

ICT PROJECT MANAGEMENT KNOWLEDGE COMMUNICATION MODEL
FOR MALAYSIAN PUBLIC SECTOR IN THE DIGITAL ERA

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DEDICATION

To Allah (SWT)

my beloved husband, Nor Aziran Yunus

my parents, Haji Daud and Hajah Maznah

my family, Nora, Fendi, Anis, Mus, Aboi and Nayly

and my friends

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ABSTRACT

Knowledge Communication (KC) refers to an approach of integrating knowledge to facilitate decision-making management in organisations. In the Malaysian public sector (MPS), it is fundamental for Information Technology (IT) experts and decision makers to have mutual understanding in making reliable decisions because they are responsible in planning and implementing ICT plans. However, multifunctional, frequently decentralized teams increase the complexity of the organization and project management as well. Hence, it increases the need for efficient communication, and a systematic and well-defined KC will facilitate the clarity of project management. More investigations are in need to arrive at a greater depth perspective of IT decision-making management particularly within the public sector context. Realising the importance of having KC in any project, this research identified the elements that can overcome the KC challenges in project management. This research developed and empirically verified a new model Knowledge Communication in ICT Project Management (KC-ICTPM) that can influence KC in ICT project management for MPS. Qualitative approach using case study and thematic analysis was used for the research. The conceptual model was developed based on the review of the existing KC literature and the Malaysia ICT Strategic Plan. Fifteen participants, who consisted of IT experts and decision makers, were selected and interviewed to review the proposed model. A deductive qualitative analysis and pattern matching approach were carried out to analyse the data from the interviews, and further enhanced the conceptual model. Then, the enhanced KC-ICTPM model was verified by another five experts and practitioners. In addition, a KC checklist was developed for ICT project management in MPS based on the enhanced KC-ICTPM model. The checklist was developed to make the model explicit and practical to IT experts and decision makers. Therefore, this research developed two significant contributions – KC-ICTPM model and MPSKC checklist – for effective decision-making management in organisations, particularly within the context of ICT project management in Malaysian public sector.

ABSTRAK

Komunikasi Pengetahuan (KC) merujuk kepada pendekatan mengintegrasikan pengetahuan untuk memudahkan pengurusan membuat keputusan dalam organisasi. Di sektor awam Malaysia (MPS), adalah penting bagi pakar Teknologi Maklumat (IT) dan pembuat keputusan untuk saling memahami dalam membuat keputusan yang boleh dipercayai kerana mereka bertanggungjawab dalam merancang dan melaksanakan hala tuju bidang teknologi maklumat dan komunikasi (ICT). Walau bagaimanapun, disebabkan kepelbagaian fungsi antara beberapa pihak menyebabkan peningkatan kerumitan terhadap organisasi dan pengurusan projek. Oleh itu, ini meningkatkan keperluan komunikasi yang cekap dan KC yang bersistematik serta jelas akan memudahkan kefahaman dalam pengurusan projek. Lebih banyak penyelidikan diperlukan untuk mencapai perspektif yang lebih mendalam terhadap pembuatan keputusan IT terutama dalam sektor awam. Menyedari kepentingan memiliki KC dalam mana-mana projek, penyelidikan ini mengenal pasti elemen-elemen yang dapat mengatasi cabaran KC dalam pengurusan projek. Penyelidikan ini membangunkan dan mengesahkan secara empirikal model baru Pengetahuan Komunikasi dalam Pengurusan Projek ICT (KC-ICTPM) yang mempengaruhi KC dalam pengurusan projek ICT untuk MPS. Pendekatan kualitatif menggunakan kajian kes dan analisis tematik digunakan sebagai strategi penyelidikan. Model konseptual dibangunkan berdasarkan tinjauan dari kajian KC yang ada dan Pelan Strategik ICT Malaysia. 15 peserta yang terdiri daripada pakar IT dan pembuat keputusan dipilih dan ditemu bual untuk mengkaji model yang dicadangkan. Analisis kualitatif deduktif dan pendekatan pepadanan pola dilakukan untuk menganalisis data dari temu bual dan menghasilkan model konsep. Kemudian, model KC-ICTPM yang ditambah baik telah disahkan oleh lima pakar dan pengamal terlatih lain. Di samping itu, senarai semak KC dikembangkan untuk pengurusan projek ICT di MPS berdasarkan model KC-ICTPM yang dipertingkatkan. Senarai semak dibuat untuk menjadikan model tersebut eksplisit dan praktikal kepada pakar IT dan pembuat keputusan. Secara keseluruhannya, kajian ini mengembangkan dua sumbangan penting - model KC-ICTPM dan senarai semak MPSKC - untuk pengurusan pembuatan keputusan yang berkesan dalam organisasi, terutamanya dalam konteks pengurusan projek ICT di sektor awam di Malaysia.

