

ANTECEDENT FACTORS OF KNOWLEDGE SHARING IN RESEARCH
SUPERVISION

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Dedicated to my beloved family

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ABSTRACT

One of the most important goals of universities is the promotion of students as future professional knowledge workers. Therefore, knowledge-sharing and transferring at tertiary level between students and supervisors is vital in universities; this asset would help to decrease the budget and provide an affordable way of doing research. To achieve the aim of this study, (which was, namely: assessment of the impact of individual, organizational and technical factors on knowledge-sharing in a research supervision domain), a specific research model was developed. This model was based on systematically analyzing and extracting all the knowledge-sharing impact factors and then choosing adaptable ones, according to research supervision models. To effectively evaluate the research model, a quantitative research method was adopted. Data was collected by survey questionnaires from 150 students from the Faculty of Computing at Universiti Teknologi Malaysia. The Smart PLS tool was used for data analysis. In sum, the results of this research show that individual factor in a research supervision domain, namely: the ability of students to share knowledge, in addition to technological factors, specifically, IT systems have the greatest impact on knowledge-sharing in the supervision process. Also, organizational factors (culture of the university, social networks, and supervisor support) have a positive impact on knowledge-sharing in research supervision. However, when compared with individual and technical factors, the effect of an organizational factor on knowledge-sharing in research supervision is not particularly strong in the case of this study. There is not a positive relationship currently existing between learning strategy and knowledge-sharing in research supervision. Finally, this study is among the first of its kind to empirically examine the antecedent factors of knowledge-sharing in the context of research supervision.

ABSTRAK

Salah satu matlamat terpenting bagi sesebuah universiti adalah mempromosikan pelajar sebagai pekerja profesional yang berpengetahuan di masa depan. Oleh itu, perkongsian dan pemindahan pengetahuan di peringkat pengajian tinggi di antara pelajar dan penyelia adalah penting di universiti; aset ini akan membantu dalam proses pengurangan bajet dan penyediaan kaedah yang bertepatan untuk melaksanakan penyelidikan. Untuk mencapai matlamat kajian ini, (iaitu: penilaian terhadap kesan faktor individu, organisasi dan teknikal ke atas perkongsian pengetahuan terhadap domain penyeliaan penyelidikan), model kajian spesifik telah dibangunkan. Model ini adalah berdasarkan proses analisa dan ekstrak secara sistematik semua faktor kesan perkongsian pengetahuan dari kajian literature dan faktor yang sesuai dipilih mengikut model penyeliaan penyelidikan. Untuk menilai model kajian dengan berkesan, kaedah penyelidikan kuantitatif telah diterima pakai. Data telah dikumpulkan menerusi kajian soal selidik daripada 150 pelajar di Fakulti Komputeran, Universiti Teknologi Malaysia. Perisian SmartPLS telah digunakan untuk menganalisis data. Kesimpulannya, hasil kajian ini menunjukkan bahawa faktor individu dalam domain penyeliaan penyelidikan, iaitu: keupayaan pelajar untuk berkongsi pengetahuan, di samping faktor-faktor teknologi, khususnya, sistem IT mempunyai kesan yang signifikan kepada perkongsian pengetahuan dalam proses penyeliaan. Selain itu, faktor-faktor organisasi (budaya universiti, rangkaian sosial, sokongan penyelia, dan strategi pembelajaran) mempunyai kesan positif kepada perkongsian pengetahuan dalam penyeliaan penyelidikan. Walau bagaimanapun, berbanding dengan faktor individu dan teknikal, kesan faktor organisasi dalam perkongsian pengetahuan dalam penyeliaan penyelidikan tidak begitu kuat dalam kes kajian ini. Akhir sekali, kajian ini adalah antara kajian pertama secara empirikal mengkaji faktor-faktor perkongsian pengetahuan dalam konteks penyeliaan penyelidikan.

