Developing Individuals for Developing Learning-Based Systems

A thesis submitted for the degree of Doctor of Philosophy

By

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ABSTRACT

This research is concerned with investigating the externalisation, sharing and making tangible of tacit knowledge in the context of organisational learning (OL). The externalisation, sharing and making tangible of tacit knowledge can provide "inputs" for Information Systems (IS) development. This process, in turn, can become a basis for the development of a system that is capable of promoting a learning environment within the organisation. However, the externalising, sharing and making tangible of tacit knowledge, a transparent and subjective form of knowledge, needs staff members' self-confidence and willingness to undertake it. Therefore, elements that can motivate staff members to externalise, share and make tangible their tacit knowledge or skills are needed. To undertake this, the elements of meta-abilities, understanding organisational roles, internal strengths, formal and informal discussions and rational discourse are proposed. For this research, all these propositions are integrated into a framework.

Therefore, the aim of this research is to study the elements that can encourage staff members to contribute inputs for learning-based systems development. The question to be used for the research is stated as follows: How do we include individuals in the learning-based systems development? Why use meta-abilities in order to include individuals in the learning-based systems development? By answering the question this research offers the following contributions. A novel topic in the IS area, meta-abilities is discussed within the context of the IS area. By considering these elements motivation and encouragement can be offered to staff members such that a contribution to inputs for learning-based systems development can occur.

The research approach undertaken in this research involved the use of a pilot and an in-depth case study, as well as interviews, observation and reference to archival documents. From the undertaken research it was concluded that the future focus for the OL-based IS development should be towards individual development strategies that develop interpretive, creative staff members. Interpretive, creative staff members in turn, are capable of externalising, sharing and documenting their own tacit knowledge based on the situational contexts and orientation. Systems analysts can study the documented inputs provided by the staff members and can codify them. This whole process will enable continuous re-examination and modification processes of organisational IS, thereby making its content become more relevant for OL.

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List of Abbreviations

BPR	Business Process Engineering
CMMS	Centralised Maintenance Management Systems
DR	Direct Reduction
DRI	Direct Reduced Iron
EAF	Electric Arc Furnace
E-mail	Electronic Mail
eQMS	Electronic Quality Management System
IS	Information Systems
IT	Information Technology
ICTs	Information Communication Technologies
LO	Learning Organisations
OL	Organisational Learning
PERWAJA	Perwaja Steel Pte Ltd
PETRONAS	Petroleum Nasional Berhad
TNB	Tenaga Nasional Berhad
TQM	Total Quality Management
UUM	Universiti Utara Malaysia

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1 CHAPTER ONE: Introduction

1.1 Introduction

Three major issues associated with learning-based systems are continuous system re-examination and modification (Meso and Smith, 2000), knowledge externalisation and sharing (Haldin-Herrgard, 2000), and making tacit knowledge tangible (Tsoukas, 2002). This is because in previous research, one of the factors that caused the failure of learning-based systems is that the previous frameworks of OL did not address the processing of tacit knowledge, which is deeply rooted in an individual's action, experience, ideals, values or emotions (Nonaka and Takeuchi, 1995; Malhotra, 1997; Malhotra, 2004). This research attempts to propose a conceptual framework to identify and discuss these issues and to ease the process of developing learning-based systems. To achieve this aim, this research assumes that there are two main aspects to be considered. These are the ability to externalise and share knowledge and skills, and self-documentation.

The reason for embedding knowledge-based inputs is that knowledge could be considered as a power, in the sense that it can be used to build alliances, extract additional information and change rationality (Pettigrew, 1972; Rollinson, 2005). Knowledge also provides the opportunity for power to be exercised, initially, in its most effective manner

which is by being hidden (Lukes, 1974). Additionally, once it is acquired, such knowledge is available for use in a discretionary manner, such as in defending a position or manipulating the outcomes of a meeting (Rollinson, 2005). In this case, the information from computerised information processing and flows will be interpreted, analysed, communicated and used in different approaches and ways by different management (Goold and Campbell, 1987; Rollinson, 2005).