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LIST OF ABBREVIATIONS

KC	-	Knowledge Communication
JPICT	-	<i>Jawatankuasa Pemandu ICT</i>
JITIK	-	<i>Jawatankuasa IT dan Internet Kerajaan</i>
MPS	-	Malaysian Public Sector
MAMPU	-	Malaysian Administrative and Management Planning Unit
KMBOK	-	Knowledge Management Body of Knowledge
PMBOK	-	Project Management Body of Knowledge
UTM	-	Universiti Teknologi Malaysia
ICT	-	Information and Communication Technology
MPSKC	-	Malaysian Public Sector Knowledge Communication
KI	-	Knowledge Integration
KS	-	Knowledge Sharing
KT	-	Knowledge Transfer
PPrISA	-	ICT Project Management Guideline for Public Sector
KC-ICTPM	-	Knowledge Communication for ICT Project Management

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CHAPTER 1

INTRODUCTION

1.1 Overview

In the era of globalisation, many organisations around the world use knowledge as the main source of competitive advantage especially for service and business-oriented activities. Knowledge has become one of the main elements in making better and executable decisions for organisations. Knowledge is information linked together with experience, perception and background which is a valuable resource that would be ready to be applied in making decisions and planning for actions (Davenport, Long and Beers, 1998; Abubakar, Elrehail, Alatailat and Elci, 2019). Knowledge is also recognised as a resource to bring competitive benefit to organisations. Hence, the achievement and results of an organisation is narrowly connected to strategic abilities in decision making. The organisation also requires project management (PM) to ensure what is done, is right and provides real value towards the business opportunity. Good project management ensures that project priorities are closely associated with the company's strategic objectives. Aside from increasing profitability, enhancing project efficiency and providing the team with a clear vision, PM also requires a project plan. The project plan process in which the priorities, scope of the project and deadlines are clearly defined. This prevents the team from slowing down and eliminates bureaucracy. Through proper PM, efficient allocation of resources ensures that every resource is available when needed. However, the project complexity eventually will inhibit the target of the project's goal and objective. The complexity affects the project cost, time and quality. Hence, it is necessary for decision makers and experts to have good communication for managing the project complexity in order to produce a reliable decision.

Knowledge Communication (KC) is a key factor in ensuring successful project management. According to Gao, Koronios and Selle (2015), having multidisciplinary

teams is an important vital success factor for implementing a project. Therefore, a cross-functional team comprising of people such as subject-matter experts (SMEs), IT experts and business decision-makers will benefit to the full from the project. This is aligned with research by Foong (2014); Taherdoost, Kashavarzsaleh and Wang (2016), good communication among decision makers and experts can produce a reliable decision for an organisation. However, multifunctional, frequently decentralized teams increase the complexity of the organization and project management as well. Hence, it upsurge the need for efficient communication. This is where KC comes into the picture. A systematic and well-defined KC will facilitate the clarity of project management. Communication in project management is a critically important element which can have a major impact on a team's performance. The overall performance and productivity of the whole team increase dramatically, leading to other benefits as well (Saltz and Shamsurin, 2016). KC can help to reduce the misunderstanding, usage of jargon terms and the project team will be able to develop mutual understanding and grasp the big picture. However, KC is only possible when the communication has clear exchange of messages and responses among the team members. It is because communication is a process of obtaining entire information and interpreting then circulating it to those who want it while knowledge is the comprehension of information through experience or research (Mctear, 2008; Cetintas and Ozupek, 2012).

All this while, PM has been supported by knowledge transfer (KT) and knowledge sharing (KS). KS gathers altogether facts and information into one before it provides a comprehensive method in understanding the occurrence of knowledge. KT on the other hand is a dynamic, interactive and multi-directional process. Hence, according to Hidayat (2014) KC should consist of the process of KS and KT. It is because the process of knowledge sharing is a form of communication and knowledge transfer as an act of communication. The process of communication is aiming to contribute better understanding of “why is it difficult to manage even explicit knowledge” (Ahmad, 2016; Pangil and Nasurddin, 2013; Rooney, Hearn and Ninan, 2005). Hence, by identifying the gap, communication is made to the relevant parties for a project to be completed (Roseke, 2017) and by using compelling communication techniques, it can help to better circulate knowledge within an organisation, forbid

duplication and generate new knowledge through the exchange of existing knowledge (Reinhardt and Stattkus, 2002).