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LIST OF SYMBOLS AND ABBREVIATIONS

<i>KM</i>	-	Knowledge Management
<i>KS</i>	-	Knowledge Sharing
<i>SMS</i>	-	The Supervisory Management Styles Model
<i>BPS</i>	-	The Blended Postgraduate Supervision Model
<i>PLS</i>	-	The Partial Least Squares
<i>SEM</i>	-	Structural Equation Modeling

CHAPTER 1

INTRODUCTION

1.1 Background of Study

We live in a competitive environment in which knowledge plays an integral role in gaining a competitive advantage. Therefore, we can say that we are faced with a knowledge-based economy in which possession of knowledge is a vital ability for the success of both individuals and organizations (Alavi and Leidner, 2001; Syed-Ikhsan and Rowland, 2004; van den Hooff and de Leeuw van Weenen, 2004). Therefore efficient knowledge management (i.e. creation, sharing, and application) has become the central debate in the new economy. When knowledge is created, it is then necessary to transfer and share it quickly in order to gain the advantage of this new asset and apply it in the organization. Knowledge is a necessary asset for an organization to achieve competitive power. The dilemma of knowledge-sharing can lead to failure of an organization in this competitive economy.

Organizations use knowledge-management techniques in order to improve innovation, efficiency and effectiveness in their companies (Lin *et al.*, 2012). There are some factors that have contributed to making knowledge-management so famous in recent days. One of these factors is the globalization of the economy. Myers *et al.* (1996) stated that this factor has forced firms to adapt to changes, as well as increasing innovation and process speed. Globalization not only influences the business world, but also impacts on other sectors like higher education. It is the resultant pressure on higher education institutes that has triggered the response to

global integration. Hence, universities in this competitive world should be more innovative and have their own competitive advantages.

Välilmaa and Hoffman (2008) stated that the increasing importance of knowledge, innovation and research are changing the social role of universities in the globalized world. Knowledge-management techniques were first used in profit-oriented companies. Thus, research on knowledge-management, including knowledge-sharing, was investigated in the following organizations:

- (i) British Petroleum
- (ii) Toyota
- (iii) Hewlett Packard, DaimlerChrysler
- (iv) Chevron, Ford, Xerox, Raytheon, IBM
- (v) Shell
- (vi) Siemens

Recently, knowledge-sharing has also extended to the domain of universities. Universities provide an appropriate environment in which to help academics propose their insights and ideas (Martin and Marion, 2005).

In universities, storing knowledge is not new, but the concept of sharing knowledge and using it among academics and students is new (Keramati and Azadeh, 2007). For academic institutions like business organizations, knowledge management can produce a competitive advantage. Studies conducted in universities in Asia showed that knowledge-sharing encounters similar barriers in the academic environment to those in the business environment. For example, in some universities, the culture of sharing is lacking and most activities are individualistic, with communication and collaboration between students in a group being weak (Basu and Sengupta, 2007). Research conducted by Yue Wah *et al.* (2007) in an educational institution in Singapore showed that the cost-benefit concerns of knowledge hoarding and rewards, open-mindedness of the sharer, as well as incentives impact strongly on knowledge-sharing, in comparison with organizational care or pro-social motives. In a research study which was carried out by Abdullah *et al.* (2009) at

several major universities in Malaysia the results showed that rewards and suitable incentives are important factors when using a knowledge management system in order to improve knowledge-sharing and motivate academics.

Knowledge-sharing obstacles are classified into three main groups, namely; individual, organizational and technological. Individual barriers are usually related to factors such as: differences in national culture, lack of communication skills, lack of time and trust, as well as differences in position status. Organizational barriers are associated with factors including: the accessibility of formal and informal meeting spaces, lack of infrastructure and resources and the physical environment. Technological barriers are related to factors such as unrealistic expectations of IS/IT systems, unwillingness to use applications, integrating and modifying technology-based systems and difficulties in building (Riege, 2005).

