, COP is not easy to build within an organisation because of informal relations between members of the group which hamper effective communication. Therefore, the organisation should pay attention to how to build the COP in a sustainable form. This is because COP can help the members have participation with each other in the group and also be a central unit to transfer the knowledge of whatever common sense or what the member know or is doing (Brown, J. S. & Duguid 1991).

As a precursor to building the COP in the organisation, one must create the knowledge environment. For example: Xerox Corporation builds a COP to help them spread and share Information Technology through their alliances which facilitate support for their endeavours rather than merely exercise control (Storck & Hill 2000). Another example is that of Yellow Pages which is a directory of contact numbers for people seeking specialists and experts in a particular domain. So if one is seeking a firm of lawyers, then one can look up the Yellow Pages and contact any of the numerous law firms listed there. (Grisham & Walker 2006). Peansupap and Walker (2005a) also illustrate the example of "three major

Australian contractors with global projects underway who use COPs both across the organisation for technical knowledge support and also within the project organisation for more local problem solving activities".

The reason why the knowledge environment needs to be created is because it offers essential support to the setting up and smooth functioning of the COP within the organisation. Since Knowledge Environment provides the base for learning, sharing and creating knowledge, therefore, the leaders in the organisation should scrutinize the existing knowledge because it devolves on the leaders to provide trust, care, inculcate power and smooth communication (Von Krogh, Ichijo & Takeuchi 2000). If a manager possesses leadership qualities then setting up the COP will be easier. The employees will feel comfortable and be willing to share their knowledge and also communicate with others keeping an open mind. Moreover, when a manager generates trust and care for the members of the group, it will reassure the group because they will have his support (Grisham & Walker 2006). Nonaka and Konno (1998) claim that the Japanese word "ba" refers to an organic process which consists of socialization, externalization, combination and internalisation, all of which together form the SECI cycle.

Socialization demonstrates that tacit knowledge is shared and exchanged in the group by using the knowledge of members present in the group. Although, tacit knowledge can be shared within the group, explicit knowledge is more convenient to use. Externalization refers to adding tacit knowledge to the explicit form through documentation and recording. Internalisation refers to the process of building and using the knowledge derived from others in the group who are experts in their subjects or issues. Therefore, an organisation needs strong leadership to create knowledge management. Leaders need to understand and believe that knowledge is very important for any business. Therefore, it is crucial to build trust between the group's members and offer more channels of communication between the leader and the members. Leaders should also make time so their group members can approach them and share their knowledge (Von Krogh, Ichijo & Takeuchi 2000).

COP's "data gathering sources for such studies vary. Much of the data can be gathered as observations, unstructured interviews, frequent casual and short dialogue with participants, and access to documentary data such as minutes of meetings, company procedures and project documentation sources" (Sense 2005). This quotation shows that COP uses data from members and existent documentation to share the knowledge between group members and also with people who are not physically present close to the group but who may have similar job profiles.

However, COP uses technology to help people communicate, share knowledge and also transfer documents (Hildreth, Kimble & Wright 2000).

COP is defined as "self forming, self directed and self motivation as the nature of COP is to lead team members to trust each other and motivate them to be willing to share information between members in the group" (Wenger, McDermott & Snyder 2002). The major reasons for forming a COP within the organisation may be: creation of a knowledge environment, discovery of potential members, information sharing, need to fix a time to communicate and project motivation. Due to the formation of the COP informal communication between members grows to include members having lunch together or meeting in a group after working hours for an informal chat or to share ideas. Therefore, when these people have to do a project together, they may use a COP to make their project successful (Grisham & Walker 2006). Discovery of potential members is a process which involves the leader or project manager who should know everything about the members of the group starting with whether they need to learn more about their job and extending right up to their backgrounds inclusive of their citizenship, language and religious beliefs. Information sharing refers to the use of the SECI model to understand how knowledge is created as a flow of information which transforms tacit knowledge and explicit knowledge (Nonaka, I. & Takeuchi 1995). Therefore, for managers to use information effectively, they need to know everything in a convenient manner. COP will not succeed if people do not know where or how to find information that may interest and benefit the group as a whole. Time to communicate is another COP accomplishment that is realized if the leader is able to fix a time to communicate with his group. Wenger (2002) claims that leaders support organisational and

individual learning by providing time for members to participate and share their ideas with co-workers. Some leaders set a time period of 2 hours a week to catch up with group members and undertake follow ups.

Project motivation is also a crucial element because it is the responsibility of the team leaders to motivate their groups. Good leaders should be able to build power, trust and good communication within the organisation because members are the key to smooth functioning of the organisation. Absence of mutual trust will lead to failure. Therefore, it is the leader's responsibility to make them understand the importance of knowledge and to enhance their potential (Bass 1985). Sometimes COP may fail and result in lack of information, lack of planning and lack of leadership but the organisation should then offer some reward and recognition to its staff so that they can raise their performance and also enhance their potential (McFillen & Maloney 1988).

2.12.2 Storytelling

Storytelling is a tool used by organisations today to make day-to-day functioning smoother. Denning (2005) mentioned that an organisation should put storytelling at the centre because most people tell stories based on their business experiences. According to Brown (2005), Prusak who is a former executive of IBM states that storytelling needs to be face-to-face as conversation is required to run the business or organisation successfully. New technology being used in the organisation assumes a critical position as it links people who work in different places. For example, when engineers work on the same project from different locations such as Delhi, Dublin and Denver, they use cutting edge technological tools like NetMeeting and Web cameras to discuss their project. Moreover, some organisations also use blogs as tools to share information via storytelling. For example: "Bob Lutz, current vice chairman of General Motors, has his own blog as a corporate response to traditional media's presentation of their autos in a fierce global market" (Comstock 2006).

Another example is “story telling is worth 1.8 trillion in the US economy”. According to Stephen Denning (2005), former program director for KM at the World Bank, storytelling is a powerful tool for organisational change and knowledge management which makes the organisation successful and contributes 28% of GNP (Gross National Product). He believes that the economy relates to storytelling. He mentions five key characteristics of storytelling: salience, sense making, endurance, comfort and authenticity.

He also provides other examples of storytelling which have made a difference internally to the organisation. For example, engineers in Xerox tell each other stories about mechanical problems of the photocopiers and share solutions to these problems. The conversation between these engineers is actually an instance of a two way communication and an example of the tool which has been adapted to make their job easier.

2.13 TAM (The Technology Acceptance Model)

> *“Computer systems cannot improve organisational performance if they aren’t used. Unfortunately, resistance to end-user systems by managers and professionals is a widespread problem. To better predict, explain and increase user acceptance, we need to better understand why people accept or reject computers” (Davis et al. (1989, p.982)*

TAM was proposed by Davis (1989), who defined a TAM theoretical model based on “...the effect of system characteristics on user acceptance of computer-based information systems”.

The theoretical foundation of TAM is based on the diffusion of innovations in the area of information and technology. This theory expounded an understanding of why users accepted new information and communication technology such as the Internet, E-mail, and

Mobile phones. Hubona & Geitz (1997) claim that TAM is a measure of beliefs and attitudes which can predict behavior in the future. The development of TAM is examined by considering the relationship between two perceptual variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Legris, Ingham & Collerette (2002) claim that "TAM is used to provide a basis for tracing the impact of external variables on internal beliefs, attitudes and intention" and they also suggest that perceived ease of use and perceived usefulness are very important factors in system use.

Davis et al. (1989) pointed out the objective of TAM was "… to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user population, while at the same time being both parsimonious and theoretically justified.".

In developing TAM, perceived usefulness is defined by Davis as a "prospective user's subjective probability that using a specific application system will increase his or her job performance within an organisational context"(Davis, F.D. 1989). It can be said that PU refers to the personal belief of using the system or technology which would enhance job performance. Perceived Ease of Use (PEOU) is also defined by Davis (1989) as "the degree to which the prospective user expects the targets system to be free of effort". It can be suggested that PEOU is level of beliefs regarding usage of that technology or system which is free of mental effort. Therefore, both these tools are used to help the organisation understand technology acceptances better and for predicting users' acceptance behaviours in computer systems.

The basis for adopting the model of TAM was the Theory of Reasoned Action (TRA) as developed by Fishbein and Ajzen (1975). As Figure 2.2 illustrates, Davis suggested that the objective of TRA was to examine the beliefs, influences, attitudes, intentions and behaviours while TAM applied PU and PEOU to examine the intention to use and actual usage behavior. In TAM, the actual system use is directly related to behavioural intention while behavioural intention is based relatively on PU and attitudes to using the system.

Attitudes toward the system are dependent on PU and PEOU. Moreover, Davis was concerned that the external variable which impacted on PU and PEOU consisted of individual abilities, situational constraints, the types of IT, and so on.

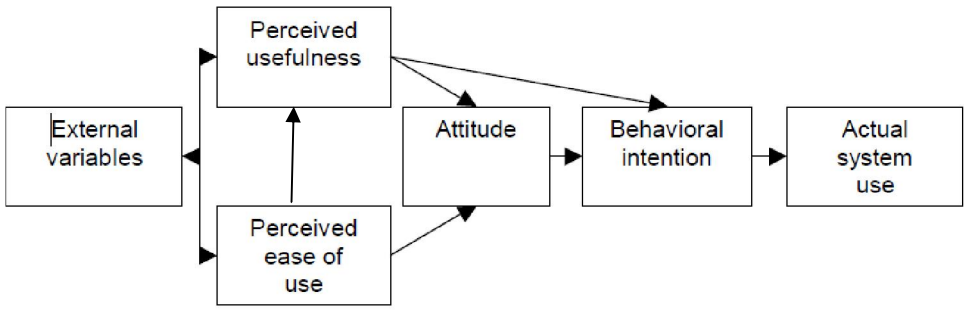

Figure 2-2 The TAM model is proposed by Davis

However, some studies have investigated PEOU and suggest that it could have an impact on actual system usage and that it also has a direct effect on PU (Davis, F. D., Bagazzi & Warshaw 1989; Gefen, D & Straub 2000). Moreover, there are several external variables which are established by a particular study in the areas of information technology and information system. Some literature also shows that implementation processes, cultural adaptations, user characteristics, compatibility and credibility of systems, and organisational structure, along with political and social influences could exercise possible external impacts on TAM (Ajzen & Fishbein 1980; Kaba, N'Da & Mbarika 2008; Li, Qi & Shu 2008; Singh et al. 2006).

2.14 The Occurrence of New IT/IS and TAM

Regarding reliability and validity, there are many studies that have attempted to examine TAM in various technologies and systems e.g. Davis, 1989; 1989; Doll et al, 1998; Singh et al., 2006.

These studies found that TAM was a reliable and valid model for predicting and explaining the human behaviour regarding information technology (IT) and information system (IS) adoption.

Information systems are very crucial to organisations today. Most companies have started focussing on this increasingly and have been attempting to invest their money in IT and IS "for many reasons, among these are: pressures to cut costs, pressures to produce more without increasing costs, and simply to improve the quality of services or products in order to stay in business" (Legris, Ingham & Collerette 2002). Therefore, much IS research concentrates on developing and testing models which help them in predicting system use. One of them is TAM which was proposed by Davis.

2.15 Examples of the use of TAM

In the last two decades, Davis's TAM has been broadly used by many researchers and practitioners to apply it to a multiplicity of IT and IS systems. Given the rapid technological developments in the 21st century, many digital technologies have been used to support people's needs. A study conducted during 1989-1999 showed that studies on TAM were concerned more with personal computer usage and application software usage such as E-mail, Word processing programs and Windows operation systems (Chau 1996; Davis, F.D. 1989; Doll, Hendrickson & Deng 1998; Mathieson 1991). On the other hand, recent research have shown a deep concern for modern technologies such as Mobile services, World Wide Web (WWW), Digital library and E-learning (Kaba, N'Da & Mbarika 2008; Moon & Kim 2001; Pedersen & Nysveen 2003; Roca, Chiu & MartA˜nez 2006; Singh et al. 2006; Thong, Hong & Tam 2002). There are several examples of the use of TAM in developing countries. For example, Kripanont (2007) used TAM to investigate

uptake of Internet technology usage in Thai business schools. Al-Hajri (2005) studied managers' perceptions of Internet technology and their tendency to adopt it in the banking industry.

There is some extension concept of TAM with other theories. For example, TAM has been studied in acceptance of blog usage in USA (Hsu & Lin 2008). This conceptual model has combined advantage of beliefs regarding technology acceptance model, knowledge sharing and social influence perspectives. In China, the concept of TAM2, subjective norm, personal innovativeness and computer anxiety has been studied in virtual learning environment (VLE) (Raaij & Schepers 2008). VLE has been designed to improve the individual study process in e-learning system. The study in VLE indicated that variables in TAM had a direct effect on VLE. Moreover, the examination in TAM's variables (the intention to use) has been investigated in a cross-cultural study between Singapore and Malaysian. This study found that multi-cultural study among Singaporean and Malaysian pre-service teachers has not differed in their behavioural intentions.

Moreover, the versions of TAM have been continually developed in last decade. Firstly, TAM was proposed in 1989. Secondly, TAM2 was developed by Viswanath Venkatesh and Fred D. Davis in 2000 to study about social influences. The subjective norm was installed in the model. Most recently, TAM3 was published in 2008 (Venkatesh, V. & Bala 2008) by focusing on greater acceptance and effective use of Information Technology (IT). Venkatesh and Bala (2008) indicated that interests and incentives had an impact on perception of job relevance, perceived of usefulness and quality output. Figure 2-3 and 2-4 presented a development of TAM's version.

However, this study intended to discover the relationship of perceiver of usefulness and perceiver ease of use, undiscovered and discovered external variables and knowledge conversion process in Thai public organisation. Therefore, the first model of TAM was used to be a based model in this study.

This can be seen that studies on TAM have not limited themselves to modern technology usage. TAM has also studied in relative contents which have an influence on organisational performance.

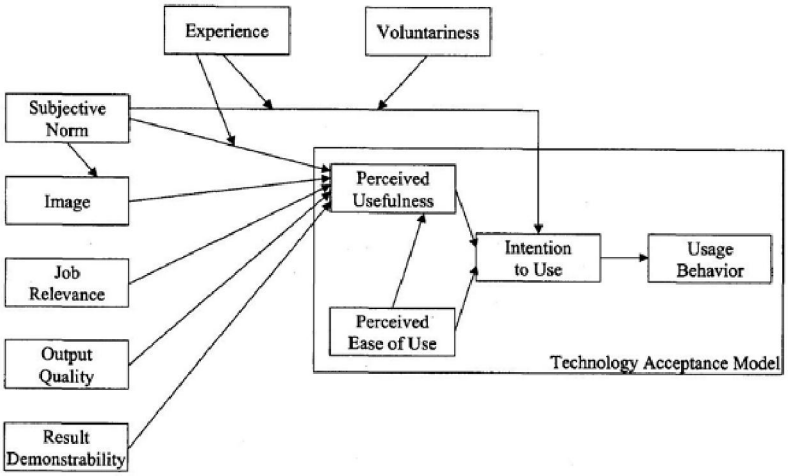

Figure 2-3 The TAM2 model is proposed by Viswanath Venkatesh and Fred D. Davis

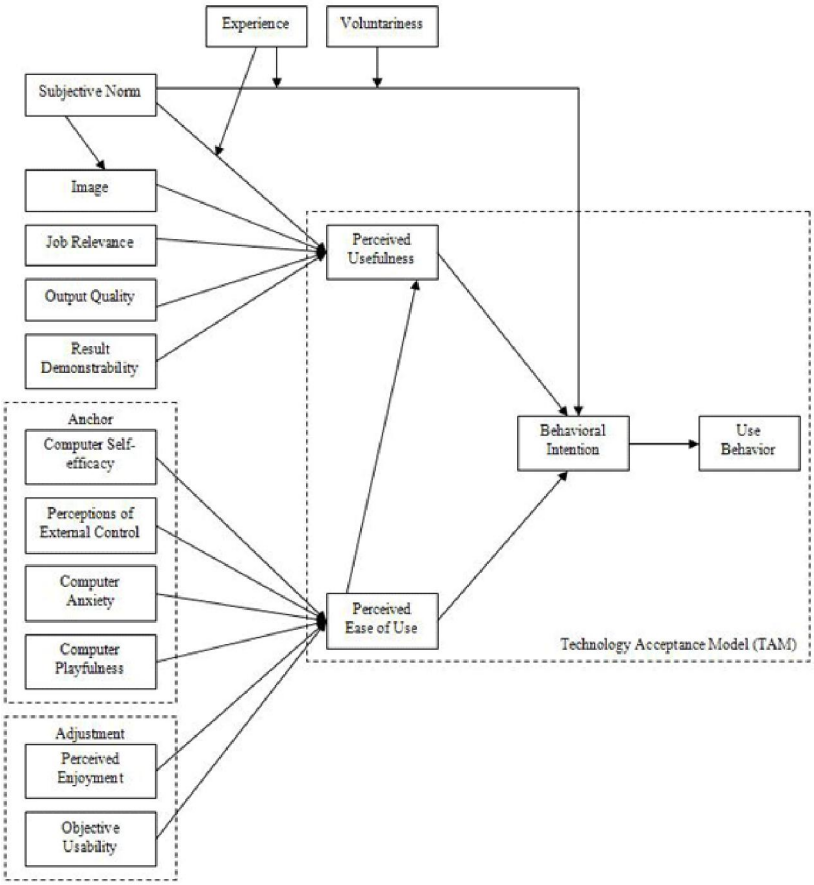

Figure 2-4 The TAM3 model is proposed by Viswanas Venkatesh and Hillol Bala

2.16 Impact of External Variables

To make KM efficient, organisations have adopted KM with advantage of Information Technology (IT) support to enable sharing and exchange of ideas within teams. IT is used as a channel to communicate when people in the team work in different places. It is then that the management team uses the TAM model within the KM process as the TAM model in information system presents an explanation of the use of information system which covers, nationalities and cross-cultural differences (Gefen, D. & Straub 1997; Legris, Ingham & Collerette 2003).

Moreover, TAM also relates to other IT channels such as voice-mail and word processors, spreadsheets and adaptive technology. Therefore, some components of TAM directly affect IT outcomes (Gefen, D. & Straub 1997) . For example: some authors claim that the researchers have to concentrate on the gender of users because men and women can respond in different ways to IT. Given that men and women are different in their social lives, in their thinking and behaviours, so when checking the pattern of communication, it is seen that men tend to concern themselves more with social hierarchy than women who use communication as a means to be network-oriented. Therefore, this shows that women are a good co-operative gender because they focus on being socially-oriented and create intimacy while men focus on seeking respect, independence and competition. All of this can impact on the results which use TAM to measure the users' behaviours (Gefen, D. & Straub 1997).

2.17 Summary

The importance of knowledge management and technology support has been concerned with new strategies to enhance performance and productivity in every organisation (Mansell & When 1998). To develop the organisation, the public and private sectors attempt to investigate suitable process for storing their own intelligent knowledge and enhancing the ability to learn and create new knowledge (Birchall & Tovstiga 1999; Nonaka, Ikujiro 1997; Nonaka, I. & Takeuchi 1995; OECD 2003). However, there are many aspects to push KM successful such as the development of knowledge sharing in an organisation, better understanding of resistance and limitation in organisations, knowledge creation processes, and technology usage in KM.

Tacit and explicit knowledge are the foundation of KM. The knowledge conversion process between two forms has been discovered in much relevant literature (Krogh, Kleine & Roos 1998; Nonaka, I & Konno 1998; Thall 2005; Winter & Zolio 2001). The Socialisation process is performed as an interaction via correlation from tacit knowledge to tacit

knowledge. Externalisation is performed as conversion from tacit to explicit. Combination process is performed as a process of assembling new and existing knowledge from explicit knowledge to systemic explicit knowledge. Internalisation is an act of reversing the process of knowledge by learning and doing.

However, the knowledge conversion process probably work effectively by using IT to support knowledge transfer (Nonaka, Ikujiro 1997; O'Leary & Selfridge 2000). Some companies used knowledge conversion concepts to address concerns about transforming knowledge by applying modern technology support such as website and online communication (Lee & Suh 2003).

In term of using technology, there are some aspects regarding the acceptance of technology in organisations. This could be connected to the ability of KM implementation in an organisation because KM consists of people, processes and technology (Brelade & Harman 2000; Collison & Parcell 2001; O'Dell & Grayson 1998).