This research is focusing within the Malaysian Public Sector (MPS) domain. In MPS, the situation, population dynamics and trend in technology embedded the delivery service as a fundamental part of decision making. MPS is made up of twenty-seven (27) ministries and the aforementioned delivery process in MPS includes new projects. The projects vary from physical to non-physical projects such as Information Technology and Communication (ICT) and Human Resource (HR). Due to various types of projects in MPS, this research scopes on ICT project management in MPS. Subsequently, the team members involved are decision makers and IT experts.

1.2 Background of the Research

In a decision making process, knowledge management (KM) is widely applied to ensure decisions made are effective and any loss can be avoided. In the areas of business and management, KM has generated great interest among organisations because it can assist them to gain profits strategically, survive and compete healthily and make decisions effectively (Omotayo, 2015). KM is based on the concept of past and current “spiral process” activities of explicit and tacit knowledge that are understandable to end-users (Clark, 2011; Edosio, 2014). In addition, a perceptive insight in the Knowledge Ecosystem by McFarlane (2008, 2010) would help to control knowledge as useful resources in an organisation. In order to formulate an established Knowledge Ecosystem, the elements of the Knowledge System Knowledge (KSK), the Project Management Body of Knowledge (PMBOK), the Leadership and Managerial Knowledge (LMK) and the Organisational System, Structure and Process Knowledge (OSSPK) are referred to. These references complement the Knowledge Ecosystem in terms of organisations, societies, cultures, proficiency, device and knowledge of managers to ultimately accomplish an organisation’s mission and vision (McFarlane, 2008, 2010). However, according to Grigorescu, Lupu & Al Zink (2014); Mengis (2007a) communication perspective is one of relevant issues in knowledge management. Therefore, based on what has been mentioned, it can be said that

communication in project management is critically an important element which can have a major impact on the success of a project.

KC is a two-way communication that involves the process of transfer and sharing the knowledge between senders and receivers. It does not only convey information or facts, it also articulates ideas, makes hypotheses, synthesizes information, expresses opinions and concerns in the context of the situation involved. PM on the other hand includes planning, coordination, implementation, monitoring and execution decisions. The decisions are applicable to the knowledge areas present in any project, such as: integration, scope, time, expense, communication, people and risks. There are communicating processes, tools or techniques for each of these expertise areas which assist in the decision making process on how to manage the project (Yugue and Maximiano, 2012). In Information and Communication Technology (ICT) project management, KC involves the team of decision-makers and IT experts. KC typically starts in the initial phase of managing ICT projects. Generally, the ICT project in MPS has made several changes to address stakeholders' needs as well as to extend digital and online government services to the Malaysian public. Hence, both parties (decision makers and IT experts) participation are significant to ensure the success of projects.

Malaysia has invested abundant resources in ICT. In 1996, the Multimedia Super Corridor (MSC) blueprint and master plan was released and its main focus was to produce world-class quality multimedia products through the combination of Malaysians and international experts in ICT in line with the vision to be a developed country (Kaliannan, 2009). Ever since then, Malaysia has been spending billions on ICT projects. For example, RM3 billion was allocated for ICT infrastructure in the 2013 annual budget. In the 11th Malaysian Plan (RMK-11) it was stated that Malaysia was fetching to be one of most dedicated ICT countries in the world. However, with so much resources that have been invested, it is still disturbing that many ICT projects in this country have not met the standard to be considered as successful.

1.3 Problem Background

In achieving the status of a developed nation by the year 2020 and with the emergence of Industrial Revolution 4.0 (IR4.0), the government of Malaysia has been planning and implementing infrastructures to support these. To demonstrate the government's commitment, Malaysia has ISP (ICT Strategic Plan 2016-2020) to map the strategic direction of ICT development which is in line with the nation's vision and mission (MAMPU, 2016b). In doing so, the government allocated RM1 billion in 2017 to ICT in executing respective plans. However, it is unfortunate to witness that many of the ICT projects are unable to meet stakeholders' expectations. The failures of these ICT projects can be in the form of abandoned projects which resulted from surplus budget, or those that did not meet the standard or expectations of stakeholders or those that did not meet the public's needs (Ab Razak, 2016; Nawawi, Abd Rahman and Ibrahim, 2012). Heeks (2003) and Omar (2017) highlighted that most ICT projects in developing countries were subjected to failure and this was because of the failing government communication system.