Through study activities in the research supervision process, knowledge is acquired and shared. This process enhances and fosters communication, research and learning at the top level (Zhao, 2003). In the view of students, this process assists them to reach professional and scientific aims and improves their skill in conducting research and enhancing their learning. Thus, it is a knowledge acquirement and knowledge application process. In the view of supervisors, their supervision can impact upon the progress of scientific knowledge through producing helpful research conditions and enhancing learning, as well as creating opportunities for students to conduct their own research projects. Hence, it is a knowledge-sharing application and acquisition event for supervisors. For students to graduate successfully, the supervisory process is vital. It is responsible, complex and subtle. In addition, a systematic knowledge-sharing approach is needed to assist both supervisors and students to obtain, share and apply knowledge. A knowledge-sharing approach means the supervisor focuses on assisting students to enhance their knowledge-sharing ability in research supervision (Raisinghani, 2000). This knowledge-sharing ability refers not only to the skill of using superior technological resources to manage information, but also to the ability to make a decision about select information and then using it (Zhao, 2003).

Using knowledge-sharing networks among students is one of the more popular knowledge-sharing approaches to enhance learning. This network uses information technology such as social media, weblog and teleconferencing.

The transfer of knowledge is a key to organizational success, quality and competitiveness. In universities, publications, presentations, websites, white papers, reports and policies are examples of methods used to transfer knowledge. The main challenge confronting institutions of higher education, however, is to shift the emphasis placed on key skills, business processes, and technologies in order to create systematic and well-integrated approaches to generate, codify and transfer knowledge throughout the institution. The main product of universities is post-graduate research which is produced by master and PhD students in the research supervision process. Therefore, in order to produce more knowledge efficiency and effectiveness, and at the same time decrease the time taken to complete a post-graduate thesis, optimization of the research supervision process is crucial.

The goal of this study is to fill the gap in the literature by concentrating on investigating the impact factors which are critical for successful knowledge-sharing in the research supervision process. The purpose of this study is to investigate impact factors that affect knowledge-sharing practices among students and supervisors at Universiti Teknologi Malaysia.

1.2 Research Motivation

Nowadays, universities face new challenges and opportunities, due to globalization and the development of new technology such as the internet and e-learning. Students' and lecturers' demands have changed and they expect to be able to use new technology for research supervision. Universities should be able to compete in the international environment, as well as absorbing international students and fulfilling new needs. They should compete comfortably in a knowledge-based economy and society. The main output of universities is research results and new knowledge that should be managed by using knowledge-management techniques.

Knowledge-sharing and transferring in universities between students and supervisors is vital for universities, as it can actually decrease the budget and provide an affordable way of doing research in universities. The important objective of universities is to improve students' skills and educate them to become expert knowledge workers. Some challenges that have changed the traditional methods of research education and supervision include:

- (i) A more varied population of research students having different interests and backgrounds.
- (ii) Requests raised for flexible research supervision and training which use new ICT technology to satisfy new needs.
- (iii) Due to the changing market, the job goals of research students are different.
- (iv) The changing nature of supervisory processes that allow students the freedom to choose research award types (either by coursework, project or research), mode of study, as well as the respective institute and supervisor.
- (v) Students should complete their postgraduate degree in the regulated time.
- (vi) Meetings between supervisors and students are a crucial part of the research supervision process. Frequently, meetings are set in quite a weak manner and the agenda is not clearly defined.

De Beer and Mason (2009) stated that the number of research students per supervisor has increased extensively over recent years. Some supervisors have more than 14 postgraduate students, both master and doctoral. Accordingly, there is a need for new ways to manage and supervise students. Using knowledge-sharing can lead to improvements in performance, efficiency and effectiveness in the supervision process. Zhao (2003) argues that using a knowledge-management approach in research supervision enhances the quality of the research supervision process that ultimately leads to an improvement in scholars' research skills. She mentioned some retention rates for the quality of educational programs such as student progress rate and completion rates, and observed that knowledge-sharing improves them. A