It is widely accepted that the capability to externalise and share knowledge and skills is of paramount importance for gaining inputs from an individual (Haldin-Herrgard, 2000). It is better to understand an individual's ability in contributing to inputs then to update the contents of the system (ibid). This is because it is considered to begin aligning individuals in the IS development process without equipping them with such ability (ibid). Trivialising an individual's ability in contributing to inputs of the current company's norms will rapidly make an organisation's systems contents obsolete. This may cost more money and waste time, especially if the used system is expensive. Despite the importance of an individual's capability and willingness to contribute to inputs, most research has concentrated on designing system architecture for OL, with less emphasis on the abilities that establish an individual's involvement (e.g. Senge, 1990; Huber, 1991; DiBella, 1995; Courtney *et al.*, 1998; Meso and Smith, 2000). In other words, most of the existing OL-based IS frameworks implicitly assume that staff members are able to externalise and internalise knowledge and skills actively. They usually concentrate on aligning an organisation's system resources to what is thought to be able to create a learning environment or a continuous innovation (Meso and Smith, 2000). This approach discourages the continuous re-examination and modification of IS contents, which is critical in providing updated information for learning processes within the organisation. In this case, staff members will only be provided with obsolete information, which is incapable of offering new insights or working procedures (Malhotra, 1997).

The importance of documentation stems from the need to make explicit the hidden knowledge in an individual's mindset (tacit knowledge) (Haldin-Herrgard, 2000; Karhu, 2002). For example, a marketing manager's plan to increase sales can only be understood effectively by looking at his/her documented presentation. Thus, it is important to instil an awareness amongst staff members to document their ideas or experiences so that a basis for continuous improvement can be created.

In this research, meta-abilities are utilised as a basis of enabling staff members to gain strength in externalising, sharing knowledge and skills, and documenting those externalised and shared knowledge and skills. All these abilities, in turn, are developed by using the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. The use of meta-abilities in OL-based IS is a new idea in practice. Nevertheless, meta-abilities have been used extensively in organisational development literature (Butcher *et al.*, 1997). In the organisational development area, meta-abilities were found to be able to develop staff members' confidence and willingness to participate in the organisational development. As the issue of tacit knowledge externalisation, sharing and documentation is related to an individual's confidence and willingness to undertake it, the concept of meta-abilities needs to be emphasised in the IS areas as well.

The purpose of this chapter is to introduce both the topic of interest in this research and the contents and structure of the dissertation. First, the chapter will set the scene for the undertaken research. Then, a description and discussion of the research aim and objectives and the research methodology will be provided. This is followed by an overview of the chapter and the contents of the proceeding chapters are stated.

1.2 Learning-Based System and Meta-Abilities (Background)

As stated, meta-abilities have not yet been applied in learning management literature. There are three main reasons associated with applying meta-abilities to OL-based IS. They are: the need to continuously re-examine and modify IS, to develop strength to externalise and share tacit knowledge and to make tangible the tacit knowledge. This section briefly discusses these reasons. However, the following subsection provides a general discussion on OL and IS, by attempting to briefly define the role of meta-abilities in learning-based systems.

1.2.1 The Role of Meta-Abilities in Learning-Based Systems

In order for organisations to maintain a competitive edge, they must be capable of continuous learning (Senge, 1990). Learning organisations (LO) must have well-developed core competencies, show continuous improvement and have the ability to fundamentally renew or revitalise themselves. Many authors and researchers are coming forward to describe roles, skills and tools necessary for the development of LO (e.g. Huber, 1991;

DiBella, 1995; Nevis *et al.*, 1995; Slater and Narver, 1995; Courtney *et al.*, 1998; Malhotra, 1997). These frameworks all share the common feature that involves active human knowledge development. In this case, an individual needs to externalise knowledge to teach others, obtain clarification from others, and most importantly the individual must be willing to learn or change. However, the strength for such knowledge development is not always positive (Harvey and Butcher, 1998). Unwillingness to change amongst staff members can pose a problem to the organisation that intends to be competitive in a rapidly changing environment (Butcher *et al.*, 1997). Section 1.3 presents a brief discussion of the problems that such factors bring to an OL-based IS development. To overcome such problems, this research proposes the concept of meta-abilities that are needed to develop an individual's internal strengths in order to face such negative aspects in the learning environment. However, before this, the following three subsections explore the main problems faced during the development of learning-based systems.