To create a good understand of technology use, TAM has been created to help understanding of why users accepted new ICT such as the Internet, and Email. This is based on the diffusion of innovations in the area of information technology (Davis, F.D. 1989). TAM is examined by mentioning a relationship between two perceptual variables: Perceived Usefulness and Perceived Ease of Use. The perceptual variables are directly and indirectly related to some external variables such as cultural adaptations, user characteristics, compatibility and credibility of systems, organisational structure and so on (Ajzen & Fishbein 1980; Kaba, N'Da & Mbarika 2008; Li, Qi & Shu 2008; Singh et al. 2006).

Therefore, the correlation of working between KM and technology support is of more interest in modern organisations. To increase organisational performance, the organisation should not only focus on one side. They have to study both the benefits and indentify appropriate to IT support for KM implementation.

The next chapter introduces the methodology followed in conducting this research. The associated methods and techniques used for collecting data are described.

3. METHODOLOGY

The objective of this chapter is to describe a suitable methodology to study the relationship between knowledge creation, knowledge-sharing and usability of technology in the Ministry of Commerce, Thailand. The impacts could be positive or negative when considering different factors, for example, culture as well as other factors within the organisation such as age, gender, management support and any attitude which is associated with use of technology and communication.

Through a qualitative research process, interviews with knowledge workers in the Ministry of Commerce were investigated in order to demonstrate barriers or limitations which could identify the real problem in their organisation. This included some conflicts which could be said to have occurred as a result of the mis-operation of humans in organisation. In order to answer the research questions, this study used the benefits of qualitative study processes to interview people and examine cautiously all the information in depth. Methods of qualitative research were adopted in this study to examine, describe and analyse the characteristics of public sector employees in the Ministry of Commerce.

The ministry of commerce was chosen because the Royal decree on criteria and procedures for good governance in Thai public sector was established and appeared obviously in this organisation rather than other Thai public organisations.

According to the Royal Decree on Principle and Procedures for Good Public Governance B.E.2546, (section 11), the ministry of commerce (MOC) was chosen in order to enable the administration of the government agency to be in compliance with the public administration for the efficient result of the mission of the State, the government agency shall have the duty to develop knowledge base within its agency regularly so as to make itself as the knowledge base agency. In this regards, the government agency shall analyse all received information in order to produce analytical knowledge which is necessary to its practical use in its public administration correctly, rapidly and suitably for any circumstance. The

government agency shall also promote and develop knowledge and capability of, and create vision and alter attitude of, its public servants so as to be efficient and co-learning personnel. In conclusion, given to scope of a DBA thesis, other research subject could not easily be intended.

3.1. Introduction

To achieve the goal of understanding and to describe how people in MOC use technology to support knowledge creation and knowledge-sharing processes, open-ended interview questions were found to be the most suitable to allow free communication exposing attitudes and revealing insights. The researcher asked 'what', 'how' and 'why' questions to investigate the new variables and real problems in the organisation. The researcher always asked the 'what' questions as precursors to the 'how' and 'why' questions. Moreover, there were no accesses or controls over any behavioural events during the interview. Therefore, a case study strategy was the most appropriate method to conduct this study. Due to all the above reasons, this research took advantage of a qualitative methodology using semi-structured interviews (Yin 1994).

3.2. Semi-structured Interview

Data was collected carefully by the researcher using a semi-structured, open-ended interview method that all the respondents were subjected to. The interview method was employed because the researcher wanted to get an in-depth understanding of the subjects' perspectives. The respondents could supply the details and as many facts and opinions as they wanted. The benefits of this method allowed the researcher to check the direction in which the subjects were going and to follow a new guide for the interviews. Moreover, the semi-structured interviews were applied to investigate the external factors that could impact on this study.

A semi-structured format for the interview is resorted to in this research because it is a process which will take the outcome (both attitudes and ideas) from the interviewee's perspective which will help the researcher set new questions during the interview session (Yin 1994).

Moreover, semi-structured interviews have an open format that pushes participants to reveal the truth, as they cannot predict questions beforehand and therefore will be unable to formulate answers in advance. Therefore, a semi-structured interview was seen as an important process for use in qualitative research.

To study information capability and specify target groups which are in line with the research topic, the researcher chose the process of qualitative research as a method for getting the respondents to answer the research questions.

Miles and Huberman (1994) claim that qualitative research is a process that conducts research about 'field' or 'life' situations. This means it is concerned with practical situations. These situations are naturally reflective of the everyday lives of individuals, groups, societies, and organisations.

According to Garson (2002), stated in his book "Qualitative research designs strive for in-depth understanding of subjects through such techniques as participant observation or narrative analysis, or they may strive for in-depth understanding of tests through such method as exegesis or deconstruction".

The objective of qualitative research is to explicate the ways people in particular settings attempt to understand, give an explanation, take action and manage their day-to-day situation.

Therefore, the qualitative researcher attempts to capture data on the perceptions of local actors "from the inside" through a process of deep concentration of empathetic understanding, and of suspending or 'bracketing' presumptions about the topic under discussion (Miles & Huberman 1994). The researcher is essentially the main measurement device in a qualitative study process.

The data under discussion was analysed through the process of words coding which defined that words could be gathered, categorized and distributed into semiotic segments. Then, the researcher could use them to contrast, compare, analyse and present patterns in his report.

According to Miles and Huberman (1994) qualitative data can be divided into three flows of activity: data reduction, data display, and conclusion drawing/verification. These three activities also show each of the themes in greater depth.

Data reduction is referred to as a process of selecting, focusing, simplifying, abstracting, and transforming the data that appears in written field notes or transcriptions.

Miles and Huberman (1994) suggested a number of ways that utilising computer software can aid qualitative research. There are shown in Table 3-1.

Table 3-1 Uses of computer software in qualitative studies (Miles & Huberman 1994)

Use of Computer software in qualitative studies
a) Making note in the field b) Writing up or transcribing field notes c) Editing: correcting , extending or revising field notes d) Coding: attaching key words or tags to segments of text to permit later retrieval e) Storage: keeping text in an organised database f) Search and retrieval: locating relevant segments of text and making them available for inspection g) Data "linking": connecting relevant data segments with each other, forming categories, clusters or networks of information h) Memoing: writing reflective commentaries on some aspect of the data, as a basic for deeper analysis i) Content analysis: counting frequencies, sequence or location of words and phrases j) Data display: placing selected or reduced data in a condensed, organised format, such as a matrix or network, for inspection k) Conclusion drawing and verification: aiding the analyst to interpret displayed data and to test or confirm findings l) Theory building: developing systematic, conceptually coherent explanations of findings: testing hypotheses m) Graphic mapping: creating diagrams that depict findings or theories n) Preparing interim and final reports

3.3. Tools and Techniques

In-depth interviews were used in this study in order to examine organisation structure including problems which might be kept concealed within the individual person or the organisational structure. This process might help in pulling out the unexpected answer so as to help find the new channel to set new questions to ask respondents during the interview. These answers were expected to help the researcher answer the research topic question.

Face-to- Face

There are many names for studies conducted in face-to-face research. Briggs (1986) states that around 90 percent of all social science studies use face-to-face research. Hyman & National Opinion Research Center (U.S.) (1975) also support the fact that face-to-face research is the researcher's window to the world but it is not easy to do it. The face-to-face research normally consists of: interviews, conversations and dialogues. Interview method is used in this study as an examining tool. The main purpose of an interview is to collect data of an objective kind and explain objective reality. Therefore, this method could transfer an objective of research to interviewers effectively.

3.4. Methodology for successful interviews

The researcher referred to an effective interview method: Emory's Technique. This is an interview technique that makes the interview efficient and leads to continuation of the interview process.

According to Emory (1985), the general requirement for successful face-to-face interviews consists of three factors:

- The information sought from the respondent should be accessible. While the researcher conducts the interview, the respondent should be able to recall details well enough or, if confirming documentation is required, such confirmation should be available.

- The respondent should understand his\her role in the situation that is to be a reporter of factual and objective information.
- The respondent should be motivated enough to participate constructively.

Emory (1985) suggested that the researchers must possess skilful techniques to avoid an unexpected answer from respondents. The technique needs considerable discretion in order to determine how the interview might continue.

3.5. Interview Questions

An initial set of 18 questions was used as a guide in these interviews but the exact wording of the questions differed from interview to interview. The questions were grouped into three sections.

1. Section One consisted of five structured questions to investigate general technology usage. It included queries on current technology in use, key successes in the organisation achieved through using this technology, frequency of its use in job applications, finding out attitudes and general practices and information on how to access knowledge within the organisation via technology, as well as to discover what type of technology relates to knowledge management processes conducted in this organisation and the consequent enhancement in job performance.
2. Section Two consists of five investigated questions including:
    - Technology or strategy that effects knowledge creation
    - General policies, documents, and technologies that have an effect on expressive knowledge
    - Problems and other variables that resist the sharing of knowledge in the organisation
    - Preference for use of knowledge management in the organisation

- Key factors that increase use of technology in the knowledge creation process and other factors that relate to social organisation.

The five questions formed part of an open-ended interview. Section Two aimed to find out the impact on expressive knowledge and information including real problems and variables that the organisation sees at the moment. Moreover, the answers of the respondents were compared with the issues central to the problems and variables that were stated in the section on Literature Review.

3. Section Three investigates the methods for creating knowledge and storing information. The process of knowledge conversion in organisations was investigated to indicate the frequency of use of knowledge conversion processes and how people deal with knowledge and information in an organisation. The questionnaire addressed the following topics:

- How people share knowledge and information at the work place.
- What activities are frequently used to create new knowledge or identify solutions to problems among colleagues.
- How knowledge and information have been stored in the organisation and what kind of technology deals with knowledge management including general problems during practice, in the organisation.
- What kind of strategy involves technology-enabled knowledge-sharing.
- How interviewees deal with knowledge received.
- How colleagues in the organisation deal with shared-knowledge and why they should use these methods.
- What technology is important to the process of creating, sharing, and storing knowledge and information during transitioning data between people.

- What are the results that organisation/ people expect when implementing knowledge management and the ability to share and use technology to manage knowledge in the organisation.

The three sections were used across 10 interviews in both departments including information and the communication technology (ICT) department and the human resource development department (HRD or knowledge management team).

3.6. Sample Selection

Choosing a sample group efficiently requires the researcher to match the sample with the main objective of the research topic. This is the main strategy of qualitative research which is expected to help the researcher study and gain in-depth information (Patton 1990). Ray, Coughlan and Cronin (2007) mention that qualitative examples are small and there is no minimum limit for sourcing information. Some groups might have 20-30 people or less than that, maybe 5-25 people (Leedy & Ormrod 2005).

However, there were some obstacles which occurred when selecting participants and during the interview sessions such as the amount of time each participant was allowed to attend the interview session, or the responsibility of the researcher to research the topic and reduce stressful emotions during the interview.

In using the interview method, querying the interviewees was difficult owing to two reasons:

1. The interviews lasted between 40-60 minutes and this usually took place during work hours. Several possible samplings could not manage time to be interviewed. Therefore, the possible sampling was set at 10 interviewees while the first requirement of the interview was 15 interviewees.

2. People may have been motivated by different things in different situations. These motivations could have influenced some respondents. Therefore, officers of the MOC who

have had a good deal of experience in knowledge management activity within the organisation helped design the sample selection with the researcher. The sample was selected from different parts in the departments of ICT and HR development. The people selected also exhibited different skill sets in terms of IT usage and job profile. However, all the sample had to have at least 2 years working experience at the MOC and their tasks had to be related to knowledge management activities at the work place.

Bias is an important factor which concerns most researchers. To avoid all preconceptions, the researcher investigated and prepared the context of qualitative sampling by careful design.

Richards (2005) states that there are no activities which are possible to clear a researcher's mind of preconceptions or remove bias. Although the objective of the qualitative research method is to study the existing data, researchers do not have empty minds. A good suggestion is that the researchers have to stand by strong values and loyalty to their topic.

This researcher also investigated the correctness of information by using the member checking process. The information was sent back to the interviewees in order to check its correctness. This is an important process in qualitative research (Patton 2002).

3.7. Departments

Different departments probably have different ideas about how to use technology to share knowledge and what method to use to share and convert knowledge in groups. At the MOC, there are several departments involved in knowledge management practices in the workplace. However, there are only two important departments which play an essential role in designing technology strategies and planning development of human resource and its organisation.

1. The ICT department was called the 'Office of the Permanent Secretary (OPS)' and this department looked after the technology and communication channels in the organisation and planned the strategies to enhance the MOC's job performance.

2. The HRD department was called 'The Prince Chandaburi Narunath Institute (PCN)' and this department offered course training and development of human resources and organized appropriate activities to enhance people's knowledge about the MOC.

This particular information has been described in the overview section. In fact, the people from both departments have always participated in the activities of knowledge management within the MOC. They meet to consult about technology that will support people in the organisation and create knowledge management plans. However, there are a few specialists in technology usage who support knowledge management planning in both departments.

3.8. Sample Size

The 10 interviewees from both departments participated in the research conducted by this researcher. By categorizing the interviewees into two groups, (the first group was that of the employees of the ICT department including people who worked in general and managerial positions). 7 interviews were conducted in the first group. The second group consisted of employees from the HR development department and these were only 3 in number. These interviewees had the time and the ability to participate and they comprised of a manager and a senior officer. The criteria for choosing the sample is shown below.

Table 3-2 Criteria for choosing the sample

Sample number	Position of sample	Ability and Responsibility	Department
Person A,C	Computer technical officer	Member of KM team and technical support	ICT
Person B	Computer technical officer	Specialist in SOA and team member KM	ICT
Person D	Senior computer technical officer	Trainer and motivator in KM team, supporting general act	ICT

		under KM plan, website administration	
Person E	Computer technical officer	Specialist in Network supporting and Member of KM team, information supporter to CEO	ICT
Person F	Computer technical officer	System analysis, database assistance, communicator with outsources.	ICT
Person G	Technical Manager	Plan and develop ICT in organisation, supporter KM plan	ICT
Person H	Human resource development level 6	Trainer HR course, plan maker about KM, senior member in KM team	HR development
Person I	Senior HR development officer	Human resource Analyser, Planner and strategy maker of MOC, Trainer HR course, Making action plan of MOC, KM planner.	HR development
Person J	HR Manager	Planner and strategy maker of MOC, Trainer HR course, writer HR course, adviser in HR plan and KM plan	HR development

As shown above, their abilities and responsibilities were an important issue when choosing appropriate people for research participation. Generally, at the ICT department, there are around 30 employees but not everyone works full time. 10 employees are employed as part-time officers and around 4 employees form the casual employees segment. Therefore, the actual number of full-time employees is about 15 people. The researcher discussed this aspect carefully with senior officers to identify appropriate interviewees that suited this dissertation. However, at the HR development department, the HR manager introduced 3 employees for this interview including himself because the total number of employees in the department was around 15 people and there were only 3 people who had suitable experience with KM planning and training. They could also help conduct the interview and explain strategies and plans to develop human resources.

3.9. Interviewing Protocols

Data was thus collected from interview and analysis was performed by looking for key issues related the research question.

Each interviewee was approached independently and given a brief explanation about the purpose of the study. The interviewees were asked if they were willing to participate in the research. If interviewees agreed, the consent form was given to them and this provided all details about the objective of the study and guaranteed them confidentiality of their response. MOC Thailand was the location for the interviews. A private room was set up for the face-to-face interviews. In an informal setting, the interviewee was brought in and the time for the interview was managed by the researcher and a head officer from the ICT department and HR development department.

Interviewees were also informed of the recording of the interviews and during the interview, the researcher took notes as the interviewees talked. A brief explanation was introduced firstly to ensure a clear understanding of the in research aim, research question and confidentiality of their identities. Finally, to maintain confidentiality, this research has

replaced all the names of the people and the organisation and used code names throughout the report.

To keep an informal conversational atmosphere, the researcher agreed with whatever the all interviewees said.

3.10. Summary

This research structure is built as systematically as possible. Participants were selected carefully and were specifically those people who had roles and responsibilities which involved the research theme. The researcher ensured that all of them understood the content of research and that they were willing to co-operate and be a part of this research. The information was collected coded by the researcher.

After the information was coded, it was analysed completely by arranging in group (theme, story and pattern). After examination of coding, the remaining chapter focus on the matter of code regarding the KM and IT literatures. The main research methodology for this study is the qualitative approach by using interview method to collect the deep data and undiscovered information.

The next chapter presents the data results from the interviews. All data is presented and categorised in each section to answer the research questions.

- See appendix A for a sample Consent Form
- See appendix B for a sample Information To Participants Involved in Research

4. RESULTS

This chapter presents the results of the data collected and is presented as answers to the research questions (research question1 and 2). The data was selected from the interviews.

Research questions

1. Which external variables have an impact on technology acceptance in Thai public organisations by improving or reducing the knowledge conversion process?

2. Which technologies have been used with the knowledge conversion processes (SECI) in Thai public organisations?

To answer these research questions, the researcher conducted interviews. The results were classified by use of a coding process. The data code was organized for each participant. According to the research questions of the study, the qualitative raw data was grouped by categories and themes.

Research questions 3 and 4 will be analysed and the results presented in the next chapter as both research questions have to use the context analysis process to find out relationships and conclusion.

4.1 Research Question 1 "Which external variables have an impact on technology acceptance in Thai public organisations by improving or reducing the knowledge conversion process?"

After data review and immersion in the data by the researcher (i.e., extensive reading and re-reading of the transcripts and repeated listening to recorded interviews), the results were integrated, analysed, and categorized by referring to the issue of technology usage and knowledge management. To answer the research question, the research needed to find out

the external variables that had an impact on technology acceptance by investigating external variables between knowledge-sharing activities and information technology usage.

The result can be illustrated using 2 dimensions:

1. IT dimension
2. KM dimension.

Moreover, the researcher will now show the similar variables which occurred in both the IT dimension and the KM dimension. This is probably important for the study because both dimensions may be seen to have similar and/or different variables.

However, this study really concerns the qualitative approach so the results will not be presented in quantitative style. The results will be shown as individual attitudes of respondents. It cannot be certain that all external variables in this study will influence technology acceptance in an organisation but it can guide other researchers to find out the key impacts and problems by using the quantitative approach.

4.1.1. IT dimension

The IT dimension consists of IT usage, IT most used between people, and external variables that impacts on technology acceptance.

4.1.1.1 IT usage

IT usage is defined as use of technologies and communication in the MOC. This definition also includes the technology and communication systems necessary to convert knowledge, share knowledge, communicate with people in the organisation, make decisions, solve any problems, and collect data and knowledge. There are 8 technologies that people stated most in the transcribed note. They consisted of 1) website 2) MSN Messenger 3) phone 4) Video conference 5) E-mail 6) Fax 7) Network including Internet and Intranet 8) E-service in MOC.

Table 4-1 IT usage in MOC

IT usage	website	MSN Messenger	Phone	E-mail	Fax	Network	E-service in MOC
Person	A,B,C ,D,E,F,G , H,I,J	A,B, ,D,F,H,I	A,B,C ,D,E, G, H,I,J	A,B,C ,D,E,F, G,H,I,J	E	A,B,C ,E,G, H,I	A,E,G
Sum	10	5	9	10	1	7	3

The results show that website has been stated most frequently. It is stated as a tool to communicate between people and organisations. The ICT team built a website to be a centre of knowledge in the MOC. They called it the "Website KM". Website KM has presented a lot of important information such as definition and benefit of KM, procedures of KM, strategy organisation, KM activities, Game, web board, and news. Moreover, KM teams use this website to transfer knowledge to people in the organisation and they believe that it can increase the level of knowledge-sharing. However, the techniques and tools of the website that the KM and ICT team use to convert and distribute knowledge is the web board (Question and Answers) or (Q & A).