quantitative study was done by Rhodes *et al.* (2008). This study shows that knowledge-sharing in an organization can enhance innovation and organizational performance. Knowledge-sharing is considered to be an important factor in knowledge-management (KM). Literature studies include different factors which influence knowledge-sharing in organizations (Alavi *et al.*, 2006). In spite of the availability of superior systems and considerable amount of information in institutions, it is the organizational, behavioral and technological factors in sharing knowledge that are vital in concluding the success or failure of KM technologies (Dyer and McDonough, 2001). The factors that encourage or discourage knowledge-sharing in the supervision process are weakly understood (Zhao, 2003). Wang and Noe (2010) stated that current studies consider factors that influence knowledge-sharing from an organization level to the individual level. This study also examines the effects of the same on knowledge-sharing. As there is not any current quantitative research to consider the factors that influence knowledge-sharing in research supervision, it is essential that we watchfully examine the fundamental antecedents of knowledge-sharing. Understanding what major factors impact upon knowledge-sharing in the research supervision process is an important area of investigation that needs more focus.

1.3 Statement of the Problems

Universities face new challenges and opportunities, because of globalization and the development of new technology including the internet and e-learning. Students' and lecturers' demands have changed and they expect to be able to use the new technology for research supervision. Universities should compete in the international environment and absorb international students and fulfill new needs. They should compete in a knowledge based economy and society. A main objective of a knowledge-sharing approach in research supervision is to improve the quality of research education by enhancing students' research skills. Some students and supervisors do not have either the ability or motivation to share knowledge, therefore investigating individual factors in the research supervision domain is vital in order to improve knowledge-sharing in the research supervision process.

In research supervision, the relationship between supervisor and students is very important for the research process. In traditional supervision, communication between supervisors and students is face to face and, in this way, there is the assumption that the student is full-time and most probably on-campus. In recent years, with rapid growth and changes occurring in all parts of the world, (such as development of communication technology (ICT) and globalization), a variety of funding source shave appeared for research and some social issues. Supervisors and students are more mobile than before; there are more international students and part-time students than in the past, and these students need to be supervised in more flexible way. Thus, the demand for flexible research supervision and training is raised, so identifying technological factors in the research supervision domain is necessary.

The research supervision process is a knowledge exchange process that leads to the creation of knowledge through research activities. This is a knowledge acquirement and knowledge application process. And for supervisors, it represents a knowledge-sharing and application process. The supervisory process is vital to the success of students. Lack of performance, efficiency and effectiveness in the supervision process is one of the challenges that universities face. Accordingly, some strategies to improve these factors should be considered. For example, students should complete their postgraduate degrees in the regulated time-frame.

Meetings between supervisors and students are a crucial part of the research supervision process. Frequently, meetings are set in quite a weak manner and the agenda is not clearly defined. There are also instances of problems related to the collaboration and communication of supervisors and students. Sometimes students complain that the supervisors are not available to talk with about their research. This results in poor motivation and creates some problems for students. The process of research and supervision, together with all the collaboration needed between supervisors and students, can lead to planning and management under the one knowledge management strategy. This can help students to achieve research goals on time through the plan, while supervisors can monitor the research activity and control and lead the research. Effective knowledge-sharing is the best strategy that can

improve the supervisory process. It decreases the budget and offers an affordable way of doing research in universities.

Preparing research students to be proficient researchers is the focus of research supervision. One of the main purposes of a knowledge-sharing approach to research supervision is to improve the quality of the research process, which would ultimately lead to the enhancement of students' research experience. Literature studies include different factors which influence knowledge-sharing in organizations (Rhodes *et al.*, 2008). In spite of the availability of superior systems and the great amount of information in institutions, it is the organizational and behavioral factors in sharing knowledge that are vital in concluding the success or failure of knowledge-sharing technologies (Agarwal *et al.*, 2012; Boden *et al.*, 2012; Chen *et al.*, 2012; Chen and Cheng, 2012). Thus, knowledge-sharing success in the research process in universities depends on collaboration and knowledge-sharing among research group members, students and supervisors (Chen and Chen, 2009; Cheng *et al.*, 2009; Sohail and Daud, 2009; Wangpipatwong, 2009; Teh *et al.*, 2011; Wabwezi, 2011; Agarwal *et al.*, 2012).