Multiple research works by Meng, Abu Samah and Omar (2013); Nayan, Zaman and Tengku Sembuk (2010); Ramli (2012) showed that even though it was difficult to define exactly the failure of the seven flagships projects under Multimedia Super Corridor initiative, efforts need to be taken to improve the communication so that later projects were effectively and competently delivered. Patanakul (2014) stated that since many IT projects were considered as "failed", the challenge was to create mutual understanding on the communicated knowledge between IT experts and decision makers. According to Mengis (2007b), the communication problems that existed between IT experts and decision makers could be different language use, various areas of expertise, use of jargon terms and being too technical. Therefore, there is a need to explain how the communication takes place between the IT experts and decision makers so that the information communicated by them can be visualised in an understandable way (Mengis, 2007a; Ya'acob, 2015).

In studies conducted by Eppler (2007); Hidayat (2014); Kastberg (2015); Keloğlu-İşler & Bayram (2014); Lin & Ishida (2014); Liyanage, Elhag, Ballal and Li

(2009); Mengis (2007a) explanations and challenges of KC have been explained and these studies cover areas of crisis management, engineering, agriculture, education and health. Nevertheless, such researches contribute only to a detailed understanding of the conceptual/theory of KC and not to reflect on the perspective of project management specifically in ICT projects. The other KC models are generic models in the context of Knowledge Management. Realising the importance of having KC in any project, the study attempts to identify the elements that can overcome the KC challenges in project management. In the context of this research, it is crucial to investigate the miscommunication issues and challenges that take place between the relevant parties in managing the ICT projects in the public sector. Malaysia has witnessed an increasing number of ICT projects and therefore to ensure every single cent invested by the government is worthy, the obstacles or issues arise in the communication process while managing and implementing ICT projects need to be addressed. An observation conducted at one of the agencies in the public sector revealed that there seemed to be difficulty in communicating knowledge between decision makers and IT experts during the initial phase of ICT project management. This was due to the differences between the involved parties and as a result, it was difficult for them to comprehend one another. Therefore, when they discussed a particular issue or concern without sound understanding of each other's view of points, their decision might not be a good one and affected the success of the project.

In MPS, IT experts and decision makers belong to a body known as IT steering committee. They are accountable for decision making and forecasting organisations' future path (MAMPU, 2015). Therefore, the failing of ICT projects shall not be imposed and resolved solely by the technical side. Decision makers too, play a role by being more proactive in recognizing issues at various levels of planning, execution and monitoring of ICT projects. The Malaysian Administrative and Management Planning Unit (MAMPU) launched the PPrISA or ICT Project Management Guideline for Public Sector in 2018 (MAMPU, 2018). The PPrISA can be used as a guideline and is expected to assist the Project Manager in managing ICT projects in MPS and addressing the issues and problems occurring in ICT projects. The PPrISA comprises four phases which are: i) initial, ii) planning, iii) implementation and iv) closure. Figure 1.1 describes the ICT project management phases in MPS.