1.2.2 Continuous Re-examination and Modification

One of the main reasons that meta-abilities are pertinent in the learning management area is the need to generate relevant and reliable information (Senge, 1990). Staff members are able to make the correct decisions at the right time by gaining access to relevant and reliable information (Malhotra, 2004). Before this can occur, the contents of a system must be continuously updated (ibid). Therefore, every organisation should have a platform to continuously re-examine and modify the contents of its organisational IS. To assist organisations in this area, this research will provide a humanistic perspective to an organisational IS. This is because pre-programmed solutions of IS contents usually work against the staff members' generation of multiple and contradictory viewpoints that are necessary for meeting the challenge posed by rapidly changing environments. This can even hamper individual and organisational learning and adaptive capabilities (Gill, 1995). To benefit from the dynamic knowledge creation in a human mindset, current knowledge that resides in an individual's mind can be used to continuously re-examine and modify an IS's contents. Continuously challenging the current organisational approaches, such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow (Malhotra, 1997). This value is critical in establishing a learning environment in the organisations.

1.2.3 Tacit Knowledge Externalisation and Sharing

The second problem faced during the development of learning-based systems is the difficulty associated with tacit knowledge externalisation and sharing. Tacit knowledge is transparent and subjective in nature (Augier and Vendelo, 1999); therefore, it is often difficult to express or document knowledge that appears obvious and natural to one's self (Haldin-Herrgard, 2000). It is further argued that the difficulty in externalising or sharing tacit knowledge is also linked to language, time, value and distance (ibid). In contrast, Harvey and Butcher (1998) emphasise factors that prevent individuals from externalising or sharing their tacit knowledge, such as a lack of confidence, anxiety, unwillingness, confusion and being carried away by strong feelings. Therefore, to continuously re-examine and modify an IS such that it can be dedicated to learning, individuals must have an ability to externalise and share their tacit knowledge. Additionally, individuals need to have internal strengths, such as self belief, commitment, enthusiasm and perseverance (Butcher *et al.*, 1997). Individuals who are not equipped with these internal strengths will become passive in terms of their motivation and their contribution towards organisational prosperity (ibid). In short, individuals must initially be equipped with the willingness and competency to use their knowledge effectively before the success of developing OL-based IS can be achieved. To achieve this, this research proposes the concept of meta-abilities.

1.2.4 Making Tacit Knowledge Tangible

Another problem with a learning-based system is related to the offering of tangible tacit knowledge. This is because tacit knowledge is intangible and cannot be measured easily (Augier and Vendelo, 1999). In contrast, there are many elements that prevent staff members from documenting their ideas or activities, such as unwillingness, a lack of confidence and confusion. This issue usually causes a system officer to face a major problem of how to obtain inputs from the staff members to enable a continuous IS re-examination and modification, which is required for developing a learning-based system.

Whilst this section discusses the problems that surround learning-based IS development, the next subsection will offer brief descriptions of the limitations associated with the current learning-based system developmental frameworks.

1.3 Current Learning-Based System Developmental Frameworks

This section discusses the limitations associated with the current frameworks applied in developing learning-based systems. These limitations are related to the inability of the frameworks in fulfilling the humanistic requirements of learning-based systems described in the previous section, and their lack of flexibility in accumulating the staff members' tacit knowledge. The subsequent subsection discusses some of the favoured framework features, assumed by this research, for fulfilling the above humanistic requirements.

1.3.1 Limitations of Current Learning-Based System Developmental Frameworks

Two of the limitations of current learning-based developmental frameworks are as follows: (1) the assumption that staff members will actively participate in the learning process and (2) the methods for accumulating tacit knowledge (Malhotra, 1997). One of the main problems associated with the developmental frameworks of a learning-based system is that it is assumed that staff members will actively participate in the learning process. For example, staff members are assumed to willingly give ideas or create actions that can benefit the organisations when facing volatile environments. However, this assumption is not always the case in practical situations (Harvey and Butcher, 1998). There are many elements that impede these learning activities, such as a lack of confidence, anxiety, unwillingness, confusion and being carried away by strong feelings (ibid).