It has been acknowledged that one of the greatest challenges in universities is the ability of managers to encourage students and supervisors to exchange their knowledge, experience and ideas among themselves (Zhao, 2001). Therefore, investigating organizational factors in the research supervision domain is important in order to enhance knowledge-sharing in this domain. Knowledge is now considered to be an asset in an organization, yet many researchers have opined that most employees within an organization are reluctant to share their knowledge (Nonaka and Takeuchi, 1995). The same situation seems to exist in the universities; hence, it would be worthwhile to investigate the factors that affect knowledge-sharing in the research supervision process.

Many studies have been conducted to verify the impact of different factors on knowledge-sharing in organizations (such as organizational, individual and technological factors). However, as far as the researcher is aware, only a few empirical studies have been conducted to determine the impact of the individual,

organizational and technological factors on knowledge-sharing altogether. Further, only a few studies were found that examined the effect of this factor in knowledge-sharing in universities. In a research supervision process case study, we could not find any study which examines individual, organizational and technological impact factors on knowledge-sharing.

Effective knowledge-sharing between supervisors and students can be a factor for innovation which leads to a competitive advantage for the university (Jackson *et al.*, 2006). A supervisor should devote a longer time in order for each student to transmit his knowledge to them; some of this knowledge is common for all students and all students need them. Identifying knowledge-sharing organizational factors and improving them can lead to a solution of this problem. Studies have shown that effective knowledge-sharing improves overall performance. This research focuses on different antecedent factors and their respective impact on knowledge-sharing between supervisors and students in the research supervision process. In previous knowledge-sharing research, some factors were found to be important in different areas. These consist of, namely: organizational and cultural factors, personal and psychological factors, team and interpersonal factors and technological factors.

Our aim in this research is improve the performance of supervisors by examining the main factors that affect knowledge-sharing between a supervisor and his students in research supervision. We also wish to examine the individual factor (ability to share), organizational factors (culture of university, social networks, learning strategy, and supervisor support) and technological factor (IT systems) on knowledge-sharing in the research supervision process.

The main question of this research is:

What are the antecedent factors of knowledge sharing in research supervision?

1.4 Research Questions

- What are the relevant antecedent factors of knowledge sharing in research supervision domain?
- What is a salient research model of knowledge sharing in research supervision domain?
- How the proposed research model can validate in real case study setting?

1.5 Objectives of the Study

- To derive relevant antecedent factors of knowledge sharing in research supervision domain.
- To develop a research model of knowledge sharing in research supervision domain.
- To validate the proposed research model in real case study setting.

1.6 Scope of the Study

This study focuses on investigating the effect of individual factor (ability to share), organizational factors (culture of university, social networks, learning strategy, and supervisor support) and technological factor (IT Systems) on knowledge-sharing in the research supervision process.

The research concentrated on the supervision process of postgraduate students at Universiti Teknologi Malaysia. The respondents for this research were postgraduate students of the Faculty of Computing at Universiti Teknologi Malaysia, to ensure that respondents have enough knowledge and experience about research supervision process, we chose postgraduate students who are in the last year of theirs' study.

1.7 Significance of the Study

This study aims to help managers of universities and supervisors to know which factors are effective for knowledge-sharing in a university in the research supervision process, in order to improve the performance and quality of the supervision process. Studies have shown that effective knowledge-sharing can improve overall performance, efficiency and effectiveness in the supervision process and can enhance innovation in universities. One of the main purposes of a knowledge-sharing approach to research supervision is to enhance the quality of the research process, by improving students' research experience. Knowledge-sharing actually decreases the budget and provides an affordable way of doing research in the universities, thus helping students to complete their postgraduate degrees in the regulated time. Hence, using knowledge-sharing can lead to improve performance, efficiency and effectiveness in the supervision process. The result of this research would prompt university managers to provide structures that would motivate students and supervisors to share their knowledge. This motivation can be in the form of rewards, recognitions, status or reputations.

This study aims to contribute to the body of knowledge by identifying the relationship between individual, organizational and technological factors, as well as knowledge-sharing in the research supervision process.