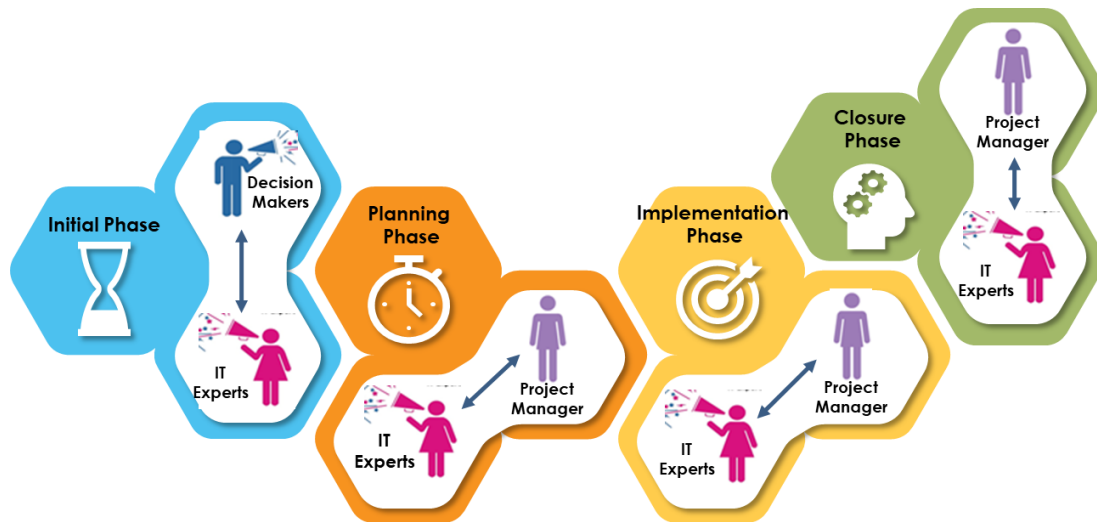


Figure 1.1 Phases in ICT Project Management in MPS

Based on Figure 1.1, first, the decision makers and IT experts assess the crucial elements of MPS’s ICT project management. The elements are cost, project completion time, recruitment of the human resources and project manager. An assessment is carried out to obtain financial approval and get the starting date. This is done during the meeting of the MPS IT Steering Committee. Second, in the planning phase, details of project planning in terms of governance and management strategies are laid out by project managers and IT experts. Third, in the implementation plan, project tasks are carried out and IT experts verified the deliverable tasks. This is where reports and schedules have to be prepared and meet the datelines set. Finally, the closure phase involves activities like project assessment, preparation of checklists and project closure reports, measurement of project success and the official closing activities of the project.

The main purpose of the IT steering committee is to gain relevant information on project planning and to obtain budget approval. There is also the technical review committee that reviews any technical matter and gets the approval from the ministries or agencies’ steering committee before proceeding to the next step. However, according to Veerankutty, Ramayah, and Ali (2018) in most cases, these committees were not set up by the agencies because project owners assumed that the project implementation team was sufficient to manage a project. In some cases, where the committees are set-up, their roles were uninformed. Due to the importance of approval

decisions obtained from the IT steering committee in the initial phase of ICT project management, hence it is crucial for both parties to form mutual knowledge understanding on the issues discussed.

Eppler (2012) and Hidayat (2014) stated that miscommunication may have resulted in misleading decisions. In the context of this research, in PPRISA, it is discovered that communication aspects are taken for granted in the initial phase of ICT project management in MPS. The initial phase in PPrISA consist of three main activities which are preparing project start-up papers, applying for financial allocation and authorizing the implementation of the project. However, in doing all these activities, miscommunication happens and often any issue due to the miscommunication is not addressed effectively. Therefore, a checklist in communicating knowledge during the initial phase is necessary to be developed. This is can be associated with a study by Omar (2017) and Hidayat (2014), in which it formulates and designs policies to improve awareness and understanding of projects in the public sector. An effective IT steering committee also supports in developing as well as sustaining the organisations' ICT projects management and infrastructure (Prasad, Heales and Green, 2010). This is in accordance with the PPrISA content that includes various types of IT steering committees in MPS.

There have been many studies conducted that described huge investment, time and efforts were made in planning, executing and monitoring ICT projects. However, the outcome of these projects were still not as expected (Chepa, Nur Azzah and Abu Bakar, 2018; Nayan et al, 2010; Patanakul, 2014). A circular from MAMPU in March 2010 stated "*one of the failure factors in ICT projects is Project Management weakness*". This shows that it is important to look into relevant components in PMBOK to improve ICT projects. In the Auditor General's Report (LKAN) from 2005-2010 to 2011-2015, it has disclosed that there are still technical and non-technical issues in project management that need to be addressed.

In addition, Ab Razak (2016) has indicated that the success of ICT projects includes technical and non-technical skills of IT experts such as business process, leadership and communication. In the review on successful critical factors (CSFs) of

ICT project management, Ab Razak (2016) identifies 16 CSFs and communication is one of them. The failure of ICT projects in MPS is mainly due to inability of decision makers to assess the project's scope (Nawi et al., 2011). Hence, it is important for decision makers and IT experts to fully equip themselves with non-technical skills to communicate knowledge effectively. The communication skill will help to overcome most of the failure symptoms in ICT project management as outlined by Foong (2014) in which he mentioned that one out of five projects failed due to miscommunication. Thus, based on what has been discussed, there is a need to develop a model related to KC so that any miscommunication that leads to bad decision making can be avoided and eventually saves millions of taxpayers' money.