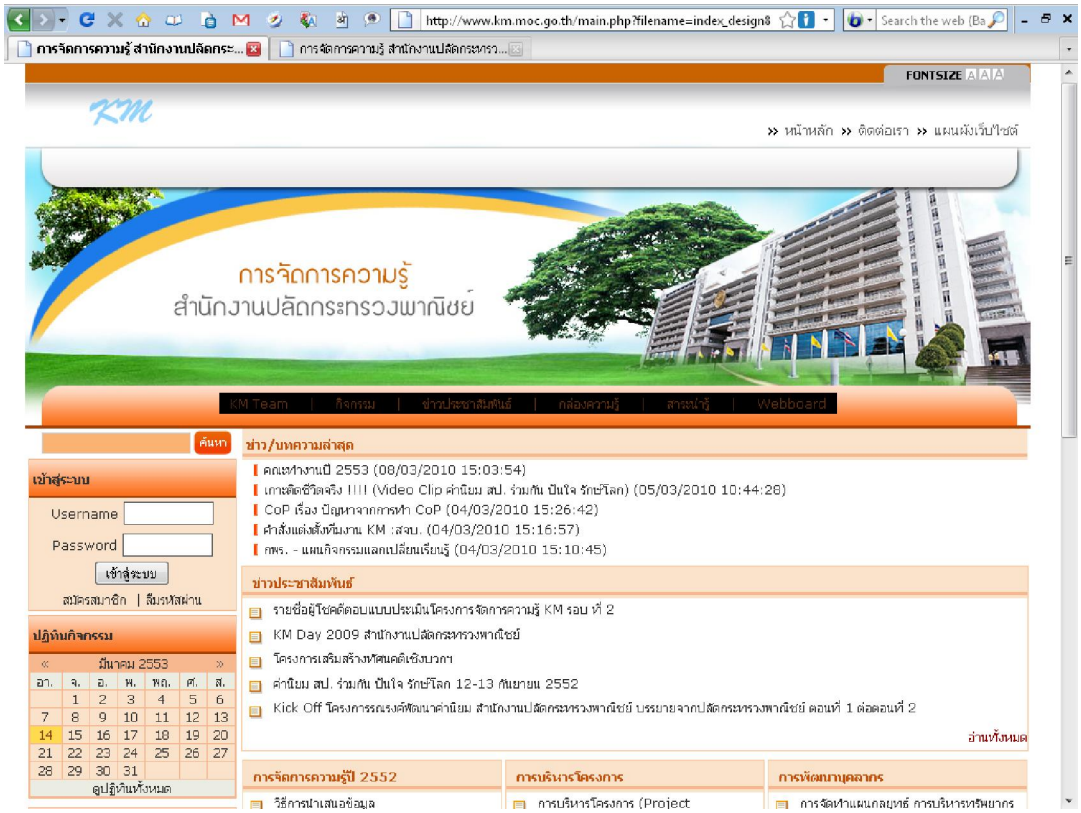

Figure 4-1 Website KM of Ministry of Commerce Thailand

4.1.1.2 IT and Frequency of usage

Technologies that are used most in order to communicate with others are MSN Messenger, Phone, and E-mail.

However, the influence of these IT tools spans opportunities and events. The Table below shows the relationship between Technology, opportunities and events.

Table 4-2 IT and Frequency of usage

Influence\IT	MSN Messenger	Phone	Email
Opportunities and event	Individual Group normal event communication in ICT team Send message to receiver when they are not available.	Urgent event Communicate with other departments	Send important file or document Distribute/share knowledge and information

From the results, (Table 4-1) it can be seen that MSN Messenger will be used when it is a normal event and a private group (people who make use of MSN Messenger have to know each other and exchange their e-mail addresses).

A normal event means that employees use MSN Messenger daily and there is no urgent event in the offing. Most employees in the ICT team will usually work in front of their own computer. They always open MSN Messenger and communicate via MSN Messenger.

From the interview survey, it is clear that most interviewees use MSN Messenger as a common communication tool. The ICT interviewees mainly use MSN Messenger to transfer knowledge between each other. Each of them has expressed their opinion concerning MSN Messenger as follows:

> *Person A: "MSN Messenger is frequently used as a way to communicate with other people because it does not require a person to engage in face-to-face conversation. She/he does not need to meet the others or worry whether the others would be available at his/her desk or not. We can leave any*

messages in MSN Messenger. However, although it is such an easy way to communicate, it is a waste for system bandwidth."

Person D: "Normally, classified information will be transferred through official e-mail system in the organisation. MSN Messenger will be used only when that information is unclassified. To interact with chiefs or bosses, who mostly do not apply for an MSN Messenger id, we usually send the information by using E-mail, Phone call, or seeing them by ourselves."

Person B: "MSN Messenger can only be used in an already-in contact group, meaning to use MSN Messenger, you need to have the other person's MSN Messenger account or e-mail address. For those who do not use MSN Messenger (do not apply for one account), you will not be able to reach them."

Besides the opinion above, Participant H has a different view of this communication type.

Person H: "I don't use MSN Messenger to communicate with other people, because in my opinion, this type of technology is suitable for only a specific group of people, such as teenagers. Employees in higher positions may not find MSN Messenger suitable for them. I, myself, prefer using telephone, e-mail or, even a letter, than MSN Messenger."

In conclusion, MSN Messenger will be used when the information is unclassified and when communication is not urgent. However, telephone and e-mail are still commonly used by various groups of people.

However, e-mail and the phone will be used when employees need to urgently communicate or contact people who do not use MSN Messenger, especially, people who are not part of the ICT team. The communication with managers/executives or transfer of important files is best accomplished by E-mail. It is clear then that the group from ICT will always tend to use MSN Messenger as central tool for communication while the KM team

will always tend to use e-mail and the phone to communicate with colleagues and managers.

4.1.1.3 External variables that may impact on technology acceptance

The results from data transcribed demonstrate that there are many variables, which might be involved in technology acceptance and knowledge management in the MOC.

Based on the interview data, the Table below shows the key factors influencing the acceptance of technology in the MOC.

Table 4-3 Key factors influencing the acceptance technology in the MOC

Theme	Variable and sub-variable

External variables that impact on technology acceptance	/ Age
	/ Attitude about Technologies
	// Perceived Ease of Use
	// Perceived Usefulness
	// Interface and interaction.
	/ Ability and Skill
	/ Culture
	// organisation
	// background
	/ Management
	// Top down management

	/ Organisation / Policies / Understanding / Securities

From the variables above, the study can compare and contrast the variables from both the IT dimension and the KM dimension. All variables are analysed with other previous studies in the subject of technology usage to determine some similar and different variables. As dissimilar environments can be the cause of different results, some organisations may use several technologies to support job performances and to solve problems in different situations, so the variables that occur in each of these locations will be linked to operational support and technological support. Therefore, the external variables in this study might have an impact on the MOC directly or indirectly. The next chapter discusses this further.

4.1.2. KM dimension

The KM dimension involves itself with the presentation of data which is related to KM implementation in the MOC. These data were investigated narrowly the details of the operation, practice and problem solving which could have occurred between KM planners and KM receivers.

The KM dimension consists of KM tools, frequency of use, problems of knowledge management, status of KM, key obstruction in implementation, status of KM and its limitation and barriers.

4.1.2.1. KM Tools

The investigation shows that there are only two KM tools that the KM team uses to implement a knowledge-sharing process in the organisation. They consist of COP (Community of Practice) and Storytelling.

Generally, KM tools are not limited only to COP or Storytelling. There are many other techniques that can be applied in the organisation. For example, brainstorming, face-to-face approaches and training. For some reason, Thai organisations give a priority to two specific tools as follows:

- COP

COP is a good tool and is preferred by most government organisations. It is a technique that puts a group of people together and lets them communicate with each other, encourages them to express their opinion and transfer knowledge to each other. It is an easy way to spread knowledge by focusing on a form of knowledge transfer called tacit knowledge, which is very easy to learn, understand, and also follow through.

> *Participant H mentioned that "COP is a pattern that provides the ability to place duty towards an organisation's leader. The leader can lead the team members to join the activities he organizes and jot the information he receives by observing usage of those information again in annual performance measurement."*

- Storytelling

Storytelling is commonly utilized in this organisation because of its ease of use. It can be used anytime and anyplace.

> *Participant D mentioned that "The storytelling technique can be used in any place with any person. It can be applied in a face-to-face conversation or with technological assistance, such as telling a story through the telephone or transferring experiences and solutions of problems through MSN Messenger.*

Usually, MSN MESSENGER is mainly used by the employee to transfer knowledge or share his experiences with co-workers. We can communicate with each other while sitting at our own desk and any information transferred can be collected in a computer automatically."

Participant E mentioned that "Storytelling is the technique I use the most to share my knowledge with my co-workers, since this technique offers unlimited time and topics for one conversation. We can use this technique easily by telling our co-workers what we will be talking about. If the topic is interesting and useful for our work, we will use the tape recorder to record the conversation, and convert them into documents and, finally, distribute them to other co-workers."

Participant B mentioned that "Even though, I am new to the KM team, I found that storytelling is the easiest and mostly used technique for me to spread my knowledge. I can share my experience only by telling those stories to my colleagues, although sometimes there are only a few listeners. In my opinion, this technique is the start of any knowledge-sharing endeavour. It changes many people's ideas about the organisation especially those people who are used to thinking that sharing knowledge is difficult to undertake."

Participant I mentioned that "Our organisation culture can be explained as a "terrified to express an opinion" culture and it also included "rarely sharing their knowledge" culture. Using a tool like Storytelling will help this organisation fix those problems."

Some problems in practice occur before and after using these KM tools. Part of the problems of knowledge management will illustrate the variables of the problem and these will be discussed in the next chapter.

However, the KM worker in each group states that COP and Storytelling might not be successful because the MOC lacks the understanding in concept and practice. Several interviewees argued that 'the environment in meeting when we are doing COP or

Storytelling is very serious and looks formal'. It is seen that concept and practice of these tools is quite different from actual MOC practices.

4.1.2.2. Frequency of use (KM practice and activities in organisation)

The frequency of use refers to the procedure of enhancing the KM implementation in the organisation. It consists of frequency of KM activities and number of KM topics. The KM team sets up KM tools while KM topics are created by each department. However, frequency of use of this activity is set to support KPI (Key Performance Indicators) of the MOC, which are estimated by the Office of the Public Sector Development Commission, Thailand (OPDC).

Table 4-4 Frequency of use and KM practices and activities in organisation

KM Tools and Activities	Frequency
KM Days	One per year
KM Topic	1 Topic per department
COP	7 Topics per year
Storytelling	1 Topic per department

The results show that MOC is really concerned about KM implementation. However, the attitude with regard to KM activity is quite different. Many interviewees claim that these activities are formulated to support and accomplish the goal of KPI but they do not support what employees really want to do. It might be said that the activities may create some problems in the progress of the KM initiative in the MOC.

4.1.2.3. Problems of Knowledge management

It is defined as the whole problem in the organisation. These problems are collected and analysed from all aspects that relate to the KM dimension.

The Table below shows the summary of data transcribed and analysed from each interviewee and deals with problems surrounding knowledge management in the MOC.

Table 4-5 Problems of Knowledge management

Problem of knowledge management	Summary of data

Problems of Knowledge management	/ Activities in KM practice
	// Topic and Activities
	/ Attitude about KM
	// Task
	// Belief
	/ Behaviours
	// Collaboration in organisation
	// Behaviours between CEO and Employee
	/ Cost and expend
	/ Culture
	// background

Problem of knowledge management	Summary of data

Problems of Knowledge management	/ People
	//Knowledge worker
	//Knowledge receiver
	/ Policies
	/ Management
	// Management between KM job and main job
	// Responsibility
	/ Strategies
	/ Supporter
	// Leader
	// Government
	/ Technologies
	// Database
	// Network
	/ Training and Communicate
	// Course training
	// Communication procedure
	/ Understanding of KM concept
	//Definition and Application in organisation

4.1.2.4. Key obstructions in implementation

The issue of key obstructions is arrived at after analysing each data interview where the interviewees stated these issues frequently. Key obstructions consist of several points. The largest number of points is about organisational culture including behavior of people in the organisation and their attitudes, support from leaders/executives and the understanding of KM. The Table below shows the levels of key obstructions in the organisation about which the interviewees held an opinion.

Table 4-6 Key obstructions in implementation

Key obstructions	Interviewees
organisational culture	A,B,D,E,F,G,H,I,J
supporting from leaders (Lack of support)	A,B,E,I
understanding of KM (Limited understanding)	A,C,E,F,H,J

The results show that organisational culture is a key obstruction in the implementation of KM. The elements of organisational culture have been shown below. They consist of a variety of attitudes displayed by the interviewees during the interview.

The Table below shows the attitudes of Thai organisational culture in the MOC.

Table 4-7 Attitudes of Thai organisational culture in the MOC

Interviewee	**Organisational culture**
A	/Thai culture (always respond CEO(Chief executive officer)' policies)

Interviewee	Organisational culture
B	/Organisational behavior does not like to talk to each other /Be afraid when you communicate with people who are higher position /Most people have no expression between colleagues
D	/Shy /Be afraid that they will have done something wrong
E	/ Thai people are not inclined to using technology often/Lack of belief
F	/ No attitude about sharing knowledge
G	/ Waiting for order from leader or CEO / No new idea, or think something different. /Be afraid that they will have done something wrong
H	/ No expression / most people believe that talking between each other cannot be noted
I	/most people believe that an extra job is not our task
J	/Thai culture (always respond CEO(Chief executive officer)' policies) / No attitude about sharing knowledge / Self-Interest in own knowledge

4.1.2.5. Status of KM

Status of KM is defined as the level of use of KM and the success of KM in the MOC. It is predicted by an individual's attitude without the key or tools to evaluate the actual results. The results show that the attitude of interviewees surrounding the status of KM in the MOC was less than 50%.This could be indentified that employees in the MOC probably got a limited understanding in KM.

In practice, the real outcome obtained from a formal evaluation system by the MOC, suggests it did not occur because the department or group who had a duty in the MOC never implemented anything to survey and nor did it receive any comments or track the evaluation of people in the organisation.

The outcomes which were received from the interview demonstrated that they formed part of the information which came from recommendations or attitudes of participants only.

The Table below show attitudes towards KM status in the MOC.

Table 4-8 Attitude towards Knowledge management status in the MOC

Interviewee	A	B	C	D	E	F	G	H	I	J
Status of KM (%)	40%	<50%	20%	40%	50%	50%	20%	30%	30%	<40%

Most interviewees strongly agreed that the status of KM is close to the 'beginner level'. They expect that the organisation might take a longer time to be a knowledge organisation. The Head of the KM team said that "In our organisation at the moment, the status of KM might be the beginner level". Beginner level was a level of learning and understanding in KM implementation. He was also concerned about the progress of KM development.

"KM concept has been used since 2004 but most employees still did not understand the KM concept until in 2006. Now, we only speak in background of KM and persuaded people to join our KM activities."

4.1.2.6. Limitations and Barriers

Limitations and Barriers show variables that might affect implementation of knowledge management in the MOC. These variables include the key problems of converting knowledge and sharing knowledge.

Table 4-9 Limitation and Barriers of knowledge management implementation

Limitations and Barriers	**Variables**

Problem of converting and sharing knowledge and implementation of knowledge management	/ Age
	/ Attitude
	/ Behaviours
	/ Culture
	// shy
	// afraid
	/ Policy
	/ Technology
	// bandwidth
	/ Transferring Techniques
	/ Understanding
	// Definition
	// Application

While the results demonstrated various ideas about KM problems, four variables come across as the main limitations in the progress of KM. They are Behaviours, Culture, Policy

and Understanding. Many interviewees stated that these four variables could be considered as real problems in the MOC. However, other problems such as transferring techniques and technological limitations should be considered as minor problems.

4.1.2.7. Key successes of KM

The interviewees show varying attitudes when asked how implementations of KM will be successful. There are 15 key successes to develop KM in organisations. The Table below shows the elements of key successes and procedures.

Table 4-10 Key successes of knowledge management

Key successes	**Procedures**
People and Collaboration	Invitation Persuasion Participation Choose the right people to be key knowledge workers
Training	Training online Training using techniques of transferring knowledge
Changes	Change communication style Change concept of KM Change organisational culture Change behaviour of Employees and CEO
Behaviours	Initiate learning together

Key successes	Procedures
Support	Support from leader or CEO Support from the Thai Government
Technologies and Tools	Make a database of Knowledge Present a variety of KM tools (Not only COP and Storytelling)
Evaluations	Evaluation of real knowledge after training (Not only an individual satisfaction) Evaluation of job performances

These key successes are an individual's attitude in particular groups. This study cannot determine these variables as whole solutions are needed to develop the MOC's KM but the study only suggests some issues that the organisation should consider, in particular, the problem of KM implementation especially as it is a new strategy in Thai public organisation.

4.2 Research question 2:"Which technologies have been used with the knowledge conversion processes (SECI) in Thai public organisations?"

Research Q2 is used to study the knowledge management format in the organisation and usability of ICT which is used in the organisation. This supports the process of knowledge adjustment and knowledge sharing in public organisation.

This section shows the result of relationship between IT support and Knowledge conversion processes.

4.2.1. Attitude about SECI process

When I asked interviewees about SECI process in the organisation or in the workplace, there were only a few people who understand the SECI concept even if all interviewees were trained with KM department. Most interviewees heard about the SECI process when they were training but they could not identify what technologies could apply to the SECI process. However, a respondent who is a head of KM Team, stated that SECI is really used in the organisation but there are only Socialisation and Externalisation process, that are used most in the organisation.

4.2.1.1. SECI process

SECI is a set of processes of converting knowledge in organisations. The results after interviews show that the processes of Socialisation and Externalisation have been used most in the organisation, while Combination and Internalisation have been used less or are undiscovered. However, the researcher collected the important data from transcribed interviews including the existing technology in the organisation, techniques and tools that are used to develop people and KM. Moreover, to find out the relationships between SECI process and Technology, the researcher combined knowledge from the literature review and raw data from interviews to present the relation in the table below.

Table 4-11 The relationship between IT in organisation and SECI process in study.

SECI process	**Technique,**	**Technologies**
Socialisation (Tacit to Tacit)	COP Story telling Meeting, Direct communication(face to face)	Phone MSN Messenger VDO conference Network (internet and intranet)

SECI process	Technique,	Technologies
Externalisation (Tacit to Explicit)	Training (E-learning) Manual and document	Website , web board(Q&A) MSN Messenger E-mail
Combination (Explicit to Explicit)	Undiscovered	Website , web board(Q&A) Share point on public server Email
Internalisation (Explicit to Tacit)	Training	Website , web board(Q&A) E-learning on website

In conclusion, although technological support to SECI processes at the MOC are not obvious, the investigation by this study shows the existing technologies and SECI process in the organisation by considering the relationship between technology and usage. Moreover, previous studies can provide some information and help this study to categorise appropriate technologies and techniques and SECI process.

4.3 Summary

This chapter demonstrates and explains the results of the data collected and answers the research questions. First, the researcher analysed the issues of technology usage and knowledge management using two dimensions: IT dimension and KM dimension.

The IT dimension consists of IT usage, the most used form of IT and the external variables that impact technology acceptance:

- IT usage was defined as the use of technology and communication in MOC. This definition also included how MOC used technology and communication systems to convert knowledge, share knowledge, communicate with people in the organisation, make decisions, solve any problems and collect data and knowledge. This highlighted eight technologies that people use to communicate in this organisation: 1. Websites 2. MSN Messenger 3. Phone 4. Video conference 5. Email 6. Fax 7. Networks, including Internet and Intranet 8. E-service. The results showed that the KM team and IT department use website KM and email to communicate with others in the organisation and also use them to convert and distribute knowledge on the Webboard (Q&A).

- IT and Frequency of usage: The technologies that were most often used in MOC to communicate with others are MSN Messenger, phone and email. The results of the interviews indicate that only people in ICT use MSN Messenger to communicate with others on the ICT team, and the KM team uses phone and email frequently to communicate. Some answers mentioned that MSN Messenger was easy to use and provides the ability to leave non-urgent messages, but there were some limitations to it as well; for example, for people to use MSN Messenger, they need to know the email address or MSN Messenger account of the person they want to speak to. Therefore, you would not be able to reach those who do not have an MSN account or who are in a position of authority. Normal communication at MOC is phone and email when employees need to urgently communicate or contact other, and they use email to communicate with managers/executives and to transfer important files.

- External variables that impact technology acceptance: There are many factors influencing the acceptance technology in MOC: Age, Attitude about Technologies, Ability and Skill, Culture, Management, Organisation, Policies, Understanding and Securities.

The KM dimension consists of KM tools, frequency of use, problems of knowledge management, status of KM, Key obstruction in implementation, status of KM and its limitations and barriers. The KM tools that are used at MOC are COP and Storytelling. COP is a technique that puts a group of people together and lets them communicate with each other. The Storytelling technique can be applied in face to face conversations or with technological assistance such as telling a story over the telephone or transferring experiences and solutions to problems through MSN Messenger. Both tools were used in MOC as the key methods for sharing and creating knowledge. The results show that MOC was really concerned about KM implementation. However, the attitude regarding KM was quite different. It might be said that the activities may create some problems in the progress of the KM initiative. Most interviewees strongly agreed that the status of KM was close to the "*beginner level*". They expected that the organisation might take longer to become a knowledge organisation.