1.8 Research Methodology

A quantitative research method was adopted for this research. The quantitative method gives a clear indication of the requirements of the target users, as well as an understanding of the mechanisms of the postgraduate supervision process. In later stages, it will help to devise the most appropriate set of features for the research model and its evaluation. A survey will be conducted to set the groundwork for the project. The survey questions were designed to establish the current standing of the targeted users. The survey also attempted to determine the background of the users. The survey questionnaire was designed to investigate the impact of individual, organizational and technological knowledge-sharing factors on students. The data collected was analyzed by using Smart PLS (Partial Least Squares) and structural equation modeling was used for the analysis.

1.9 Research Strategy

The research strategy was organized in Figure 1.1

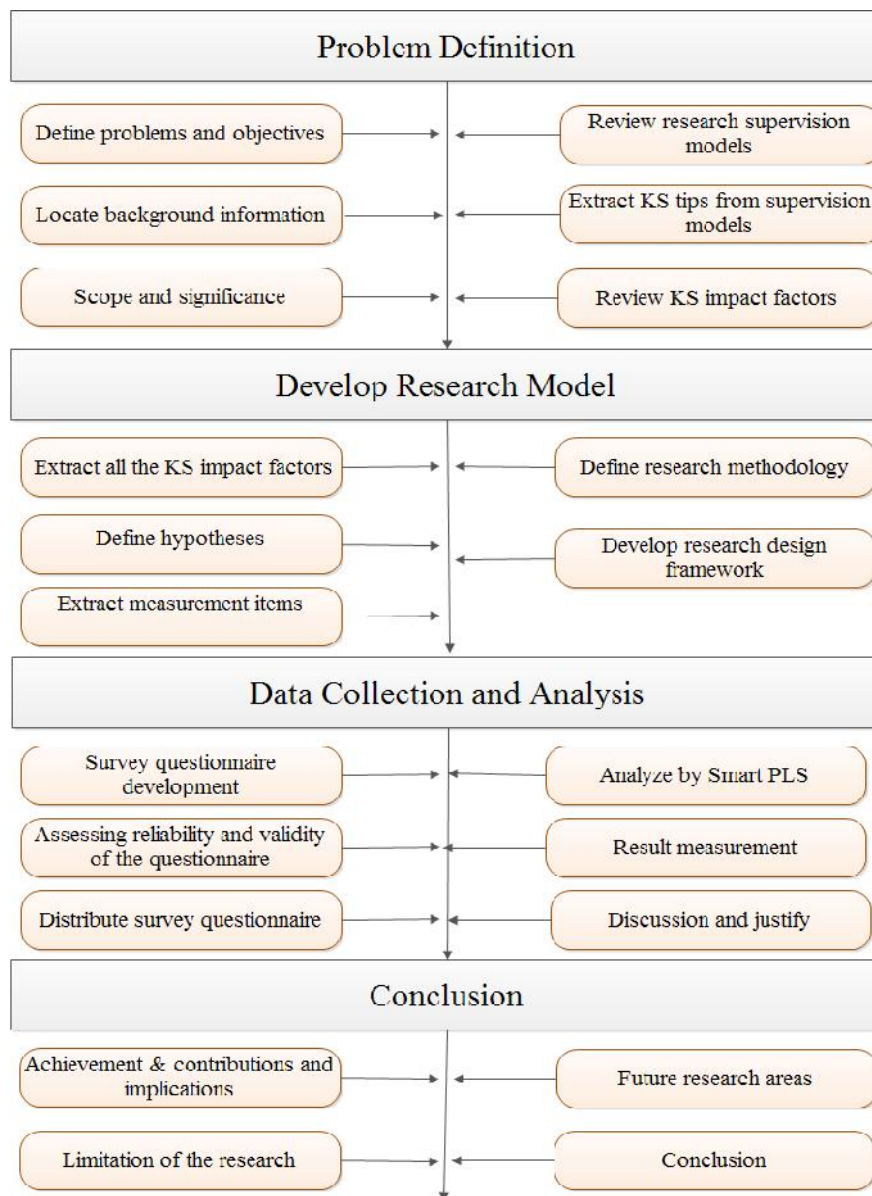


Figure 1-1 Research Strategy Development

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