1.4 Problem Statement

According to Grigorescu, Lupu & Al Zink (2014); Mengis (2007a) communication perspective is one of relevant issues in knowledge management. The process of communication is also specified to contribute better understanding on difficulty to manage the explicit knowledge. While there is an effort to look into communication issues, this is only a beginning, not many studies have look into ICT project management in public sector perspectives. Therefore, based on the problem background in section 1.3, this research intends to explore on the communication knowledge between IT experts and decision makers, particularly in ICT project management of Malaysian public sector (MPS). This is due to the fact that every crucial decision will determine the future direction of ICT in Malaysia. One of the issues in ICT project management, is the complexity of the project itself. In the ICT project management, the process of knowledge communication eventually starts from discussions among IT experts and decision makers at every level in an organisation. Consequently, the complexity of ICT project management where there are many stakeholders and their roles are interrelated and communication is the key aspect in ensuring the success of ICT projects. However, as mentioned earlier, the decision makers generally cannot make the right decision, because the assumptions made are based on the principles of the background and work experience of decision makers. In addition, there was also the inability to incorporate different points from experts and

to form a big picture of the issues discussed. Another issue that arise within organizations that practice knowledge management is when the workers can choose to preserve their own knowledge without communicating with the company and that would jeopardize the coordination of organizational operation and the consistency of the decision taken (Schauer, Vasconcelos, & Sen, 2015). In communicating knowledge, Eppler (2007); Mengis (2007a); Ya'acob (2015) have shown that one of the issues causing KC's difficulties between IT experts and decision-makers is the ICT terms which have their own jargon terms and are too technical to be understood by business society. This has resulted in difficulties for decision makers to understand, digest and incorporate all information to valuable knowledge for the decision making process. There is no current KC model in the context of ICT project management. Other research only leads to a comprehensive understanding of KC 's conceptual/theory and does not focus on the perspective of project management particularly in ICT projects. These KC models are generic models for Knowledge Management. Hence, research should be conducted to find ways of facilitating and improving knowledge communication so that potential conflicts and misunderstanding can be reduced. Throughout this way, the MPS will be able to use the KC model as a basis for a more comprehensive guidance to address communication challenges between IT experts and decision makers. This would help the MPS to make a reliable decision to minimize project costs, resources and time.

1.5 Research Questions

The research questions are designed to understand issues related to communicating knowledge in ICT project management of MPS. They are:

1. What are the KC challenges in ICT project management of the MPS?
2. What model can be developed to facilitate KC of ICT project management in MPS?
3. How viable is the KC-ICTPM model of ICT project management in MPS?

This research is examining the KC challenges between IT experts and decision makers in the MPS. A model will then be developed based on criteria and requirements discovered as well as evaluation made by relevant personnel on behalf of respective authorities in the MPS.

1.6 Research Objectives

The general objective of this research is to understand the challenges in KC of ICT project management in MPS. In doing this, four objectives are set. They are:

1. To describe the KC challenges and issues in ICT projects management of MPS.
2. To propose KC model for ICT project management makers in MPS.
3. To verify the KC-ICTPM model of ICT project management in MPS.
4. To review the KC checklist of ICT project management in MPS.

1.7 Significance of Research

The proposed KC-ICTPM model will be able to study the whole cycle of knowledge communication and recognise any problem or confusion that occurs in an organisation. It will also be able to cover the organisation's mission and vision according to stakeholders' expectations. The result of this research hopefully can be used for future research in other fields. The contributions of the proposed research are:

1.7.1 Theoretical outcome

The main contribution of this research work is the refinement of the KC process between IT experts and decision makers, which has been less prioritised by scholars

prior to this research. This research identifies issues and challenges in the KC process via the findings of previous research conducted KC scenarios. The findings are presented as elements and sub elements which would help the development of the proposed KC-ICTPM model. This new KC-ICTPM model contributes to the area of knowledge in the Knowledge Management (KM) and the Project Management Body of Knowledge (PMBOK), particularly in the area of communication. This research also extends the usage of Spiral Knowledge Model (Nonaka 1994) incorporating the use of both tacit and professional knowledge. This proposed KC-ICTPM model offers an integrated KC process with reliable outcomes, enhancing the quality of ICT project implementations, particularly in the initial phase.