Research Question Two studied the KM format in the organisation and the usability of ICT. After asking this question to the interviewees, it became obvious that there are few people who understand the SECI concept. They heard about the SECI process when they were training, but could not identify what technology could be applied to the SECI process. The SECI process is a process of converting knowledge in an organisation; the process that was most often used in MOC is the Socialisation and Externalisation process, while Combination and Internalisation have been used less or are undiscovered.

The next chapter discusses the external variables that impact on the knowledge management process and technology acceptance at MOC. Moreover, Research Questions Three and Four are discussed in detail.

5. DISCUSSION

5.1 Introduction

This chapter examines the overall description of external variables, success factors, barriers and benefits in the technology acceptance model and the knowledge management process at the MOC (Ministry of Commerce). The data was summarised to indicate the relative importance of the key answers to research questions (3-4). However, to investigate some interesting external variables in technology acceptance in a Thai public organisation, analytical descriptions are presented in the first section, followed by an explanation of modern technology as it relates to the SECI process in an organisation.

5.2 Discussion on Research question 1

"Which external variables have an impact on technology acceptance in Thai public organisations by improving or reducing the knowledge conversion process?"

The last chapter showed the variables between the IT dimension and the KM dimension. The objective of this chapter is to investigate several similar and different variables in both dimensions and to analyse the data collected. This chapter is divided into two subsections: The first part considers the similar variables that impact both technology acceptance and knowledge conversion. Secondly, several different variables are discussed to show how variables in both dimensions are related in both technology acceptance and knowledge conversion enhancement. Both parts refer to previous studies regarding technological support and technology acceptance.

5.2.1 Similar variables

The similar variables that most likely impact technology acceptance and knowledge conversion are shown below.

Table 5-1Similar variable in IT dimension, KM dimension, and Limitation and barriers in converting and sharing knowledge

IT dimension	KM dimension	Limitations and barriers in converting & sharing knowledge
/Age	None	/Age

/ Attitude about Technologies
// Perceived Ease of Use
// Perceived Usefulness
// Interface and Interaction
	/ Attitude about KM
	// Task
	// Belief
		/Attitude

/ Ability and Skill	/ People
	//Knowledge worker
	//Knowledge receiver
		None

/ Culture
// Organisation
// Background
	/ Culture
	// Background
		/Culture
		// Shy
		// Afraid

IT dimension	KM dimension	Limitations and barriers in converting & sharing knowledge

/ Management
// Top-down management
	/ Management
	// Management between KM job and main job
	// Responsibility
	/ Supporter
	// Leader
	// Government
		None

/ Policies	/ Policies	/Policies

/ Understanding	/ Understanding of KM concept
	//Definition and application in organisation
		/Understanding
		// Definition
		// Application

/ Behaviour (Tam theory)	/ Behaviours
	// Collaboration in organisation
	// Behaviours between CEO and employee
		/ Behaviours

None	/ Technologies
	// Database
	// Network
		/ Technology
		// Bandwidth

The Table 5-1 indicates that there are eight similar variables in both dimensions. They are:

1. Age
2. Attitude (technology and KM)
3. Human Factors (ability, skills, and people)
4. Culture (organisation and background)
5. Management (top-down management, supporter)
6. Policy (leaders, government)
7. Understanding (definition, application)
8. Behaviour (collaborations, behaviour between managers and employees).

As some thematic variables were not discovered, they will be discussed individually to elucidate their effects on the people in an organisation, IT under the technology acceptance model and KM implementation in the MOC.

5.2.1.1 The relationship of age and the human factors (ability, skills and people) with the level of technology acceptance

Even though the results did not indicate that age and the human factors are main issues influencing technology acceptance, these factors have been reported in several previous studies (AL-Hajri 2005; Kripanont 2007; Ojha 2005; Roca, Chiu & MartA˜nez 2006).

The interview results showed that only one respondent referred to the importance of age on the level of adoption and acceptance of technology. In the MOC, *age* probably affects the level of use of a new technology, such as MSN Messenger, websites and E-service, and knowledge-sharing activities. Some participants mentioned that younger people have a higher level of adoption and acceptance of technology. They have the ability to adapt to

new technology and are quick to learn through meetings or training on specific topics to enhance their abilities on a KM team.

Ojha (2005) and Riege (2005) found that *age* is a factor that can affect users' satisfaction when they have to share their knowledge with others. In the present study, the researcher found that increasing age affects the person's knowledge-sharing capability within an organisation. Moreover, if people within the same group have different age levels, age is the greatest barrier to knowledge sharing.

The relationship between *educational background* and knowledge sharing satisfaction are concordant in several aspects.

Ojha (2005) found that different education levels in an organisation affect knowledge sharing. This indicates that interaction decreases because of conflicts due to different ideas or misunderstandings. It creates a barrier of knowledge adjustment and knowledge sharing between people in the group.

However, Wang (2004) argued that knowledge sharing can be increased under this limitation by changing members' attitudes. Members have to realize that any knowledge they possess is valuable and should be shared with others to sustain the organisation.

The *ability and skill* of the new generation might influence the performance of an organisation. Some respondents mentioned that the new generation knows how to find new technologies to enhance their job performance and their communication ability. For example, IT teams always used MSN Messenger to share information although they were remote from each other. Moreover, they are able to share knowledge, motivate colleagues, and send important data via MSN Messenger technology. However, the abilities of all people to use new technologies could be improved by training activities. Using t*raining strategies*, the KM team understands that employee' skills have to improve; they provide various courses relating to the use of new technologies. Once again, the age factor seems to influence employees' abilities to improve their skills. Respondents reported that those from the older generation took more time to learn and change their attitudes than those of the new generation. In the TAM2 model (Venkatesh, V. & Davis 2000), Davis referred to

"experience" as one variable that influenced perceived usefulness and intention to use. The present study has not verified that ability and skill could have a direct impact on perceived usefulness and intention to use, but the researcher believes that it is quite likely that ability and skill is impacted by experience. Figure 5-1 shows TAM2 which consists of subjective norm, image, experience, voluntariness and cognitive instrumental processes such as job relevance, output quality and result demonstrability (Venkatesh, V. & Davis 2000).

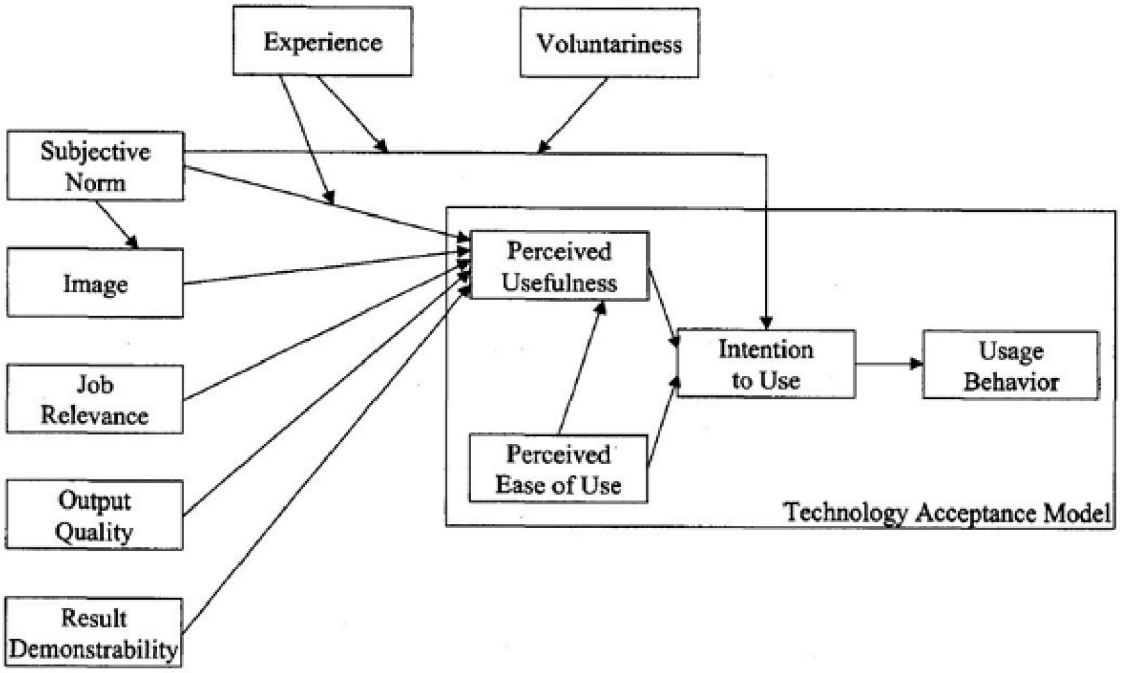

Figure 5-1 TAM2 proposed an extension of TAM, Venkatesh and Davis (2000)

Even employees who have undergone training and have always used technology can always increase their abilities, skills and experience. It might be said that improvement of abilities and skills increases one's experience level. These factors could be actively integrated into a training technique.

However, the *relationship between training courses and time* presents a problem at the MOC. The interviewees stated that when employees finish training courses before the technology is ready to use, they lose the opportunity to practise with that technology, and

by the time the technology is implemented, they are not able to use it effectively. This could be a cause of slow progress in the adoption of a technology and improvement competency at the MOC and is related to top management and policies.

Technologies are constantly used in an organisation for communication or to transfer information. However, the effectiveness of using technology to improve the knowledge conversion process depends on the *knowledge of the worker* and the *knowledge of the receiver* (Rodrigo Baroni de & Marta Araujo Tavares 2001).

The respondents reported that employees (knowledge workers and knowledge receivers) have not always used existing technologies to work parallel to the knowledge conversion process. It could be seen in the results that the KM team strongly suggests more techniques that could be used to enhance and promote knowledge management at the MOC rather than simply using effective technologies as the originators of important tools for knowledge management.

As previously mentioned, the techniques that are used to share and convert knowledge among people or groups are *Storytelling and COP*. These techniques promote an effective conversion process to make the transfer between tacit and explicit knowledge. It might have been that, in the past, the KM team, who planned strategies and activities to implement the knowledge management program at the MOC, were not interested in the benefits of technology or that they already understood the employees' abilities and skills to use technology to support the knowledge conversion process. These issues may be investigated in future research.

The relationship between the knowledge worker and the knowledge receiver influences the knowledge conversion process and level of technology acceptance. This issue might refer to the national background and organisational culture at the MOC. Previous studies have argued that different national backgrounds might present different results in similar topics or studies.

5.2.1.2 The national background of Thailand can be summarised with two key words: Phu yai and Phu noi.

This part will be discussed, as it influences the actions between knowledge workers and knowledge receivers, as indicated by the results of this study.

According to the simple lines of social rank defined by age, wealth and personal and political power, all relationships in Thai society are governed by connections between *Phu Yai* ('big' people) and *Phu Noi* ('little' people) (Officialthailandinfo 2007). There is an explanation in social status of Thailand regarding *Phu yai* and Phu *Noi* as described below.

"When meeting someone new, a Thai person will automatically make an assessment regarding their *Phu Yai* or *Phu Noi* status. They may ask quite probing questions in order to classify them. A set of mutual obligations requires *Phu Noi* to defer to *Phu Yai* through demonstrations of obedience and respect. In return, *Phu Yai* are required to care for and offer assistance to *Phu Noi* that they have ordinary contact with. *Phu Noi* may ask *Phu Yai* for favours, such as financial help or assistance securing employment. It would cause *Phu Yai* some loss of face to refuse these favours". (Ali's thaikitchen.com 2009)

For the communication dynamics among the Thai people, this issue has a direct impact on implementation of knowledge management programs and knowledge creation processes. If the knowledge worker was Phu Noi and the knowledge receiver Phu Yai, the process of creating a new knowledge process might face a great deal of resistance. This is because the knowledge worker might panic about how to transfer what they know to the knowledge receiver who is older. On the other hand, the knowledge receiver might easily accept the knowledge or information if he/she is a good learner and the information is useful to him/her. In contrast, if the knowledge receiver is a negative learner, he/she might ignore or not be interested in the information the younger knowledge worker (Phu noi) is trying to impart.

The conflict of social ranks has not been intensely investigated in this study; however, a study of the relationship between the different social levels in Thailand might have an impact on the knowledge creation process. This world make an interesting for future study.

5.2.1.3 The impact of management and policy on the level of acceptance of technology and knowledge conversion

Conflicts between management and policies regarding knowledge management programs were proposed in the results. The interview results suggested that employees feel there is a lack of top management support for technology in knowledge management programs at the MOC. Moreover, frequent changes in the organisation's management policies could have an effect on the development of knowledge management.

The lack of consistent policies probably relates to Thai political affairs. From early 2008 to mid- 2009, the internal political system of Thailand was extremely unstable.

Some respondents stated that *top management positions have changed* during the past 2 years and that this has had a direct impact on the MOC's policies. The top position at the MOC is related to political affairs. During the last 2 years, the Thai government has changed twice and top management positions at the MOC have also changed, especially, the position of "director general of a department". This study could not confirm that the two events are linked, but several interviewees remarked on this situation.

Even if MOC's policy of enacting the ICT master plan between 2008 and 2011 have not changed, the *individual visions* of each person in top management positions are quite different.

> *Person A responded, "Some people put the ICT strategy to be a main driver in the performance of organisation, some people look at the other*

keys such as Knowledge management so we have to understand and support the top-management policies of each person".

It could be seen that, when new people assumed the top management positions*, they had their own ideas or visions* that were quite different from those of the former management team. Therefore, the new department heads might be more receptive to supporting new policy.

This issue was related to employee practices, planning and solutions to enhance performance and points of organisation. The KM team argued that they had to study the objective of the knowledge management plan and the new strategies needed to create suitable directions for supporting employees' jobs. The KM team still followed the old strategies and previous policies. Therefore, the employee's jobs were affected by several forms of resistance, such as *departmental budgets* and *submission of plans for organisational development*.

Moreover, the impact of the lack of *supporting old strategies* influenced *employee's attitude and practices*. The interviewees argued that the non-support of old strategies by those in high management positions had a direct impact on KM implementation. The employee did not get enough motivated support when they had participation in "KM activity" or "KM day" such as rewards by the top manager. This probably caused a change in employees' attitudes about implementing KM programs, as the rewards were key motivators in enhancing the level of use of KM activities at the MOC. The respondents argued that the rewards were slightly decreased. The team that managed the KM activities did not have access to rewards to persuade employees to join them, so employees lost interest in the activities.

In addition, the *employee's practices* changed when the attitude and policy to support KM changed. It can be seen from the discussion above that a reward is a key motivator. An interviewee stated that the number of members on the KM website is slowly decreasing and the level of interest in using the Question and Answers on the discussion board on the

website is low. When comparing the website usage in 2007-2008 to the transcribed interview, the online discussion board was not a popular feature.

The KM and ICT teams created *the discussion board on the KM website* to be a centre for sharing ideas and knowledge within the organisation. The usage level of the discussion board was high in 2007. Employees posted several issues that related to employee welfare and KM usage pertaining to their jobs. However, the usage level of the discussion board slightly decreased in 2008 because the issues that employees posted on the website, such as how to improve employee's welfare and how to create effective KM in the organisation, were not supported. It might be said that using an online discussion board did not benefit the MOC's employees, so they lost interest in using it to practice and improve their knowledge and skills.

This example makes a good case for *changing the employees' behaviour in sharing knowledge*. The willingness to share knowledge in the workplace and to promote employees' behaviour in sharing knowledge in public places is difficult when employee motivation is low; it is important to correct the motivation problems quickly. The *website* was an important public tool for sharing and converting knowledge and information at the MOC.

5.2.1.4 Attitude, understanding and behaviour are important in the knowledge conversion process

The attitude of the employees and understanding of the concepts and practices affect their behaviour on acceptance of technology and the converting/sharing of knowledge.

Organisational improvement programs are successful when all employees have a good understanding of the common themes of the techniques and a good attitude in accepting those techniques.

Even though attitude and common understanding among MOC employees were mentioned by respondents in a negative manner, in that they were not impressed by KM activities and that their concept of knowledge management was not clear, the MOC still provided employees with common knowledge regarding KM in the workplace and rewarded those who supported internal activities to change employees' attitudes.

According to the findings of the study, a lack of understanding of the concept of knowledge management was the key issue that affected the knowledge conversion process and the intention to use technology to support knowledge sharing. Employees who were heads of KM activities in each sub-group had the best understanding of the concepts and were drivers in convincing members to participate in the KM program. Other employees, who were not members of the KM group, had a negative attitude about participating in KM programs. The results showed that non-members regarded KM activities as extra responsibility that could not benefit them but that KM implementation would be an essential goal as one of MOC's KPIs (key performance indicators) as established by the OPDC (Office of Public Sector Development Commission) of Thailand.

To achieve the goals of the organisation, most employees collaborated on the KM program so that they would receive some benefit, such as an individual or departmental bonus, MOC budget increase or an incremental salary increment increase. This might create both an advantage and a disadvantage for employee's behaviour and impact on employees' understanding.

Firstly, the advantage of controlling the employee's intention for collaboration in the KM implementation occurred simply in the organisation. The behaviour and understanding of employees was controlled by using motivation and a code of practice that helped them to effectively learn together. When everyone was required to learn the KM concept and complete the mission to achieve the mutual benefit of the organisation, the employees really performed and paid more attention to the practices necessary to achieve the goals. Learning and collaboration simply happened. However, this performance could not create the real attention and intention in themself and/or organisational culture because most

employees were controlled by un-refutable practice policy. For example, MOC noticed that every department had to achieve KM goals by creating at least seven KM topics per year as well as providing KM activities, such as COP. If the employee or department could successfully reach that objective, the organisation would give them a bonus or increase their budget.

This might be a deterrent for an employee to increase his/her skills and prevent them from gaining an in-depth understanding of other organisational development strategies. It was probably because of employees was not really willing to perform and would like to keep away from boring duty.

Secondly, the disadvantage to real intention to adopt technology in day to day activities in employee's attitude occurred in the organisation.

Because employees were not involved or did not participate in the improvement of their organisation, they did not understand the benefit or role of its development.

There are many models, theories and programs to enhance public official performance in The Thai public sector development programs. Various strategies from new public management could be the cause of practices not being accepted or confusion in practices.

When an employee does not have an actual aptitude to perform a task that is established by the organisation, they might have a negative attitude towards using the technology necessary to support knowledge sharing in the organisation. The results showed that one respondent had a negative attitude toward the KM implementation and reward system.

To execute knowledge management and to avoid KM implementation failure, it is important to change the organisation's culture, which will eventually change the individual, group or unit. This means that idea processes, behaviours, interaction between people and core values must all be changed.

Therefore, KM needs to be executed from every aspect simultaneously so that employees are able to understand everything from in-depth information to complicated networks.

Since KM execution is a thing that will be inserted into routine assignment and people who will work on this, they are in the organisation as well those people who are different in belief, idea and behaviour.

Therefore, to make KM a concrete concept, it is very important to incorporate many strategies that can be adjusted or adapted to suit the capabilities of the people in the organisation, as much as possible.

Several organisations have attempted to investigate effective techniques to improve their employee capabilities. The MOC is also concerned about this issue.

Different generations in an organisation might have an impact on technology acceptance. The interviewees on the ICT team stated that the ability to use technology is divided between the new and the old generation. The new generation consists of young people or people who can easily adapt to new technologies within their job; while the old generation is defined as older people who do not need to adopt technology. From MOC's internal survey, most employees are of the old generation. They have difficultly using technology because their job does not require it. Normally, documents and typing are used in their daily communication. Therefore, when senior officers would like to apply new technologies or new strategies, such as E-service or E-paper, older employees might not be keen on accepting them and even resistant to the change.

However, training approaches have been applied to extend employees' abilities and skills. The MOC provides several training courses, such as software computer courses and KM courses, in order to reduce any resistance in employees' attitudes.

5.2.1.5 Thai organisational culture influences the intensity of technology acceptance and the knowledge conversion process

Cameron and Quinn (2006) stated that "modifying organisational culture is a key to reach the success of competitive advantage in the business world". This study suggests possible ways to develop the MOC's organisational culture. The discussion in this topic will focus on solutions to change MOC's organisational culture and suitable ways for solving problems.

The discussion on solutions to change MOC's organisational culture can be conducted by:

1. Showing results from the interview on the attitude of the organisational culture and the relative problems
2. Presenting some suggestions from interviewees.