Since tacit knowledge is not easily measured and quantifiable, the methods for externalising it are limited. Examples of methods are interview sessions (Brooking, 1998; Sveiby, 2001; Karhu, 2002), narrations or story telling (Stewart, 1997; Wah, 1999; Linde, 2001), knowledge exchange protocols (Heschel *et al.*, 2001), the repertory grid (Jankowicz, 2001), analogies or metaphors (Nonaka and Takeuchi, 1995, Stewart, 1997) and the creation of concepts or hypotheses (e.g. 'what if…') (Nonaka and Takeuchi, 1995). Basically, all these methods can only elicit the knowledge that is used to manage one's self, others or one's tasks (Smith, 2001). Also, staff members have to think and articulate systematically the best actions to tackle one problematic situation at a time (ibid). However, a difficulty arises due to staff members having to acquire the learning of new organisational approaches only when undertaking their tasks. These new organisational approaches are normally experienced in a creative and spontaneous manner due to a desire

in creating the most innovative and economical approach (Gill, 1995). It is argued that systematic tacit knowledge articulation and sharing is not capable of appreciating such creative and innovative practices because it occurs in an unplanned and sudden manner (Smith, 2001). There are more details on why these methods hinder the process of knowledge acquisition for learning-based IS development in Chapter 2.

1.3.2 Possible Solutions

This subsection discusses why meta-abilities can be used to overcome the aforementioned limitations. The concept of meta-abilities was initially applied in the psychology area and was defined as an emotional intelligence that acts as a master aptitude, support or interference with the use of other kinds of intelligence and skills (Goleman, 1995). As the benefits of meta-abilities became evident in other disciplines, such as organisational development, it became more widely applied. In the organisational development discipline, organisations were developed on the basis of peoples, and meta-abilities assisted in motivating them to contribute to the development of organisation through: (1) improving personal managerial practice; (2) extending their personal sphere of influence; (3) providing a critical perspective and (4) changing the organisation (Butcher *et al.*, 1997). As discussed earlier, the IS area also suffers in incorporating the staff members in the system development; therefore, this concept needs to be emphasised in the IS areas as well.

Butcher *et al.* (1997) introduced the concept of meta-abilities in their organisational development research and found that it is grounded in the view that an individual's effective performance is inextricably linked to his/her psychological development or maturity. They defined meta-abilities as the underlying learned abilities that play an important role in enabling, and making effective, a wider range of managerial knowledge and skills. In other words, meta-abilities are those personal, acquired abilities that underpin and determine how and when knowledge will be practised within the organisation. Four main meta-abilities were identified in the organisational development area as follows: (1) cognitive skills; (2) self-knowledge; (3) emotional resilience and (4) personal drive.

The benefits of meta-abilities were also recognised as: (1) an initial development resulted in improved personal influencing skills, such as communication, assertiveness, dealing with conflict, persuasion and developing others; (2) they contribute in important

ways to individuals being more astute and insightful; (3) they contribute in important ways to individuals being able to make better judgements and (4) they enable individuals to see more alternative actions. As such, the individuals are better equipped to navigate the difficult and dynamic organisational reality and operate effectively within it (Butcher *et al.*, 1997). Therefore, meta-abilities allow individuals to be able to extend their personal sphere of influence and provide a more critical perspective, such as providing ideas on improving daily activities and marketing strategies. In addition, meta-abilities enable individuals to provide greater insight and are more direct when focusing attention and asking significant questions. For instance, when discussing the strategy on improving sales, individuals will initially question the factors that slump the sales before giving ideas on improving sales. All of these factors enable individuals to influence key people. For instance, senior and middle management can serve as role models and become more challenging in the workplace. In other words, individuals act as a spur to organisational development – questioning implicit assumptions, exploring new possibilities and directing energies toward higher standards (ibid).

Butcher *et al.* (1997) also found that as a result of their meta-abilities development, individuals can implement significant changes within their organisations. These changes range from introducing specific initiatives to realigning the culture and values of the organisation. Significantly, these changes are individually driven, at times fragmented actions, which succeed in creating subcultures, demonstrating new approaches and influencing attitudes within the organisation. They are underpinned, not by corporate control or widespread campaigns, but by an understanding of the complexity and political nature of the organisational influencing process. Above all, they are driven by individual belief, commitment, enthusiasm and perseverance in the individual. All these represent an individual's confidence, a sense of responsibility and belonging to the organisation, particularly when dealing with any problematic situations within the organisation. In turn, these internal values enable individuals to gain strength and willingness to externalise and share their tacit knowledge, as well as to document their ideas and views in order to improve daily operations. These scenarios, as mentioned above, are critical in the process of developing learning-based IS.