1.7.2 Practical outcome

In terms of the practical contribution, this model can be used to current body of knowledge on KC and recognise the similarities and differences of KC practices in the MPS. This would guide the decision-making process by anticipating the possible influences that will lead to the success or failure of the initial phase of ICT projects, allowing them to tackle the issues beforehand. It would also assist in reducing miscommunication between the IT experts and decision makers, as well as help them focus on the common grounds. It could also provide insights on how to enhance the communication and decision-making practices within organisations, which would lead to better planning and more informed decision making in ICT development, adoption, execution and investment. The result obtained may assist knowledge integration among IT experts and decision makers in the MPS in building a good foundation in planning, executing and monitoring ICT projects effectively and efficiently.

1.7.3 Methodological outcome

For the methodological contribution, this research utilises the qualitative method approach. The qualitative approach allows the exploration and gathering of rich data in the studied scenario. The qualitative approach used for this research is a

combination of several consecutive research techniques: the interviews; the literature review; the multiple case studies; and the experts-guided interview. Hence, this research successfully exhibits how the qualitative method approach is able to deliver a comprehensive and in-depth finding compared to other similar studies in the KC area which applied mixed-method in the research (Hidayat 2014; Mengis 2007a).

1.8 Scope of Research

This research focuses on developing a model of knowledge communication between IT experts and decision makers in the MPS in making decisions on ICT projects. Therefore, the scope of this research are:

- (a) Unit of analysis of this research is organisation. Thus, the population for this research will be the government agencies, MAMPU and another two ministries in the Malaysian public sector which are involved in managing ICT projects.
- (b) The interviews respondents will be Malaysian public sector staff where the aggregated findings of interviews will reflect the organisation perspective. They are divided into two categories; the first category is IT experts or better known as F scheme officers and second category is decision makers who are the M scheme from selected ministries and agencies in Malaysia. The selected respondents must be from the Professional and Management Sector in the Malaysian public sector.
- (c) In making comparison and contrast for the purpose of the validation of the data, the data will be collected from the selected five agencies.
- (d) Based on the MPS ICT project lifecycle, the research will be in the initial phase. There are four phases: initial, planning, implementation and closure.

1.9 Definition of Terms

This section provides the explanation of the terms that are used within the context of this research.

- a) **Communication** is a process of acquiring all information then interprets and distributes it to who might need it (Cetintas and Ozupek, 2012)
- b) **Knowledge** is understanding of or combination information by experience, context, interpretation or study (Davenport, Long, and Beers, 1998)
- c) **Element** is a representation of an information unit that is composed with events, activities and examples (Strauss and Corbin, 1990). Within each element, there are several properties or sub-elements that are often labelled with term of participants' actual languages (Creswell 2014)
- d) **Project** is a temporary efforts made to produce an exclusive product, facility or outcome (Schwalbe, 2015)
- e) **Project Management** is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements (Schwalbe, 2015).
- f) **Framework** is a group of solutions that is used to plan and the reader can imagine the whole process described in the research (Mengis, 2007a).
- g) **Initial phase** is the first phase of the project lifecycle. This is where the project's value and feasibility are measured (MAMPU 2016a)
- h) **Model** is an abstraction of a system that aimed for understanding, communicating, explaining or designing aspects of interest (SEBoK contributors, 2018), which in this context is the KC-ICTPM model.
- i) **Process** is a sequence of actions or methods taken to achieve a specific goal leading to a final outcome (La Rosa et al., 2013). In this research, the term is used to explain the steps involved in communicating knowledge in the organisation.

- j) **Public Sector Organisation** is a form of organisation that arranges the management, conveyance and distribution of goods and services to its citizens. The Public Sector Organisations offer services including community safety, municipal development administration and nationwide defence coordination. The public sector is typically owned and managed by the government (Pathirane and Blades, 1982; Wettenhall, 2003). In this research, the term is Malaysian Public Sector.

1.10 Thesis Outline

This proposal is structured into several chapters as depicted in Figure 1.1 and these chapters are explained further in the following paragraphs:

Chapter 2 provides the review of literature on the current situation of knowledge communication globally in general and Malaysian public sector specifically. Since literature review plays an important role and will be enormously used in the overall research, chapter 2 then will only focus on the current state of knowledge communication between IT experts and decision makers of Malaysian public sector and the gaps to fill in. Having clear picture and good understanding of each situation and the interrelation between 5W (“What”, “Where”, “When”, “Why”, “Who”) and 1H (“How”) elements, the research is expected to gain actual in-depth apprehension the pertaining to knowledge communication decision making process between IT experts and decision makers in ICT project.