Firstly, the results showed that organisational culture (OC) has an impact on the development and acceptance of technologies and KM implementation at the MOC. According to information from literature on business management and human resource development, OC plays a key role in organisational development (Brown, AD & Brown 1995; Huczynski & Buchanan 2001). Huczynski and Buchanon (2001) defined OC as a collection of relatively uniform and enduring values, beliefs, traditional customs and practices that are shared by members of an organisation. This definition clearly explains the objective of the collective nature of culture and refers to the ideas and behaviours of the existing culture in an organisation.

To be effective, modern organisations attempt to find solutions for bringing new creative technologies or proper procedures into their organisations. Barriers, environment, and methodologies that might affect the progress of adoption in an organisation, have been

critically used in several ways. However, the key for crossing these barriers is a good understanding of the internal perspective of the organisation.

The results of this study show that OC is related to several variables:

1. OC with learning ability
2. OC with expression ability
3. OC with achievement orientation
4. OC with old practices.

Table 5-2 the relationship between OC and the attitude of the MOC's culture

Relationship between OC and variables	**Attitudes and classifying cultures**
1. OC with learning ability	/ Behaviour of technology usage: Thai people do not often use technology (person E) / Opinion : No new ideas or think something different (person G) / Advantage of record: Most people believe that while talking with others you cannot note or write during the conversation (person H).
2. OC with expression ability	/Organisation behaviour does not like to talk to each other (person B) /Most people have no expression between colleagues (person B) /Shy (person D)

Relationship between OC and variables	Attitudes and classifying cultures
	/Be afraid that they will have done something wrong (person D) /No new ideas or think something different (person G) /Be afraid that they will have done something wrong (person G) / No expression (person H)
3. OC with achievement orientation	/ Thai people do not often use technology (person E) /Lack of belief (person E) / No attitude about sharing knowledge (person F, J) /Most people believe that while talking with others you cannot note or write during the conversation (person H).
4. OC with old practices	/Thai culture (always respond CEO's policies) (person A, J) /Most people believe that extra jobs are not their task (person I)

5.2.1.4.1. Organisational Culture(OC) with learning ability

It can be observed from the results of this study that learning ability, expression ability, achievement orientation and operation and command were the most critical key factors that

affected the innovativeness of the MOC. The results support an argument of a past study (Zuber-Skerritt 2002) that learning ability is a major motivating factor for an organisation to innovate. Chaharbaghi and Newman (1996) stated that learning organisations have strong reviewing skills and high acceptance of doubt and are able to take risk during an innovation process. In fact, as stated by some of the participants of this study, they are not responsible for the computer programming and course training designs, but simply provide the attitudes according to the requirements of their members. However, it may be the result of the learning initiatives. Therefore, in order to strengthen the competitive advantage of organisations, management teams need to change their employees' attitudes towards learning.

Interviewees stated that the attitude of their organisation's culture in terms of learning ability, behaviour of technology use, stating an opinion differently or similarly, and the ability of taking notes or themes after conversation are the most significant problems in their OC.

- **Behaviour of technology usage**

Although behaviour toward technology use in some developing countries has slightly improved, reticence still remains in Asian countries. It can be seen from the tables below (Table 5-3) that, because of the lower middle income in Asian countries, there is a low rate of PC penetration and Internet users (World Bank 2005). The rate of Internet users might indicate the behaviour of technology usage in Thailand, although it does not evaluate the behaviour of technology usage in Thai public organisations.

Table 5-3 No. of computers in lower middle income and high income countries

Country	No.of computer per 100 population
Lower middle income	
China	4.9
Indonesia	1.5
Philippines	5.3
Thailand	7
High income	
Korea, Rep	53.4
New Zealand	50.2
Source: World Bank, 2005	

Although this information on Table 5-3 is over 4 years old, more up to date information is not available and it is likely that the number have not changed much.

However, the low rate of computer ownership in some countries is a matter of serious concern at the moment. It is evident from the transcribed interviews that the MOC does not have enough computers for all employees, even if the interviewee feels that he/she has enough technology.

> *"...We try to give a computer to our employees as one by one in ICT department but other departments we not sure, they might not have enough computers for everyone... " Person A.*

The number of computers in lower middle income and high income countries (World Bank 2005) and the number of Internet users in lower middle income and high income countries indicate that the rate of computer use in Thailand is still lower than other developing countries. There are many people who do not know what a computer is or how to access the benefits of a computer to increase job performance (searching for data via the Internet). In fact, development of IT projects in the Thai public sector began in the early 1990s and the master plan for the first national IT project was made in1996 (Durongkaveroj 1995). In over 20 years of promoting IT for the Thai nation, the Thai people have not had the opportunity to learn modern technologies as in other developing countries. If the level of computer use in Thailand increases slowly, the deployment of IT services, especially, the

ICT master plan that involves the public government's services, might not be implemented by 2010.

To enhance the use of computers or IT at the MOC, those who make the decisions regarding the ICT plan should focus on providing the appropriate number of computers in the workplace and increasing the level of IT knowledge for all employees throughout the organisation. This study understands the organisation's limited computer-buying budget; however, the organisation needs to learn more about the benefits of IT and how to adapt it into their strategies for enhancing services. These are important issues for building a future-ready enterprise and for ensuring that the organisation and the human resource department are ready to take action according to the National ICT 2010 and the ICT master plan.

In conclusion, this study did not examine the relationship by quantitative methods as a statistical evaluation; the results of the interviews indicate only what people actually think about the existing problems in the MOC. For future research, a study using quantitative research methods could identify the real number of computers used at the MOC. This might benefit the analysis of data that relates to the behaviour of computer use in various workplaces. Moreover, the level of knowledge based in IT could be considered, such as Internet use (searching information), communication services (Email, sharing data on the network, video conferencing) and the use of internal services (websites, blogs, online discussion boards).The Thai government will be providing E-government services in 2010. Employee knowledge and the number of computers available to those employees will be very important to the next generation.

- **Opinion and taking advantage of record**

In the Thai culture, differences of opinion are not usually openly expressed during meetings. This issue was referred to by person G. The participant believed that new ideas or expressing individual ideas in meetings does not often happen in Thai society. Most people

are afraid or too shy to offer opinions. For example, in Communication Practice activity between departments, there are no exchanges of ideas or disagreements between people. Thus, exchange or sharing of knowledge in a group is not effective. In traditional workplace contexts, where people work together, feelings often influence the people who interact with each other. Bizman and Yinon (2004) argued that a positive exchange of ideas and information can occur when people are open and cooperate in a group. Hoegl and Gemuenden (2001) also supported the concept that workplace collaboration is important. Therefore, Thai organisational culture should consider an increase in the exchange of information and ideas in the workplace to effect a positive impact on the willingness to share knowledge within organisations and raise the general morale of the work atmosphere (Samarah 2006).

The advantage of recoding the attitude of the Thai people might be related to enhanced knowledge conversion in the Thai MOC. Knowledge conversion is the process of changing natural knowledge for tacit knowledge and explicit knowledge. The inherent knowledge inside of a person (tacit knowledge) needs to be elicited and converted into an explicit format. This can be done in several ways, such as taking notes in a meeting or using a tape recorder or digital recorder during a conversation. Because this is a simple step in knowledge conversion, if people do not understand the advantages of note taking or using recording methods, the process of knowledge conversion in the workplace might not happen effectively. The writing process indicates that it is an important communication in the continuum of communication between tacit and explicit knowledge (Lehaney et al. 2004). Taylor (1998) suggested that "people will be the biggest factor in determining the success or failure of knowledge management by the quality of their decision".

5.2.1.4.2. Organisational Culture (OC) with expression ability

The characteristic of this organisation culture is very much resisted in Thai organisations. The expression of Thai people might be limited by their culture as discussed above in the meanings of Phu Yai and Phu Noi.

The activities of the Thai people always defer to tradition. It can be seen from the results that, in Thailand, organisational behaviour inhibits employees from talking to their colleagues (person B).

Thai organisational behaviour evolves from two emotions: shyness and fear. People who are Phu Noi might always feel shy when they would like to express new ideas to Phu Yai because Phu Noi believe that Phu Yai have more experience. The expression ability in Thai people might be limited at this point. Some people believe that their ideas would provide erroneous information or affect the profit of their organisation. Moreover, it could be said that *be afraid to do something wrong* is one barrier to sharing knowledge in Thai organisational culture. Concern for making a mistake in the workplace or presenting a wrong idea might be a significant issue for Phu Noi, as it might affect his/her job position. Therefore, Thai people need to change these attitudes to access the new organisation knowledge base of the future. For example, people in a higher position should support employees' ideas by giving them opportunities to present their ideas to colleagues or to share their knowledge in explicit formats, as it is beneficial to everyone to learn new information from each other.

Even if there are different social levels, western cultures have greater expression abilities than eastern cultures.

5.2.1.4.3. Organisational Culture (OC) with achievement orientation

This issue entails four main aspects: the Thai people's behaviour toward the use of technology, their lack of belief, attitude toward sharing knowledge within an organisation and their reticence to record information during conversations.

Firstly, the *Thai people's behaviour toward the use of technology* in organisations is considered at a low level. The attitudes of the KM team (Refer to Table 4-8: Status of KM) indicated that the level of technology use was low. They argued that the background of Thailand does not relate to the history or culture of technology, even though there are benefits of technology in modern businesses or international organisations. In general, the Thai working process is locked into the old traditional culture. The mostly older employees in Thai public organisations are familiar with traditional documents, the use of the typewriter, hand writing and keeping and sending hard copy documents for security. These systems were used for quite a while in Thai organisations, so that changes to the system and the use of modern technologies, such as computers, might be difficult to grasp. However, when organisations could no longer deny the benefits of modern technologies, most older employees felt inadequate in the learning of the new technologies. This might be because they see the technology as difficult to understand.

In conclusion, basic cultural resistance may be an important factor that affects the level of technology use in Thailand.

Lack of belief is another relative issue that involves behaviour and attitude. One interviewee pointed out that Thai people have a lack of belief in the benefits of using technology in the workplace.

The interview showed that there were factors that might impact on technology acceptance such as perceived ease of use, age and top down management (Table 4-3). Moreover, problems of knowledge management such as attitude about KM task and belief (Table 4-5) might represent as a problem in "Lack of belief" in MOC's organisation.

Many previous studies regarding belief/trust, which impact the use of technology, have shown that it has affected the perceived use of technologies on a nationwide scale (Adams & Wiswell 2008; Gefen, D., Karahanna & Straub 2003; McKnight 2005).

To show the importance of trust in employees , Chrobot-Mason (2003) reported that when trust in employees was high, they might have less feeling of suspicion of the organisation.

The recurring problem in the MOC's KM was that employees may not trust on benefit from KM, or see advantages of using technology and have a negative attitude to sharing knowledge. Therefore, the development or enhancing of knowledge management strategies would be hard to achieve in MOC. The interview results showed some attitudes of using new technology and organisational culture at below.

> *"Older people or older groups look at the new technology as a hard task but when they used it for a while, they change attitude..." Person C*

> *"I believe that, in the first period, IT is not necessary for people to share knowledge but when they talk to each other frequently until they know how to share knowledge to the others naturally. IT will play an important role in managing knowledge... However, the role of IT is not obviously seen at the moment..." Person J*

> *"Our organisation culture can be explained as a "terrified to express an opinion" culture and it also included "rarely sharing their knowledge" culture..." person I*

In addition*, Attitude toward sharing knowledge within an organisation was* found as a serious problem in the MOC's organisational culture. The interview indicated that KM practices were seen as an extra duty and not a job-responsibility. However, some interviewees presented ideas on making trust and how to change people's attitude as shown below:

> "*Making a trust, this is a very hard practice. People have to show significantly an own effort in job task for example, "if people do not wish*

to do KM activities, I will work and do not care them to show other people as a KM model and KM worker" This will be firstly shown but it has to depend on what people wish to do or do not wish to do..." *Person E*

From the above statement, it could probably be said that the employee believed that use of modern technology was a difficult task and the role of technology to support knowledge sharing and knowledge management could not yet be arrived at while they did not have a good experience to share knowledge. Interestingly, behaviour, trust and attitude of employees may have an impact on organisational practices and exist in Thai organisational culture. Therefore, the behaviour, trust and attitude of Thai employees regarding technology usage combined with other strategies such as knowledge management strategy in the organisation might be considered as a topic for future research.

However, to improve this problem, the author believes that a manager or head office may play an important role in managing or re-aligning employee attitudes by:

1. Supporting employees by giving them new information about IT that provides benefits for their job.

2. Supporting training courses to improve skills in using new IT such as Microsoft office, Internet and VDO conference.

3. Supporting knowledge management, such as knowledge sharing in the workplace, using a COP and storytelling in effective ways, within the organisation.

To create new belief and confidence, the organisation must take the time to change their employees' attitudes. Strategies and policies that support the people in the organisation must be implemented. However, cost and attitude of the employee might be two resisting factors in any organisation.

Reticence of employees to record information during conversations was an interesting topic. This looks to be like a similar issue with "*taking advantage of record*" in the

previous section (Organisational Culture (OC) with learning ability). The researcher will not repeat the discussion for this issue.

5.2.1.4.4. Organisational Culture (OC) with old practices

Social factors were of vital importance in explaining the operation, and line of command with employee practices. There are some conservative issues in organisational culture and employees practices.

1. Operation (following CEO's policies, fear of the policy) and
2. Individual responsibility in a public organisation (conscious of the work).

Normally, a Thai public officer always respects those in a higher position, such as the director. Following instructions of the executive's policies is the principle in Thai society. When the policy development of an organisation has been launched by the executives, it is natural that all employees must follow.

This principle has remained in Thai culture and in every Thai organisation. Conflicts with those in authority never occur in Thai organisations.

Therefore, most employees try to follow instructions and support policies, which are sometimes frequently changed, even if they are in disagreement with those policies. Some participants in the study indicated that it is good idea to follow the policies and try to achieve the set strategy, even if, in practice, it would conflict with their general work. They like to adhere to the policies so as not to worry about their duty or position.

In addition, a variety of policies inconsistent with existing policy affect the development of an organisation. The MOC has developed strategies, visions and plans to enhance its level of organisational performance. Many policies involve modern complex strategies used in international organisations or successful companies, such as creating an ICT department, use of knowledge management strategies, and creating various activities to support

organisational learning. However, there are no tools or indicators to show whether their organisation is suited for those strategies. Efforts to bring useful tools into an organisation are admirable but if they lack adequate study or the advice of experts on particular matters, it makes their development very exhausting. Moreover, new plans that support the existing plan should be considered carefully. Using the old tools or adapting the old strategies might prevent the creation of negative attitudes in existing employees.

While supporting executive managers' policies, all employees attempted to find out the most suitable practices and to adapt behaviours to follow those policies although they were not happy to deal with that.

Some employees never really intend to follow the policies and have a negative attitude to any organisational development strategies. For example, the KM program and IT support have been used in organisations to develop employee abilities and the performance of the organisation. When people do not accept the strategies, the organisation meets with a great deal of resistance in changing people's attitudes and behaviours.

The interviewees suggested that the MOC (Ministry of Commerce) should:

1. Understand what employees really need to develop their performance,
2. Study, create, and design programs that suit the organisational culture, and
3. Relate new strategies and policies to previous structures and also apply follow up to the performance of tasks that have been provided.

Individual responsibilities in the workplace have not been sustainably created in Thai public organisations. Policies and strategies that have been presented to employees have not really been accepted by the organisations themselves. The lack of collaboration between individuals in the workplace results in negative attitudes, which occur in employees regarding existing and extra tasks.

For example, one interviewee stated that, while each department had approximately 30 employees, there were only 5-10 people who were KM members and organised any extra KM jobs, such as managing COP, organising storytelling and motivating colleagues. It might be said that most people do not want to take on an extra KM job with their existing tasks because they only want to work hard on their daily jobs and think that it is an unnecessary duty.

In conclusion, the general practices of employees relating to organisational policies might also relate to each other. This may have had some effect on technology usage in the organisation and creating a negative attitude to use of strategic development plans such as duty of knowledge management, knowledge conversion, and knowledge sharing. Factors that could result in slow organisational development in Thai culture are learning ability, expression ability, achievement orientation and old practices. All of these variables might impact on the acceptance of technology and knowledge management implementation in Thailand's MOC. This study indicates that several problems that occur in Thai organisational culture need to be focused on carefully, because the next generation of Thai government services will be E-Government (Electronic government), which is ready and will be developed in 2010. Before this service is provided in Thailand, old attitudes need to be overcome.

5.2.2 Different variables

Different variables that relate to the acceptance of technology and knowledge conversion in the Thai MOC will be discussed below.

The different variables in this study could probably represent direct and indirect impacts on the Technology Acceptance Model (TAM) and the knowledge conversion process in Thai public organisation.

First, the study demonstrates the IT variables that might be a key limitation in the acceptance of new technologies in the MOC. Secondly, other relationships, in terms of the

KM dimension, are discussed as they relate to the limitation of knowledge management in Thai public organisations.

Table 5-4 The different variables of both dimensions

IT dimension	KM dimension
/Securities	/Activities in KM practice // Topic and Activities
	/ Costs and expenditures
	/ Strategies

	/ Training and communication
	// Course training
	// Communication procedure

5.2.2.1. The acceptance of technology under security issues

Security or safety in the workplace refers to any responsibilities that would affect a current position and/or future work. It must be concretely defined that any new technologies or electronic strategies (such as E-signature, E-paper) must be secure.

The respondents stated that they were ready to use the new technologies, but that the technologies must be reliable and safe. This issue was discussed within the MOC's E-services as *securities level in_command method* at MOC high position.

For example, the respondents referred to the behaviour and acceptance of new command systems, such as E-signature. Actually, the commander was familiar with documenting procedures, such as approving an employee holiday permit, approving the policies and

strategies to develop internal organisations and approving other important documents in official use.

1. People avoid the use of E-sign because they have no confidence in the security system. They worry that the system may be hacked into or that someone can copy e-signatures without permission.

2. People perform duplicate processes. They work on the E-document and the hard copy document.

3. Problems with waiting and delayed processes. The E-document is a fast service, but employees have to wait for the document to start doing and proving something.

5.2.2.2. Costs and expenditures

To perform KM activities, an organisation needs to have expenditure and financial support, including rewards that can be used to encourage staff to join in on the activities. However, the reward should be funded by the administrator. Thus, cost is one of the issues that need to be considered in which it could effect the developing organisation and motivating staff to mutual activities.

5.2.2.3. Training program and communication

As a rule, Thai organisations still lack good training courses regarding knowledge conversion between individuals in the workplace. To coach people, those who are knowledge workers need to be trained in communication skills.

An interviewee proposed that:

1. Good knowledge conversion is an upshot to good learning. However, the knowledge worker needs to have the ability to communicate and transform knowledge to others. If they lack communication skills, then the process of knowledge conversion cannot be completed or applied effectively.

2. The communication training program and knowledge conversion in the organisation is created and adapted by applying to the knowledge worker initially then to those people involved in performance to transform knowledge in others within the organisation properly.

5.2.2.4. Strategies and activities to persuade people

From the interview results, it is demonstrated that the topics that the participants are concerned about and pay attention to are KM and anything else that directly affects the staff, including the benefits that the staff might receive or lose. From the interview chapter, it was shown that MOC staff benefit from sharing their knowledge on the Webboard, as detailed below:

Person B mentioned that

> *"The main activity on the website in 2007 was the question and answer (Webboard) section, which was very popular. We also provided COP activities through the Webboard. However, in 2008 those activities were less interesting."*

Person B said that the main reason that MOC staff became interested in the Webboard was KM topics, such as *"what kind of benefits should MOC staff receive?"* This topic was very interesting for the staff at first, but this topic is no longer interesting because the staff felt that the organisation did not react or reply to the comments that they provided.

Although, this topic does not show the staff's knowledge increasing, it is a starting point to show that Webboard is a way to receive comments or opinions from the staff, and is another channel to exchange knowledge and opinions and to increase staff interest in technology.

Moreover, providing interesting discussion topics is an important strategy to entice the staff to participate in the activity. Interview data presented that the MOC introduced a discussion topic on welfare issues on the Webboard in order to encourage the staff to participate in the community in 2008. During that time, this topic could bring the employees' attention to discuss and show ideas on the Webboard. However, the number of employees who participated in the Webboard discussion decreased after that because they believed that no one was concerned with their opinions and there were no changes in welfare issues. Therefore, the issues about welfare and benefit which affect employee directly might be the important issue and the main factor to make staff reveal or give their opinions and share their knowledge with others.

Therefore, the KM team should pay close attention to this. Some interviewees mentioned

> *"the reason that people are not interested is because the KM topic and KM activity are not interesting, sometimes it is boring because the question is ordinary. Moreover, employees feel that the motivation to persuade people to join the KM activities was not interesting because the KM team always provides the same rewards and unattractive activities. KM activities were exciting at first, but became boring later" Person A.*

It probably seems that a reward can greatly influence and attract the staff's concern or interest in KM initially, but the staff will eventually become bored of the activity after it is repeated multiple times.

The researcher provides some comments on this. It is a specific operation that depends on the KM team's ability to determine the best topic or strategy to attract the staff, and also to convince or lead them to use the technology. The use of computers and the Webboard allows staff to participate and provide comments that they might not have otherwise been able to or that they might not have felt comfortable doing face to face. As a result, this might be an important factor that they must use in the KM development of MOC.

5.3 Discussion on Research question 2:

"*Which technologies have been used with the knowledge conversion processes (SECI) in Thai public organisations?"*

The findings from the interview results show that employees have a lack of understanding of SECI concepts and how to apply the SECI process for sharing knowledge in a group. Although employees were trained in the concepts of KM and the SECI process to increase the level of sharing and knowledge conversion, the level of understanding was still low.

It can be seen from the results that most people think the KM adoption status is under 50% and more time is required to achieve success in KM. Moreover, the other factor which related to a basic understanding of KM concepts has been presented in the result chapter (problems of KM in the organisation).

This section presents the technologies that have been used to convert knowledge by the SECI process. To clarify how these technologies work as a tool of KM or a converter of knowledge, the main discussion is divided into four sections: 1) S – Socialization 2) E – Externalization, 3) C – Combination and 4) I – Internalisation. Explanations and suggestions are included in each section.

5.3.1. Socialization

Socialisation is the process of transferring tacit knowledge to tacit knowledge. This process happens by human communication such as face to face communication. The people involved can transfer their own knowledge to others with/without technology support (Nonaka, I. & Takeuchi 1995; Nonaka, Ikujiro, Toyama & Konno 2000).

The results showed that most interviewees believe that they are very close to achieving this process, as it is simply communication and frequently practiced in any organisation.

The technologies used in the socialisation process at the MOC consisted of 1) MSN Messenger, 2) Telephone, 3) VDO conference and 4) Networks (internet and intranet).

In some groups at the MOC, MSN Messenger was used as an online communication tool via the internet. The ICT team stated that they used it within small groups and with people who knew how to Email each other. There are several benefits to using MSN Messenger for communication in the workplace. For example, employees on the ICT team used it to chat and share knowledge with each other.

Moreover, the ICT team used MSN Messenger as an information and message sender. Files, such as pictures, documents, music and videos, were sent through MSN Messenger. However, this study did not ask about the utilisation of MSN Messenger in daily life because there are many features in MSN Messenger, such as VDO call, phone call and so on. Interviewees argued that official files could be delivered through local Email. MSN Messenger was used to chat and send any unimportant files. However, they mainly used MSN Messenger to chat rather than send files.

"Why do people use MSN Messenger as a portal of communication and to share knowledge and information?" This question emerged after the interview because MSN Messenger is a new technology and it is not actually used much in the office environment. The relationship between the benefits of MSN Messenger and the process of socialisation might be explained by several issues, discussed below.

5.3.1.1. Acceptance of MSN Messenger: A probable effect of increase in knowledge sharing and converting

Nonaka defined socialization as a process through which humans exchange common knowledge (tacit) with each other by social interaction. This process can be witnessed in many organisational events such as subdivision meetings or a conversation between friends. However, technology can be used to increase efficiency of this process. This is one of the several reasons for using MSN Messenger in an organisation. First, it is a well-known technology that most employees are comfortable using. Second, it is a technology that is specifically designed for communication via the Internet, a highly convenient medium for

the users. Lastly, it conforms to the perceived usefulness and ease of use proposed in TAM, given that MSN Messenger is very easy to learn and understand, and also useful in many respects. For example, it can be used for video conferencing or even as a tool to send and receive files.

In this positive relationship between MSN Messenger and socialization, MSN Messenger is the tool that enables effective knowledge transfer and conversion. It also reduces problems or limitations arising from Thai customs and organisational cultures.

5.3.1.2. MSN Messenger can probably overcome the limitations in Thai organisational culture

As shown in the study, the organisational culture in Thailand poses problems in knowledge sharing among employees. However, the use MSN Messenger as a communication tool can reduce problems associated with expressing an idea, such as shyness. It can also reduce organisational culture problems related to learning ability, expression ability, and achievement orientation.

The first step towards reducing challenges associated with learning ability is to use easy and user-friendly communication software such as MSN Messenger. The people of Thailand have experienced many difficulties in using English communication software; however, MSN Messenger has been designed as a tool that facilitates easy communication among people through its simple and user-friendly interface. Hence, most people within an organisation can quickly learn to use this system. Thus, MSN Messenger can introduce positive changes in people's behaviour towards the use technology within a Thai organisation.

Secondly, MSN Messenger can improve expression ability within the Thai organisational culture. MSN Messenger can solve some these problems by helping colleagues express their ideas freely, without feelings of fear or shyness.

Finally, MSN Messenger can probably help the Thai organisational culture by changing people's attitude towards knowledge sharing and recording behaviour and beliefs. This study found that in the Thai culture, people are wary of sharing their knowledge and experience because they believe that by sharing their knowledge, they will lose their advantage. This is an important deterrent to knowledge sharing among Thai people. In fact, they do not even approve of or allow others to take notes during a conversation because the content might prove to be useful later. However, MSN Messenger technology can help record information during a conversation and thus introduce a change in people's willingness to share their knowledge with others. Moreover, the beautiful interface design and attractive features such as video conferencing and file sharing may induce a member of the senior staff or a person who is not technology savvy to consider MSN Messenger technology and other such technology-enabled communication tools in the future**.**

5.3.1.3. MSN Messenger can support knowledge sharing within an organisation by offering employees a chance to use new technology

Researchers agree that MSN Messenger is an interesting technology to communicate, nowadays. Using it can benefit an organisation in many ways. Firstly, it presents an opportunity for the people in the organisation to use existing technology to communicate with each other, and also expands the knowledge-sharing methods. Secondly, although it cannot be immediately seen, using his technology can lead to the achievement of organisational goals. It is a good starting point for employees to familiarize themselves with new technology. It conforms to national policy guidelines on ICT, 2010, transforming organisations sharing and learning centres and promoting a knowledge-based economy, which is a main policy objective of the Thai government.

5.3.1.4. MSN Messenger benefits the knowledge conversion process in many respects

Knowledge and data transferred through MSN Messenger helps not only the socialization process but also the knowledge conversion processes (SECI) such as externalization, combination, and internalization. Communication via the computer offers the added advantage of storage in an electronic version. During a conversation, knowledge from a person gets immediately converted from tacit to explicit because of the typing process.

Knowledge thus shared between people can be automatically stored on the computer, enabling users to retrieve the necessary information at a later date. Besides, knowledge transfer from an explicit form to another explicit form (combination process) can be achieved instantly by sending data (electronic) from one knowledge worker to another through the MSN Messenger file sharing feature, eliminating the need for externalization. This process is simple and time-saving. A knowledge receiver can then convert the knowledge that has been sent in explicit form into his own knowledge, through the process of internalization.

Although MSN Messenger is a major communication tool within organisations and an effective tool for knowledge transfer and knowledge conversion, the lack of security during knowledge transfer limits its use.

Researchers agree that perception of usefulness and ease of use are two significant variables that MOC organisations consider before incorporating MSN Messenger technology within the organisation. Lack of security during data transfer is a major technology-related concern in a government organisation. The author of this paper agrees with the opinions of an interviewee that classified or important data should not be exchanged via MSN Messenger. Classified information should be transferred through other types of communication channels such as E-mail or phone calls.

5.3.2. Externalisation

Externalisation is a process that converts tacit knowledge into explicit knowledge. Technology these days is the key to achieve effective conversion. It plays an important role in transmitting and converting tacit knowledge into explicit knowledge (Nonaka, Ikujiro, Toyama & Konno 2000). Once tacit knowledge is converted into explicit, it can be shared with others. In this study, the results show there are 3 intelligent tools—MSN Messenger, website, and Email—that are probably the most interesting for people to use within an organisation.

However, it can be seen from the results that these key tools are not effectively used by either the ICT team or the KM team. The discussion is presented below.

5.3.2.1. The problem of different generations and backgrounds in IT

This study found differences among people in a unit in terms of attitude, age, education, experience, background, personality or characteristics leads to differences in the knowledge creation process. Unlike the KM team, ICT is an efficient unit that uses technology to increase their knowledge. Because the ICT team is younger, the team members have a positive attitude toward using technology. Moreover, their knowledge of IT is more than that of the KM team. Therefore, it is easy for them to adopt new technology that may be complex than the KM team members who have limited IT knowledge and not a very positive attitude toward technology. As a result, the KM continues to survive on basic knowledge and manages its work with help of documents. Knowledge sharing through COP or story telling techniques involves distribution in paper format or using basic technology such as telephone. Although Email and Internet can be for these tasks, only a minority of people use them. This study was not a survey on the number of people who use ICT, therefore, it is difficult to identify the exact number of people who use ICT in each unit. However, the interviews revealed people's opinions on technology were based on their attitude and working standard as well as those of the group. The author found that young staff with IT knowledge were eager to seek and learn new technology and use it on the job.

This staff recognized IT to be an important contributor in converting normal knowledge to explicit knowledge. They believed in tools such as MSN Messenger to communicate with others in the workplace in order to save time and cost and for its benefits in converting knowledge into other formats easily and quickly.

5.3.2.2. ICT support helps organisations adopt more international practices

The policies of the MOC have to be changed significantly, and new technology plays an important role in introducing positive changes in the field of knowledge management. However, this raises a few concerns for the KM team that might not be able to adjust itself to the new technology because of its complexity. It is essential for these people to learn and accept new technology. Although there are many ways to develop externalization processes, for an organisation to grow according to international standards, it needs to constantly develop basic knowledge on IT. Moreover, to build new knowledge and conversion formats that transmit intrinsic or tacit knowledge on to the technology platform, organisations should pay attention to developing technology in the future, ensuring that the organisational culture is not a factor that prevents development. This trend is evident in the advancements in Internet communication, website, and software communication (such as MSN Messenger, Yahoo Messenger, and Google chat).

Finally, it seems that the ICT team is more open to using complex technology tools than the KM team. MSN Messenger, website and Email are the future of communication and knowledge transformation in this organisation.

While the ICT team is familiar with these technologies, the KM team may resist MSN Messenger because of the members' limited technological skills and knowledge.

5.3.3. Combination

Nonaka (2000) states that, in the knowledge creation process, technologies need to work like transformers and collectors. The important role of information technology can be seen in this process. This is because explicit knowledge, such as documents or files in a database, has already been converted from the critical processes (e.g., discussions and meetings). These explicit knowledge forms are easily changed, formulated and transferred into different locations by technological supports, such as computers and mobiles.

By focusing on technology use in the MOC, this study found that the ICT team used complex technological software more than the KM team. For example, technological communication software, such as MSN Messenger or VDO conference, were widely used by the ICT team, while the KM team used only common technologies, such as computers, the internet, Email, telephone and fax. However, this is probably because the common knowledge that related to IT usage to support tasks was limited in the KM team members. The author of this study would like to recommend future research to look at two important issues 1) the individual experience of the use of technology and 2) the intention to use new technology under a particular group study. Several factors of Thai organisational culture could probably be important factors to develop and use IT in the KM team. However, the portal to transport explicit knowledge to other platforms was to communicate via the website. On the website, via intranet/internet protocol, there were many activities that allowed all MOC employees to communicate and exchange and deliver explicit knowledge to others. The online discussion board was a popular tool that the ICT team made available to employees. It proved more useful for discussions on individual topics or to transfer electronic data to colleagues. However, the website was not limited only to local communication. It was possible for people who work in rural areas to share data as well. The study could not provide quantitative data on how many people entered the website or how much data was delivered via the online discussion board; however, the interview with the ICT and KM teams indicated that all employees intended to use online discussion to communicate with each other. It was useful within the knowledge management program to enhance the sharing and converting of knowledge at the MOC.

Online communication seemed to be the most effective communication tool in the MOC. This study did not mention the level of internet and intranet use in the organisation because these technologies are quite common and are already used in every organisation. This study aims to determine the existing environment problems and the tools that can transfer knowledge, data and information via the network.

5.3.4. Internalisation

Because of the broad concepts of knowledge, the internalisation process, supporting the knowledge conversion process can seem quite complex.

According to Nonaka and Takeuchi (1995), internalisation is "the process of adding to explicit knowledge (principles, procedures, and methodologies) new tacit knowledge (in the form of sensations, memories, and images) by experimenting in various ways, including real life experiences, simulation of limited situations, or simulation through the usage of software."

The internalisation process can occur through several ways that involve **learning by doing**. In a way, internalisation is the conversion of explicit knowledge into tacit knowledge, and it is important for the knowledge creation process because people can learn new knowledge which will become their own knowledge.

Explicit knowledge can be analyzed and changed to tacit knowledge with self- learning techniques. Explicit knowledge will once again become intrinsic when a person acquires knowledge from sources such as textbooks, journals, and operation manuals. Although the person will become an expert and be able to share his or her knowledge with others, he or she still need to learn more and acquire much more knowledge. Moreover, he or she will need to use this knowledge for performing regular tasks to gain expertise and transform general knowledge to personal knowledge.

Technology has become an important tool in this process. As mentioned earlier, computer software can help a knowledge worker transform tacit knowledge in to explicit knowledge and also help a knowledge receiver gain new knowledge.

For example, Microsoft Office software such as Word, Excel, PowerPoint, can help people create explicit knowledge. As acknowledged in the literature review, this knowledge can be stored, edited, and forwarded to others easily with the help of supporting communication technologies, such as file sharing via e-mail or MSN Messenger.

Knowledge is an asset that can offer benefits to people. They can learn and receive knowledge directly from the source; however, it is important to convince or coach people into internalizing the knowledge they receive such that it can be used for working or sharing with others. For this, they need to start by embedding knowledge into themselves first. That is, they have to identify and understand existing explicit knowledge. Then, they have to use this knowledge regularly to solve problems. This process needs to be performed continuously and acquiring expertise may take a long time. The outcome of this process is that explicit knowledge will become a person's knowledge and be embedded into their minds.

There are three mechanisms through which ICTs can support knowledge internalisation. Firstly, ICT uses online manuals and courses that replace traditional paper formats and face-to-face modes. Secondly, they enable the exact simulation of the organisational process through the workflow system; step by step guidance for individual activities provides continuous assistance for development of specific tasks and reduces mistakes. This continuously available online assistance enables employees to acquire and internalise the explicit knowledge associated with organisational routines and /or design rules, which supports the development of a unique organisational culture. Finally, ICT support guides experimentation through tutorials on virtual design tools, allowing faster, more profound, and often more complete internalization of critical design knowledge, especially when compared with traditional processes.

The results of the interviews show that the internalization process with technology support in MOC has not been addressed previously. Building of new knowledge or knowledge management can suffer if an organisation excessively focuses on converting tacit knowledge into explicit (externalization process) and ignores opportunities to increase the skill and knowledge of the staff. Staff or people in the organisation are very important as expert staff members can share or distribute new knowledge to others in the future.

Finally, the author believes that internalization is very important because it will enable the staff to enhance and develop their skill and potential. They do not need face-to-face communication with experts because it may not help in an emergency situation. In other words, they can immediately attend to an urgent problem without the aid of an advisor. People have to learn to try to solve a problem by using the document, which is provided to them as explicit knowledge, as a guideline. This will save time and lead to instant solutions. Moreover, staff members can gain practice in real-life situations until they acquire expertise and are able to teach others. This process can increase the potential of the socialization process. If staff members obtain new knowledge and practice frequently, the organisation will have more knowledgeable workers, helping the organisation achieve efficiency. On the other hand, if an organisation does not pay attention to the internalization process, the number of knowledgeable workers will not increase, leading to delays in resolving problems as face-to-face communication would be necessary.

However, the MOC is using COP and storytelling strategies to develop knowledge management within organisations. The author believes this is a good opportunity for organisations to change the knowledge management process. Although some processes do not impact the main function of the MOC, this is an initial stage for knowledge exchange among people in the organisation. Members of the organisation will know each other better despite working in different teams. For knowledge creation processes, it is not necessary to follow a sequential order from socialization to externalization and combination to internalization because these processes can occur during different events and at different places.

5.4 Discussion on Research question 3:

"Does the sharing of knowledge in Thai public organisations increase after improvements in the knowledge conversion process?"

This study cannot say that the sharing of knowledge in Thai public organisations has increased rapidly or decreased dramatically. As the results show, further recommendations through an analysis of the qualitative data on problems that occurred in the sample group could be expected to show that the level of sharing of knowledge and behaviour of use of technology to support knowledge management in the organisation might increase after the organisation has concerned itself will all issues and considered positive ways to improve their strategic management in the future.

Data from the interview suggested that the Ministry of Commerce (MOC) was attempting to adapt its existing technologies and communication methods to help implement Knowledge Management (KM) in the organisation. The organisation attempts to use new technology with their KM strategy, but it is likely that the KM status in the MOC still stands at the beginning level. The competences of employees were such that they only understood the basic concept of knowledge management and learnt new knowledge by using the provided activities within their organisation. For example, Internet technology, is used as a media centre to distribute and share knowledge with staff and also includes an E-learning system that is used as a learning tool to share knowledge with the staff. Both of these are systems that are broadly used in modern organisations.

From the interview results, particularly regarding the question about the status of KM in MOC, the researcher believed that the KM level of the MOC is low; it could even be called entry-level management skills in KM implementation. The organisation attempts to use and has begun to learn about KM tools such as using COP and Storytelling. These are a good starting point because both of these tools give staff a chance to discuss and exchange knowledge. The organisation could use them broadly and effectively in every part of the

organisation because both processes are the beginning of new knowledge creation and are effective tools in knowledge conversion processes as well.

At first, MOC must use knowledge sharing through face to face communication, which is part of the Socialisation (converting process from Tacit to Tacit knowledge) method. This method might fit with the organisation because MOC is just beginning to transform its organisational culture. Therefore, this might be an opportunity for the employee to share their comments regarding opinion to improve knowledge sharing and present a good practice in KM implementation with others. The researcher also concluded that to develop knowledge conversion in MOC and make it much more efficient in the future, MOC should attempt to introduce KM activities, including building an organisational culture to change an old knowledge sharing culture and to improve the behaviour of using KM tools to expose their own knowledge and information such as use COP and Storytelling activities in the organisation.

There are several reasons to support the development of a knowledge conversion process and to enhance knowledge sharing in the organisation by use COP and Storytelling, including:

1. COP and Storytelling are activities that allow people in the organisation to share their ideas or comments. They provide the staff with an opportunity to share and discuss different topics. This might be a good process to change a negative organisational culture in Thailand, such as no expression in the workplace, no new ideas and so on (refer to Tables 4–7).

2. COP and Storytelling activities are in line with the knowledge conversion process (SECI).

    2.1. COP and Storytelling activities are a good starting point to enable knowledge creation and transfer. The implementation of the process of Socialisation and Externalisation also get a benefit from these tools. This research demonstrated that

most of MOC's staff normally share knowledge through a face to face communication method because it is a convenient way. Sometimes they introduce a new technology for communication between the employees, such as MSN Messenger. Moreover, some problems can be resolved using these activities such as the sharing of knowledge or ideas between employees through the use of COP and Storytelling. COP and Storytelling allow the organisation to build or renovate their organisational knowledge by exchanging people knowledge and leaning new knowledge. For example, some employees can provide a useful story to colleagues that they can implement in their work through Storytelling activity.

2.2. Combination and Internalisation processes can work effectively when staff are expert in implementation through obtaining knowledge from COP and Storytelling. Both of these processes will be more efficient when the employees are ready to share or broadcast their knowledge to others because the organisation creates a knowledge environment (COP and Storytelling) that supports knowledge conversion process. However, before Combination and Internalisation processes can occur at MOC, they must be supported by technological tools and a responsible person or an appropriate plan, such as the creation of a database system to store knowledge.

According to Table 4-10, the opinions and attitudes of employees from interview data regarding technology needs and general support in the topic of how implementations of KM will be successful can be summarised as follows:

1. A database system is required in order to gather knowledge and information during sharing knowledge.
2. The use of MSN Messenger communicates with others as a software online communication to work in groups.
3. Present a variety of KM tools to make an opportunity in sharing knowledge.