Chapter 3 delivers the explanation and the description on the research methodology that governs this research. Since the nature of this research is similar to the ‘problem solving’ method and its prime focus is to propose a model, it would therefore be appropriate to use Creswell (2014) research design as the foundation of research. The chapter further provides the explanation on qualitative approach consideration and the overview of the research design by Creswell. The stages of this proposal consist of five phases which investigate the issues and challenges, design knowledge communication conceptual model, knowledge communication research

model evaluation through case studies, analysis of the evaluation and finally the validation and report writing. Thus, the process, methods, data management and analysis and its expected outcomes will be discussed appropriately in this chapter.

Chapter 4 reports the proposed and refined knowledge communication model based on the pilot study conducted. The pilot study was conducted at one MPS agency. The selected participants are from IT experts and decision makers. Within this chapter, the understanding about the knowledge communication challenges and requirements through the literature review point of view will be presented. Based on the literature review conducted and pilot study done, the model is proposed, the KC challenges in MPS were reviewed and will be explained further in this chapter.

Chapter 5 presents the description of five (5) case studies chosen from the Malaysian public sector (MPS) based on selected criteria. This chapter provides the description of the agencies selected in terms of their background in the context of MPS; the hierarchy of the agencies and their functions; and how KC process is carried out during the initial phase of an ICT project. Data collected from the case studies will be transcribed and analysed accordingly in identifying KC patterns. All the elements are identified from multiple cross-case analysis. Better and in-depth understanding of significance elements and sub-elements in knowledge communication are then discussed. Qualitative data analysis technique is used to report and compile all the collected data.

Chapter 6 presents the comparative analysis of the findings from all the selected experts. The experts verify the elements and sub-elements discovered during case studies then the proposed KC-ICTPM model. The development of KC checklist in MPS and review process also further explained in this chapter. The iterative approach is applied to review the KC checklist.

Chapter 7 begins with the discussion of major research findings of KC in the MPS. This chapter is then organised in accordance with the findings of this research in line with the research objectives. This would include: the results from five (5) case studies that explore and verify KC in the MPS; the analysis of the findings from the

structured interview sessions with five (5) experts to validate the model of KC-ICTPM in MPS; as well as the identification of elements sub-elements that is crucial in the development of the Malaysian Public Sector Knowledge Communication (MPSKC) checklist. A summary of the results on the MPSKC checklist are reviewed by five (5) other experts iteratively. The theoretical and practical contributions of the KC study findings are then discussed, followed by a discussion on the study's limitations. Finally, this research outlines and suggests several recommendations for further research on KC.

This chapter provides the general overview of this research. Table 1.1 includes the research objectives, research questions, problem background, significance of the research and problem statement so that the study can be followed through smoothly and in an organised manner.

Table 1.1 Chapter Summary

Chapters	Research Phases	Activities	Deliverables	Research Objectives	Presentation & Publication
Chapter 1 Introduction	Phase 1: Investigation	Represent overview of the study		RO1	Presented at KMO and PARIS
Chapter 2 Literature Review	Phase 1: Investigation	Proposed Conceptual Model	Proposed Conceptual KC-ICTPM Model		
Chapter 3: Research Methodology	Phase 3: Data Collection	Case Study Protocol Development	Case Study Protocol		
Chapter 4: Pilot study	Phase 3: Data collection	Exploratory Case Study Execution	Findings from Pilot Study Thematic Analysis		Presented at ICRIIS and published at JATIT
		Refine Conceptual Model	Proposed Enhanced KC- ICTPM		

Chapters	Research Phases	Activities	Deliverables	Research Objectives	Presentation & Publication
			Conceptual Model		
Chapter 5: Malaysian public sector case study	Phase 3: Data collection	Exploratory Multiple Case Studies Execution	Input for Qualitative Data Analysis	RO2	Submitted and accepted to ICADAEIS
	Phase 4: Analysis	Multiple Case Studies Data Analysis	<ul style="list-style-type: none"> • Findings from case study • Proposed KC-ICTPM Model for MPS 		
Chapter 6: Experts' verification	Phase 5: Verification	Checklist Data and Interview Analysis	Findings from Checklist and Interview Analysis	RO3	Presented at PARIS
		Enhancing KC-ICTPM Model for MPS	Enhanced KC-ICTPM Model for MPS		
		Checklist	MPSKC Checklist	RO4	
Chapter 7: Discussion and conclusion		<ul style="list-style-type: none"> • Discussion of Major Findings Based on Research Objectives • Conclusion 	Final Report		University thesis

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