4. The improvement of effective training online and techniques of transferring knowledge.

From the statements above, the results of research question three can be summarised that Knowledge sharing in MOC will change and might be developed to be more efficient in the future. The reasons to support this statement can be summarised as follows:

1. Strategic planning of organisation regarding knowledge management indicated that MOC are concerned and pay attention to development of knowledge sharing and would like to be a learning organisation.

2. The knowledge management practices used suitable techniques to support knowledge conversion process. Use of effective KM tools such as COP and storytelling could help the organisation sharing and managing knowledge well.

3. Technology support was used to help the explain knowledge conversion process in the MOC. The effort of creation of a communication technology to use in organisation was a good start. The MOC provided Webboard as an online discussion board to support employees' knowledge sharing and information exchange in the workplace.

Even if the organisation does not have a knowledge management system such as a KM database or KM software, this researcher believes that the future of knowledge sharing and knowledge conversion process in the MOC will work well.

5.5 Discussion on Research question 4:

"Does the technology acceptance model help explain the Knowledge conversion process in Thai public organisations?"

The TAM focuses on the usability of IT by studying perceptions and values. TAM is used for determining the relationship between human needs and other technological factors such as computer, telephone, and computer software. However, TAM can be used to explain the

relationship between technology and the knowledge management process because technology is an important factor that is accepted by many organisations around the world. These organisations also use technology in conjunction with knowledge management strategies. Currently, IT has attracted increased attention because of its use in the KM system. Many people believed that knowledge management programs can test the ability of IT to mix and adapt with policy or action plans of knowledge management initiatives systematically. IT is an efficiency tool that can manage people's knowledge or tacit knowledge and other knowledge which is known as explicit knowledge. Explicit knowledge referred to as external knowledge exists in the organisation. Dougherty (1999) stated that many processes are used in knowledge management, and IT is essential to accomplish these processes.

Moreover, IT is a tool used to store explicit information and to coordinate among people. Nonaka stated that IT was becoming increasingly important in converting, delivering, and storing knowledge in the system.

TAM offers a basis to determine people's technology perceptions with the help of two main factors: comfort and ease of use and user benefit**.** However, both of these can be influenced by other factors such as age, gender, and culture. The sample group showed that problems between IT users' attitudes and the KM team surface when they have to work together. This study aims to explain the real problems and presents information that may be specific to the sampling group.

With regard to the knowledge conversion process referred to in TAM theory, there are a few limitations in using technology for the knowledge conversion process in MOC.

5.5.1. TAM theory may not be useful for MOC if people still lack support from other sources

There are some factors such as ease of use, and usefulness in TAM that mean probably that MOC cannot influence technology usage level among MOC people because:

1. People lack inspiration to use new technology because the head office or a supervisor does not support them and does not reinforce them because there are some factors such as policies, motivation, and practices.

    1.1. As shown, policies and supervisors can help their subordinates use technology. They can also play as important role in an organisation by influencing its people. Therefore, if a supervisor does not support the technology or if an organisation changes its leader frequently, it can adversely impact the performance of strategic planning. This exercise will waste time because the strategic team will have to change and initiate new development plans to support new policy every time.

    1.2. This study also found that to inspire people to use technology and help them concentrate on their assignments, organisations have to establish strong policy measures that are aligned with existing operations, even if the executives will be changed. Moreover, the project manager in charge of strategic planning will have to talk to the executives and convince them of the advantages and disadvantages of using technology. This will help the team to work continuously and will not affect the main policy established in the past. The next benefit is changing staff members' ideas and attitudes toward technology because there will be no bias and conflict in the organisation. Although the study presents the researcher's opinion and recommendations to solve the problem, the study of the problem between unstable policies and performance might be of interest and will be researched in the future especially in Social Science and Humanise.

2. Some people are not interested in technology because they think that it is a waste of their time to attend technology training classes and it may not be related to their current job.

    2.1 By surveying the staff about training programs, the researcher found that some of the training programs arranged to enhance staff's potential were not as good or did not align with operation timing. It appeared that the staff could not use the knowledge obtained from training. A reason might be that the organisation takes a long time for technology execution such as finding a budget for technology purchase.

    2.2 A preliminary recommendation for training program development in MOC is preparation of an appropriate time management schedule that aligns with the existing technology and policy, in order to ensure that everything is ready for everyone to execute their tasks immediately. This helps poor staff performance stemming from knowledge lost after the training session. However, this is not an in-depth study. Further investigation on the source of the problem and its factors should be undertaken in the future.

3. People do not pay attention to technology. Staff's knowledge and competency is a probable barrier to development. Moreover, some people cannot find technology that is suited to their jobs or that can be adapted with KM strategic planning (1. bring no efficiency outsources to come to work in the organisation 2. Staff lack knowledge and are not developed 3. People do not have ability to share their knowledge with others.

    An additional recommendation is that organisations should not use outsourcing practices such as hiring an outsider to plan the organisation's knowledge management initiatives and its use of technology to enhance the staff's potential. Doing this can raise give rise to several disadvantages and problems as follows:

3.1 An outsider will not know the organisational culture of MOC because he or she cannot spend his or her time working with people in MOC. Thus, outsiders will not be able to identify the real problem. To solve this issue, the researcher suggests that MOC should build their own potential team to learn their organisational culture, and this team should work closely with other teams such as the KM team and the ICT team. This will benefit people who are in the same organisation and find themselves with similar problems. Solutions to such problems require in-depth information that an outsider may take a long time to study.

3.2 Another problem that prevents the organisation from using technology to increase its knowledge is the lack of an advisor who can suggest measures for using and managing technology. This is a problem arising from a no-outsource employment policy. The author suggests that this problem can be solved by providing appropriate technology for knowledge management, knowledge sharing, and knowledge increasing designed by the people of MOC. Systems can be developed by the ICT team or through collaboration between the ICT team and the KM team. A major problem for the MOC is that if an outsource contract expires and the organisation does not extend the contract, any technology designed by the outsource firm will have to be discontinued.

The problem of outsourcing may be a critically important aspect in the MOC, Carmen Weigelt (2009) stated that " Outsourcing plays an important role for firms adopting new technologies. Although outsourcing provides access to a new technology, it does not guarantee that a firm can subsequently integrate the technology with existing business processes and leverage it in the market place."

Weigelt found that outsourcing had an impact on knowledge management and know-how of people in organisations. This is because if organisations have a reliance on the ability

and performance of outsourcing, the organisation could easily lose the own benefits such as learning by doing, internal investment and tacit knowledge applications (Weigelt 2009).

Furthermore, the negative effect of outsourcing could happen in the organisation if they do not have enough experience in prior related technology and understanding of technology related to the organisations' internal processes (Brusoni, Prencipe & Pavitt 2001; Forman 2005).

From the opinion above and results of interviews, it could be said that the MOC might meet the problem of reliance on outsourcing and communication between needs of organisation and outsources. Therefore, the MOC should pay attention carefully to this topic because the organisation may meet the further problems in the future such as a lower level of learning by doing in the organisation, loss of interval investment (people, asset and knowledge), and the problem of knowledge management application (Tacit knowledge application and etc.).

5.6 Summary

This chapter has discussed several possibilities to find out a suitable answer for the research questions. It included several topics which concerned knowledge management implementation and the technology acceptance model. This chapter also gave some suggestions to be a guide for organisational development. Moreover, this chapter also developed the model framework to show the finding key which related to or effected the knowledge conversion process and technology acceptance model. Most findings could have an effect on organisational performance such as job performance, employee behaviour and level of knowledge sharing and knowledge conversion in organisation.

In examining the knowledge conversion process in the Ministry of Commerce Thailand, the study found some external variables that related to technology acceptances and knowledge conversion processes. The study can conclude the answers from key research questions of this study as below:

- Research question 1 concluded that there were two groups of external variables which had an impact on technology acceptance by improving knowledge conversion process in the Ministry of Commerce Thailand.

  The first groups were similar variables which illustrated both an IT dimension and a KM dimension (from the interview result). They consisted of seven main factors as show below:

  1. Human factors: Age, educational background, ability and skill.
  2. Training Strategies and Training period and Knowledge worker.
  3. National background of Thailand: Phu yai and Phu noi.
  4. Management and Policies: top management position, visions and ideas of each person in top management positions, lack of supporting between old strategies and new strategies, and employee's practices.
  5. Attitude, understanding and behavior of employee.
  6. Thai organisational culture (OC): organisational culture with learning ability, organisational culture with expression ability, organisational culture with achievement orientation, and organisational culture with old practices.
  7. Number of computers and IT support.

  The second group contained different variables which illustrated the IT dimension and KM dimension. They consisted of four main factors as show below:

  1) Security issues, 2) Cost and Expense. 3) Training program and communication, 4) Strategies and activities to persuade people.

In summary, Figure 5-2 presents the modified outcome that impact on technology acceptance and knowledge conversion processes in MOC Thailand.

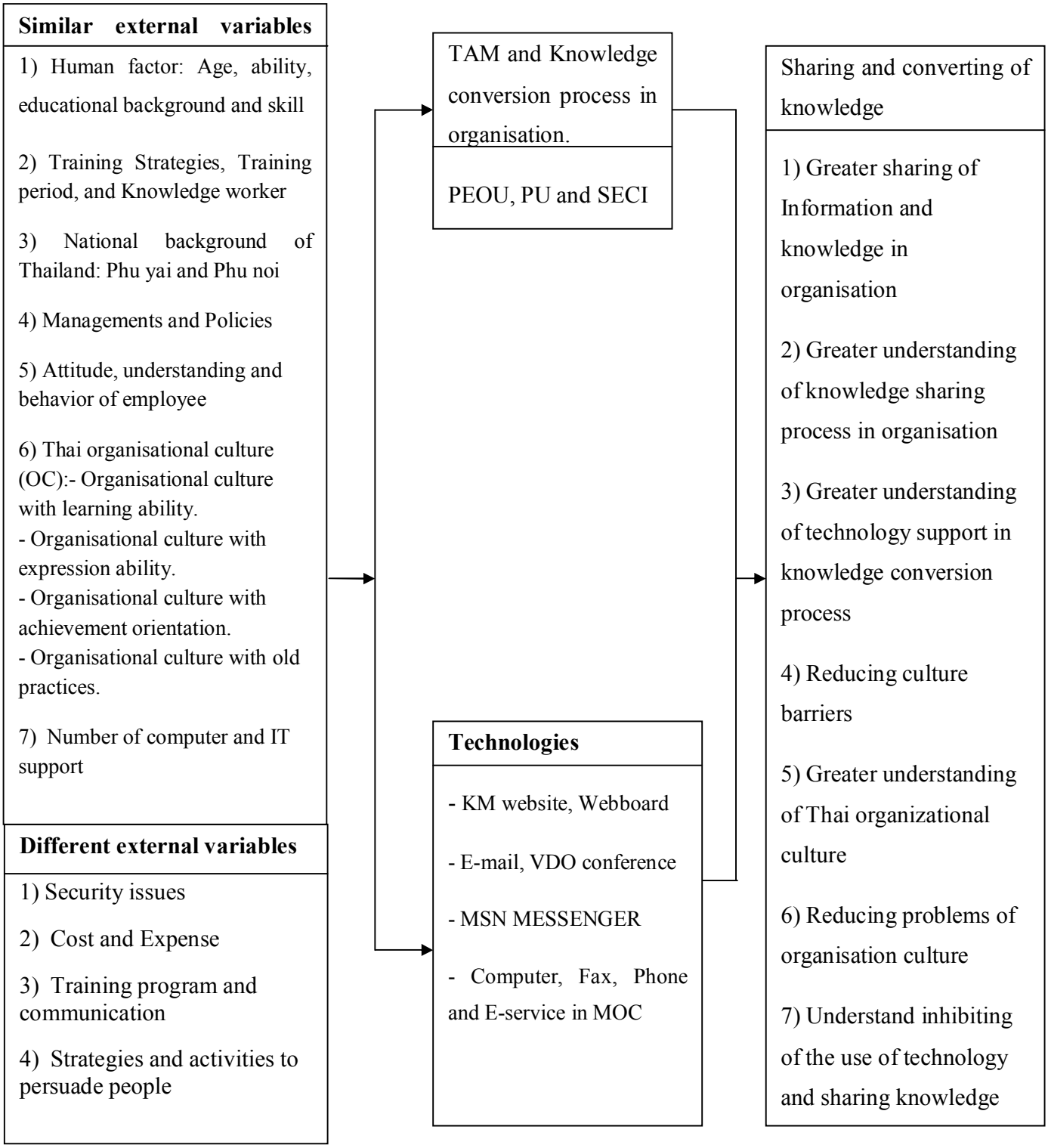

Figure 5-2 The modified outcome that impact on technology acceptance and knowledge conversion process in MOC Thailand.

- Research question 2 concluded that there are different information technologies which have been used with the knowledge conversion process (SECI) in the public organisation. The answers of research question two were divided into four sections to describe the important of use of technologies in MOC's SECI process.

  1. Socialization

  The technologies used in the socialization process at the MOC consist of 1) MSN Messenger, 2) Telephone, 3) VDO conference and 4) Network (Internet and Intranet). However, the MSN Messenger is likely to present as the popular technology and communication in ICT team and it was not actually used much in the office environment. Therefore, the issue of MSN Messenger was discussed in four sections and included:

  1.1 acceptance of MSN Messenger: A probable effect of increase in knowledge sharing and converting.

  1.2 MSN Messenger can probably overcome the limitation in Thai organisational culture.

  1.3 MSN Messenger can support knowledge sharing within an organisation by offering employees a change to use new technology.

  1.4 MSN Messenger benefits the knowledge conversion process in many respects.

  In the conclusion of use MSN Messenger issues, the researcher argued that perception of usefulness and ease of use were two significant variables that the MOC considered before incorporating MSN Messenger within the organisation. However, the security system was an important topic in using MSN Messenger in the organisation.

  2. Externalisation

  In the externalisation process, there were three intelligent tools that were probably the most interesting for people to use within the organisation. They included MSN

Messenger, Website including Webboard (Question and Answers), and Email. However, E-learning, manuals and documents were used as the techniques to help employees improve knowledge.

This section also discussed the problem of using ICT in effective ways. These were divided into 2 topics.

1) The problem of different generations and background in IT.

2) ICT support helps organisations adopt more international practices.

3. Combination

By focusing on technology use in the MOC, it was seen as likely that use of online discussion board (Webboard: Question and Answers) on the KM website in MOC was a popular tool to communicate, exchange and deliver explicit knowledge to others. The concept of combination in the SECI process was described in the previous section. It defined the process of conversion between explicit to explicit knowledge forms. In this process, the technology such as the computer, website and files in a database was seen as technological supports to transfer knowledge, data and information in the organisation.

4. Internalisation

Website, Webboard and E-learning on Website were used in the internalisation process at the MOC. The discussion shows the opinions about use of technology involved with learning by doing of employees. The MOC used online service such as online manuals and courses to enable all employees to acquire and internalise the explicit knowledge. Using the online service could help employees to increase their tacit knowledge and could immediately attend to an urgent problem without the aid of an advisor.

- Research question 3 could be answered by considering that knowledge sharing in the MOC will be changed and might be developed to be more efficient in the future.

The reason that it could be believed that the MOC's knowledge sharing might increase is 1) knowledge management strategy plans of the organisation provided techniques and technologies to support knowledge sharing, 2) The knowledge management practices used suitable techniques to support knowledge conversion processes such as COP and Storytelling, 3) Technology support was used to help explain knowledge conversion process in the MOC such as Webboard.

- Research question 4 concluded that the technology acceptance model could broadly help explain the knowledge conversion process in Thai public organisations. This could explain why the MOC used many technologies in conjunction with its knowledge management strategy and that technologies were essential to accomplish this strategy. Additionally, IT had an impact on people's work and knowledge conversion processes. The result of interviews showed that there were some similar variables and some different variables in IT and KM dimensions, and limitations and barriers in converting and sharing knowledge. Moreover, the argument, discussion examples in several sections of this study could probably show that the TAM and knowledge conversion process had a wide relevance in several issues.

  The author noticed that the narrower relationship between technology and knowledge conversion processes should be investigated and studied more in future research as this project only discovered the variable information and general relationship in knowledge conversion processes and technology acceptance in the MOC. However, this study suggested that the TAM might not be useful for the MOC if people still lack support from other sources such as supporting policies and plans of organisation, supporting knowledge management programs (such as the problem of training programs), supporting the workplace and technology (such as problems from the outsources and supporting technology in the workplace).

6. CONCLUSION

6.1 Introduction

This study was conducted to better understand how information and communication technology could assist in the process of knowledge conversion in a Thai Public organisation. The research required the identification of the key factors for implementation of knowledge conversion process based in organisations by using the technology acceptance model. In addition, the findings of this research are important as they will allow the Thai public sector to make a better plan and direct their limited resources to the most beneficial areas in knowledge management implementation and technology support.

From the analysis and discussion, the study has found the external variables in both sides: the IT and KM sides, that impact on the Technology acceptance model and knowledge conversion process. These consisted of:

1. Age, ability educational background and skill (Human factors)
2. Training strategies, Training period
3. Techniques and tools to persuade people
4. Knowledge person (knowledge worker and knowledge receiver)
5. National background, Thai culture and Thai organisational culture
6. Attitude, understanding and behaviour of employee
7. Management and Policies, KM program, fluctuation in management position, motivation and attention from head office
8. Number of computers and IT support (supporting the work place, supporting knowledge management programs, supporting policies and plan of organisation, and security issues).

These have been discussed and related to the real state of affairs in the MOC organisation, particularly on the matter of the IT team as a supporter of the ICT team, and the KM team as the planner and analyser of knowledge management programs.

A benefit of this study will be that the MOC organisation or other Thai public organisations could take the results and critical issues to investigate the main parts of the knowledge management initiatives in their own organisation. This study could provide a good guideline regarding attention to the benefits of ICT tools to enhance or support knowledge management strategies, and demonstrate the actual problems (technology acceptance and knowledge conversion practices) in Thai public organisations as Thai people are the main workers in these organisations.

In addition, these findings will allow government policy makers and planners to make effective service planning decisions to support government policy direction such as Electronic-government.

Finally, this chapter summarises the research questions, provides an overview of the research, presents the key findings, proposes practical implications and identifies the limitations of this research. It also makes suggestions for further research and offers some concluding comments.

6.2 Thesis Questions

The purpose of this research was based on a study in knowledge management, knowledge sharing, and Technological support in organisations based on the Technology Acceptance Model (TAM).

In particular, the objectives of this study were to:

- Identify the external variables that have an affect on technology acceptance in organisations.

- Survey technology usage related to knowledge conversion processes in a Thai public organisation.
- Identify the main problems inhibiting the use of technology to convert knowledge in a Thai public organisation.
- Determine ways to enhance knowledge sharing in a Thai public organisation.
- Reduce barriers to knowledge conversion processes in Thai public organisations by using information and communication technology and external variables.
- Increase the performance of knowledge conversion in Thai public organisations.

The key enablers and major barriers identified by this study were a major contribution to the body of knowledge in knowledge management in Thai public organisations. The research questions have been investigated, analysed and discussed in terms of knowledge conversion and technology acceptance in Ministry of Commerce Thailand.

The research questions were:

1. Which external variables have an impact on technology acceptance in Thai public organisations by improving or reducing the knowledge conversion processes?

2. Which technologies have been used with knowledge conversion processes (SECI) in Thai public organisations?

3. Does the sharing of knowledge in Thai public organisations increase after improvements in the knowledge conversion process?

4. Does the Technology Acceptance Model help explain the knowledge conversion process in Thai public organisations?

6.3 Overview of the research

Chapter 1 – Introduction began with background and essence of this study. It suggested matters and motives that became an inspiration to do the research on applying the knowledge management and technology acceptance model to the Thai public organisations.

Chapter 2 – Literature Review was the review of literature used in this study. It introduced background, definition and information obtained from researching, which contained information on:

1. Knowledge Management (KM), Knowledge sharing
2. Type of Knowledge (Tacit and Explicit), Knowledge Conversion process
3. Benefit of ICT to support knowledge management process
4. TAM Theory
5. Problems and resistance on Knowledge Management
6. Knowledge management was mentioned on public and private organisations.
7. The information from literature was applied and referred to in all parts of this thesis. It was used to create validity and reliability of the research.

Chapter 3- Methodology introduced the procedure used in this thesis which was a qualitative research procedure. An Interview method was used in this study. This chapter described how sampling and data from Thai government organisations was collected; listed the question of the thesis, and the process went through to find out the appropriate conclusion of the thesis. Moreover, it also described the reliability and validity instruments, limitations and ethical issues concerning the research question.

Chapter 4 – Data Analysis and Result of the study described the results obtained from using qualitative research techniques. For data analysis, there were lots of topics that have been brought up to consider such as the problems of knowledge management, and technology usage involved in the knowledge conversion process, Benefits of ICT were discussed as were opinions on use of technology concerning knowledge management and TAM.

Chapter 5- Discussion have introduced problems occurred from doing this study and groups of results from the research questions. Moreover it provides recommendations on the scope of the research, knowledge management, knowledge conversion, acceptation of technology concerning knowledge management in an organisation. Each part of this chapter also describes the possibility of the future research that might be interesting for another researcher in the same area to do the further research and provide suggestions to enhance knowledge management practice in an organisation.

Chapter 6- Conclusion has restated what the thesis has studied and investigated. It provides a summary of findings in research, the practical implications of the research, limitations of the research, suggestions for future research, and recommendations.

6.4 Key findings

The study shows that there are many variables that could slow the development of the knowledge management initiative in an MOC organisation. The findings of this research can contribute to an organisation or a research field that aims to understand the limitations imposed by the Thai public organisational culture and other factors on acceptance of technology. The research showed that the following factors influence acceptance of technology, intention to use technology, and level of practice in knowledge sharing and knowledge conversion process in a Thai public organisation:

Age, ability, educational background and skill of an employee in each department are still key factors in IT scope and knowledge management issues.

- Suitable training strategies to increase the attention of employees and an appropriate period of training to improve people's performance should be considered for effective human development and savings on the state budget.

- Techniques and tools such as COP and storytelling (appeared in MOC) in knowledge management can be used in knowledge conversion processes for eliciting tacit knowledge residing with people. Moreover, strategies and activities to persuade people are found as an important factor in enhancing knowledge management strategies.

- A knowledge worker and knowledge receiver will directly impact the knowledge conversion process as they are the main players in knowledge management process. The organisational objectives will be achieved by improving their abilities and creating the suitable ways to change attitudes from negative to positive.

- The national background of Thailand, Thai culture, and Thai organisational culture were found clearly to have influenced the behaviour of the Thai people. Moreover, Thai organisational culture was explained in four groups: organisational culture with learning ability, organisational culture with expression ability, organisational culture with achievement orientation, and organisational culture with old practices.

- Policies, motivation, directives from the head office, and changing management can adversely affect people's attitude towards technology usage, knowledge sharing, and knowledge conversion. An employee can be limited in his or her own ability and sometimes because of lack of intention to act according to the policies. Participation of a leader can make an organisation fresh and alive because healthy participation between employees and leaders can strengthen their relationship, bringing them closer to the organisational goal. If the management is stable, the policy can continue without any changes. The development of an employee's ability, investigation of previously faulty practices, and analysis for identifying suitable directions for the organisation are clearly more effective.

- The important of attitude of employees and understanding of the concepts and practices of knowledge management scheme have an impact of employee behaviour on acceptance of technology and the converting/ sharing of knowledge.

- Computer and IT support indicators such as number of employees using computers in the workplace, use of ICT that was compatible with knowledge management programs, use of ICT that supported policies, and organisational plans of are importance for modern management. An organisation will not meet its objectives if it lacks adequate support. Most international and national organisations invest substantially in the use of ICT to enhance employee performance and support their organisational strategies. Therefore, sufficient computer usage and adopting ICT suitable to the strategies are key factors for the success of an MOC organisation.

- Security in ICT usage acts as a deterrent. Information security is essential in every Thai public organisation. This can affect intention to use technology because people are always worried about security when exchanging information through technology-enabled media at the workplace.

6.5 Contribution of the study

This study contributed to knowledge by developing a model to promote good transformation of knowledge to create the greatest value in Thai public organisations.

The study also contributed to knowledge of technology usage and the conversion of existing knowledge process by applying the Technology Acceptance Model (TAM) (Davis 1989) to explain uptake and use of this technology. The study investigated the external variables which impacted on efficient sharing and conversion of knowledge by human and organisational communication in the Thai public sector.

The study used two approaches: firstly to demonstrate technological infrastructure used to increase knowledge conversion processes efficiently in the Thai public sector, and secondly, to provide knowledge about the way knowledge sharing could best be implemented in organisations.

6.6 Practical Implications of the Research

This study will benefit the MOC, and other Ministries in Thailand because

1. Indirectly, MOC could use this study as a guide line for identifying the weak points in the organisation regarding KM implementation, barriers from organisational culture, and limitations in ICT and human ability for work, and attitudes of knowledge worker and people who are in KM team practices. People in the KM team can have a better understanding of limitations of the organisation to find a solution. Some examples are given below:

   1.1. The ability of older employees to use the technology: this can improve by offering suitable training such as computer training and giving information about ICT and promoting a positive attitude about the advantage of use IT to reduce job tasks.

   1.2. Attention of head office: This can be improved by making a better understanding in an important role and good support of head office that influence on the organisational strategies implementation and good practices regarding responsibility and function of KM decision maker.

2. In overall image, the implementation of KM and use of IT inside Thai public organisations has been promoted more during the last three to four years. Specifically, all Ministry of Thailand have to adapt themselves in order to be learning organisations in the future. A knowledge based economy is important in the Thai National plan, area KM was put in every part of Thai public organisations.

There were many departments that were established to manage knowledge and information in organisations. Therefore, all Ministries of Thailand can use this study as a case study for investigating knowledge conversion processes and learning about the inhibitors and enablers for knowledge management in Thai public organisations. They can discover and evaluate themselves and also compare the existing external variables that have impact on KM initialisation in the first stage of proclaimed policies. Then, they can look at an adoption of modern technologies and communications in the workplace for enhancing an effective knowledge management process.

3. KM departments that have been established during the past two to three years in many Ministries of Thailand or that will be established in the future in many agencies can prepare themselves regarding the problems and limitations after using KM strategies in public organisations. During this research, there have been KM departments established in several areas, for example, the Ministry of Justice Thailand have established a KM Centre to work in managing knowledge and creating knowledge for enhancing job performance such as managing lawsuit(searching and correcting), organising best practice in organisations for prosecuting attorney and providing general knowledge to Thai people. This study can benefit them to improve the KM plan and help organisation across the barrier of knowledge creation processes (SECI) in the organisation and managing existing knowledge. Furthermore, KM team can study the outcome from this research to create an effective KM implementation and KM master plan. This study is an important key that will work with the KM plan and present the real problems in Thai public organisations and Thai operation systems and it is likely that other Ministries in Thailand and other Thai agencies will benefit from these findings.

6.7 Limitations of the research

Significantly, this research studied Knowledge management in the public sector, knowledge conversion process in organisations, use of modern technologies including Information and communication technology (ICT) to support knowledge conversion process, and use of the Technology Acceptance Model (TAM). The methodology was also designed to study the particular topics and sampling group. However, there are several limitations present in this study.

1. This study is a single case study. Therefore, the case of this study was limited to a particular group. The study only focused on public organisations located in Thailand so the results might not be relevant to other private sectors or other countries.

2. This study attempted to discover the existing problems in the area of knowledge management implementation, knowledge conversion process, and use of technology in Thai public organisations. Therefore, there were several external variables which intervened and the study could not limit the external variables that occurred in this research. Moreover, this research had a limited time to find the external variables and real problems in organisation so some relationships in each variable cannot be explained in the study.

3. The MOC is a Thai public sector organisation that is an early user of the knowledge management strategies to improve organisational performances. Thus, the benefit of this study might be limited to organisations that are in the entry-level to intermediate-level in use of knowledge management strategies. This could be taken as limited evidence for a guideline in using knowledge management with supporting technologies to convert knowledge in an organisation.

4. Limitation of number and source of sampling group. In this study, the sampling method used the employees who have a direct responsibility and an important role in knowledge management activities, knowledge management strategic planning, and technological support in the MOC. Therefore, the number of the sampling group was limited to small size. The opinions and attitudes regarding this study are limited to these groups only. Other employees were not included in this research.

6.8 Suggestions of Further research

This study cannot explain clearly the relationship between variables of TAM theory and the knowledge conversion process (SECI) in the organisation. However, this study might serve as a beginning of other relevant studies on the solution to knowledge management problems in the organisation, and the use of new technology to support knowledge management.

Firstly, study of relationship between variables of TAM and the formation of a knowledge management system (KMS) in public and private organisations. It has been suggested by the researcher that future research may be conducted by applying TAM theory to find matters affecting the development of KMS in different organisations. This can be done by taking interesting variables from past research and this research altogether and apply them to the production of KMS for each organisation. The advantage of using TAM are that the researcher may suggest that the KMS system developer may understand any problems that occurred in their work, and also guide a direction to improve the attraction of users, and attract the organisation officer to use knowledge sharing and KMS systems more.

Information received from this study can be a guide or basis of information for other studies because the researcher has provided the information on knowledge management problems that have occurred in the government organisation in the issue concerning limitations that prevent knowledge sharing, increasing ability to work in with people in the organisation. However, this information may be used only with Thai organisations. Other variables and problems may exist in other different samples such as developed countries, developing countries etc.

Secondly, future studies should focus on use of technology that supports Electronic government services in Thailand. This study only discovered some information that might be an important variable that affects the development of E-Commerce in Thailand which relates directly to the efficiency of use. Although the E-government system in Thailand is still at the beginning level and still needs to be developed to be able to work well in the

upcoming future, the Thai government is supporting E-government by adopting new technology into the organisation and also work support strategy. The government hopes that the service and work be fast, safe, and reveal benefits to Thai people.

Other than that, this study suggests that it is interesting to study information concerning the operation of E-government services in any Ministry providing service to Thai citizens such as the Ministry of Justice, or Ministry of Commerce. An interesting example in a Thai organisation is that the Ministry of justice brought ICT and KM strategy to use in the organisation. The main purpose of using these two strategies is to encourage people in the organisation to use technology and turn the organisation into a learning organisation. The Ministry of Justice just has been using ICT and KM for only a few years, so this is another interesting group that might also face many problems.

Whether other Asian countries such as Vietnam, Laos and Cambodia would experience similar problems is another interesting research question.

6.9 Concluding Comments

Knowledge management strategies have been studied broadly in the modern world. There are many benefits that organisations can learn from its implementations such as improving a company's capabilities, potential and intellectual capital. However, most previous studies in the knowledge management area have focused on the influence of the technological perspective of knowledge management programs and awareness of organisational practices to knowledge management (KM) processes in developed countries (Chauvel & Despres 2002; Davenport & Prusak 1998; Thall 2005; Vorakulpipat & Rezgui 2006; Zyngier 2003). Moreover, the development of a knowledge conversion model and knowledge sharing process by using appropriate technologies in the public sector has not been well studied.

Thus, this research chose to study the relationship between knowledge conversion processes and technology acceptance in a Thai government organisation because the topic

of knowledge management has been promoted widely in the Thai public sector as a key strategic improvement for organisations.

A conceptual framework was developed based on the aim of the study. Ten participants in the Ministry of Commerce Thailand were individually interviewed to find out the external variables which have an impact on knowledge conversion process and the technology acceptance model. All research questions found answers and were discussed with supporting ideas.

The findings of this study indicate that there are many features that have an impact on the knowledge conversion process and knowledge sharing and technology acceptance in Thai public organisations. From the discovering process, Research Question One points out that some similar and different external variables in both IT and KM dimension have an impact on technology acceptance and knowledge conversion processes. Research Question Two indicates that modern technologies and social communication software have been used in processes of knowledge conversion in Thai public organisations such as MSN Messenger, and online discussion board (Webboard). Research Question Three suggests that sharing of knowledge in the Ministry of Commerce might increase after improvements in the knowledge conversion process. Finally, Research Question Four indicated that the technology acceptance model could help explain the knowledge conversion process in Thai public organisations but there are some external factors which might have an impact on this relation. However, this study does not cover this issue.

The contribution of knowledge conversion process and technology acceptance can enhance the common understanding in knowledge management implementation under Thai public management. Moreover, there was evidence in this study that suggested the organisation determine ways to enhance knowledge sharing and reduce barriers to knowledge conversion process by using information and communication technology and relevant external variables.

In conclusion, this research recommends that the multiple approaches (qualitative and quantitative approach) can be joined in further research. This might be of more benefit to

study a large sampling group in other public organisations. Moreover, the topic of knowledge management implementation and finding the existing problems in other Thai public organisations is still an interesting topic because further research might show the different effective ways to improve a Thai knowledge management structure.

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APPENDIX A: Consent Form

CONSENT FORM
FOR PARTICIPANTS
INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

I am Mr. Puripat Charnkit, a DBA Student, under the supervision of Dr. Arthur Tatnall at School of Information systems, Faculty of Business and Law. Victoria University.

We would like to invite you to be a part of a DBA study into "Using the Technology acceptance model to investigate Knowledge conversion in Thai public organisations" This study request that you complete an interview that will seek your view on a range of topics around Technology acceptance and knowledge conversion process in your organisation.

This research is examining the potential external variables that contribute to successful use of technologies in knowledge conversion process in Thai public organisations.

Your input will be extremely valuable to help us find out what could be recommended or improved in each Thai public organisation.

The interview will seek your views on a range of topics around Technology acceptance and knowledge conversion process in your organisation. If you decide to participate in this research study, you will be asked to take part in an interview with the researcher. I have attached the interview question guide to this letter for you additional information.

CERTIFICATION BY SUBJECT

I, _____of _____

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: "Using the Technology Acceptant Model to Investigate Knowledge Conversion in Thai Public Organisations" being conducted at Victoria University by Puripat Charnkit

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained by me (Puripat Charnkit)and that I freely consent to participation involving the below mentioned procedures:

- The interview will be conducted by Puripat Charnkit and the proceedings will be taped and note taken as a mean of recording data accurately.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:
Witness other than the researcher:.
Date:

Any queries about your participation in this project may be directed to the researcher (Principal supervisor: Associate Professor Dr. Arthur Tatnall ph. +61 3 9919 1034 or DBA candidate name: Puripat Charnkit ph. +61 4 0161 1917).
If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781

APPENDIX B: Information to participants involved in research

INFORMATION
TO PARTICIPANTS
INVOLVED IN RESEARCH

You are invited to participate

You are invited to participate in a research project entitled "Using the Technology Acceptance Model to investigate knowledge conversion in Thai public organisation". This project is being conducted by a student researcher Mr.Puripat Charnkit as part of a Doctor of Business Administration at Victoria University under the supervision of Dr. Arthur Tatnall from Faculty of Business and Law.

Project explanation

The aim of this research is to study the relationship between knowledge conversion processes and technology acceptance in Thai government organisations.

What will I be asked to do?

This study will use the interview method with a sample group to answer the research questions. The questions will relate to.

1. The general technology usage.
2. Problems and other variables which impact on expressive knowledge/information
3. Methods of creating knowledge and storing information

The interview will take approximately 30 minutes.

How will the information I give be used?

Data for this study will be collected by conducting semi-structured interviews. These will be recorded (with the interviewee's permission) and transcribed. To provide reliable data, this research will use tools such as a Tape recorder, electronic mail with respondents. The data will be displayed in the form of intermediate representation, for example graphical models, collections of themes and written descriptions.

What are the potential risks of participating in this project?

The results will be handled in strictest confidence and all data recorded will be stored in securely place. Any individual interview results will not be released and all data will be analysed only by the researcher

How will this project be conducted?

The raw data from related documents and interviews will remain private and confidential and in the hand of the researcher. Only the researcher will use the collective data results from the analysis.

Who is conducting the study?

This study is conducting by Mr.Puripat Charnkit under supervision of Principal supervisor Dr. Arthur Tatnall.

Any queries about your participation in this project may be directed to the researcher (Principal supervisor: Associate Professor Dr. Arthur Tatnall ph. +61 3 9919 1034 or DBA candidate name: Puripat Charnkit ph. +61 4 0161 1917)

If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781.

APPENDIX C: Response to the request letter

No. **0204/4088**

Information and Communication Technology Center
Office of the Permanent Secretary
Ministry of Commerce

44/100 Nontaburi 1 Road
,Muang District Nontaburi 11000
Thailand

22 September 2008

Subject: Response to the request letter

To: Mr. Puripat Charnkit

Refer: The Letter by Mr. Puripat Charnkit, Victoria University. 8 September 2008

Regarding to the letter by Mr. Puripat Charnkit, a DBA student at Victoria University, requesting for 10-15 staffs from the Knowledge Management Team and Information and Communication Technology Team to do the interview for your research in a title of "Using The Technology Acceptance Model to investigate knowledge conversion in Thai public organizations". After carefully consideration, Information and Communication Technology Center , Office of the Permanent Secretary Ministry of Commerce, is appreciate to participate in your interview and permitting you to do the interview with all the staffs you request and mention in your letter during October to November 2008.

Sincerely yours,

(Mrs. VeawTa Ruangnapha)

Director of Information and Communication Technology

No. **0401/7699**

Office of the Secretary
Department of Internal Trade
Ministry of Commerce

44/100 Nontaburi 1 Road
,Muang District
Nontaburi 11000 Thailand

9 September 2008

Subject: Response to the request letter

To: Mr. Puripat Charnkit

Refer: The Letter by Mr. Puripat Charnkit, Victoria University. 8 September 2008

Regarding to the letter by Mr. Puripat Charnkit, a DBA student at Victoria University, requesting for 10-15 staffs from the Knowledge Management Team and Information and Communication Technology Team to do the interview for your research in a title of "Using The Technology Acceptant Model to investigate knowledge conversion in Thai public organizations". After carefully consideration, Office of the Secretary of Department of Internal Trade, Ministry of Commerce, is appreciate to participate in your interview and permitting you to do the interview with all the staffs you request and mention in your letter during October to November 2008.

Sincerely yours,

(Mr. Vorapun Prasertying)
Secretary
Department of Internal Trade

APPENDIX D: Interview- Qualitative questions

Interview- Qualitative questions

Please note

This interview is aimed at the person who makes a decision in the development or design knowledge management programs and included technology applications in applying knowledge conversion process in public organisation. (Managers, Directors and Colleagues)

The Practical question that need to be answered in this survey

1.The general technology usage.

- What is your current technology that is used in organisation?
- Why technology is key success in your organisation, where you use in general?

- How often do you use them to support job application?
- Which technologies that you use to access the knowledge/ information in organisation? Why you choose them to support you?

- What type of technology that involve with knowledge management process in organisation do you use to enhance your job performance, how do you choose this to support you?

Remark

The general technology usage has been asked to investigate the type of technologies in organisation and also provide particular details about attitude of use of technology.

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2. Problems and other variables which impact on expressive knowledge/information

- What technologies or other strategies involved ICT that effected on your's knowledge creation
- Is policies , documents , technologies effected on expressive knowledge/information
- Which problems and other variable do you think the knowledge/ information cannot be provided in organisation effectively?
- Why you need knowledge management in organisation, where you use in general?

- What are the key factors that increase use of technology in knowledge creation processes in organisation, how they have impacted on technologies usage and social organisation?

Remark

Problems and other variables which impact on expressive knowledge/information have been asked to find out the real problems/ variables that organisation have seen at the moment and also compare with problems and variables which is stated in literature review.

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3. Methods of creating knowledge and storing information

- How do you share knowledge / information in work place
- Which activities do you use it frequently to create new knowledge or solve any problems between you and colleague/manager/organisation, how do you obtain them?
- How knowledge/information has been stored in your organisation, what technologies have been used to organise them, what are any problems or barriers to do this, how do you solve this problems by using technologies?
- What is organisation's strategy that involves with promoting knowledge by using technologies, how you design the strategies and when you use it?
- How you share knowledge/information with people/organisation, why you choose this method and how receiver collect knowledge/information after receive them?
- How people in organisation share knowledge/information to you, why you choose this method and how you collect knowledge/information after receive them?
- During transferring of knowledge between you and colleagues, what is the technology that you think more importance to create/share/store?
- What is result that organisation/you expects to processing of knowledge creation/sharing by adopting technologies into knowledge management strategies.

Remark

Methods of creating knowledge and storing information have been asked to study about knowledge conversion process in organisation and also in person. Moreover, these questions will indicate the frequency of use of knowledge conversion process and how people organise with knowledge/information in organisation.