Therefore, it can be suggested that meta-abilities assist in building a confident individual who can face the difficulties in the externalisation and sharing of tacit

knowledge, obtaining opinions from colleagues and documenting the externalised and shared tacit knowledge. Documenting this externalised and shared tacit knowledge can develop synergistic inputs for the continuous development of IS. Due to the updated content, an IS can promote learning activity in the organisation. This learning activity enables staff members in improving their daily operations and consequently reduces the risk of delivering unsatisfactory product or services to the clients. This theoretical understanding of the role of meta-abilities in the development of learning–based systems is studied by developing a framework. In turn, the applicability of the framework will be validated and investigated in a real life setting in this research.

1.4 Research Aim, Question and Objectives

This research considers a means of enabling an organisation to establish an effective learning process by incorporating the staff members into the system's development. As a result, this research will attempt to develop a conceptual framework that will promote the tacit knowledge externalisation and sharing process, within and between staff members, and knowledge documentation. To understand this research in a better manner, the research aim, question and objectives are posited. These are dealt with in the following subsections.

1.4.1 Aim of this Research

The aim of this research is: "To study the elements that can encourage staff members to contribute inputs for learning-based systems development."

1.4.2 Research Questions

The research questions are mainly related to whether the propositions of this research can be obtained in a real life setting. The research questions to be used for the research are stated as follows:

How do we include individuals in the learning-based systems development?

Why use meta-abilities in order to include individuals in the learning-based systems development?

1.4.3 Objectives of the Research

To achieve the above research aim and to answer the above research question it is suggested that some objectives have to be set as stepping stones. These objectives are summarised as follows:

- **Review of the Literature**

  The first objective in this research is to determine the current status of practice and how the existing humanistic elements may help in achieving the aim of this research. For this reason, the literature on the existing humanistic elements is going to be reviewed and analysed critically. Therefore, if no suitable humanistic element is found, it is possible to elicit the most relevant humanistic element and learn from its applicability. The existing humanistic elements will be appraised with regards to their capability as an aid to understanding the problem.

- **Development of Research Propositions**

  The literature review paves the way for establishing the research propositions. In this particular research, the main proposition will be: meta-abilities enable staff members to externalise and share their tacit knowledge, and motivate them to document the externalised and shared tacit knowledge for updating a learning-based system.

- **Establishing the Conceptual Framework**

  The research propositions represent the gap between the existing framework and the research aim. The third objective is about identifying a means to close this gap. This will be accomplished by identifying the principles of a conceptual framework that achieve the aim of this research. At this level, the basic constructs of the framework will be identified.

- **Testing the Conceptual Framework**

  After establishing the initial theory of a conceptual framework, it is important to test it and identify the main weaknesses that may hinder the framework from achieving the aim of this research (enabling tacit knowledge externalisation, sharing and documentation).

- **Identifying Areas for Improvement**

  After identifying the strengths and weaknesses, the next objective is to realise areas for improving the conceptual framework. Areas for improvement are based on strengthening the significant features of the framework and eliminating or minimising the weaknesses associated with it.

- **Extrapolating Conclusions**

  After the conceptual framework is refined, then it requires a repeated appraisal in order to determine its operability and suitability in achieving the main aim of this research. The objective at this stage is to extrapolate the final conclusions about the conceptual framework and how it would be reusable in other IS areas – which represents the main application area of this research – and how it would be helpful in the process of tacit knowledge externalisation, sharing and documentation.

It is hoped that the aim of this research will be reached by fulfilling these objectives. The aim of this research is not just to develop a conceptual framework that motivates staff members in the participation of the development of a learning-based system. It is also about drawing attention to such scenarios and the reasons why it is important to research them.

1.5 Research Methodology

To fulfil the research aim, a research methodology is required. Irani *et al.* (1999) emphasise the importance of having a relevant research methodology based on the research problem in hand, either related to the natural sciences or social sciences, both with their corresponding features. A well developed methodology provides an understanding, in the broadest possible terms, not of the products of the scientific enquiry but of the process itself. A research methodology also serves as a set of rules for reasoning, whereby the evaluation of the facts can be used to draw inferences. However, a research methodology must not, regardless of all other conditions, dominate the research procedure. The research methodologies must be regarded as mere intellectual frameworks and should not be overused (Quinn, 1988).

The aim of this thesis is to identify and develop a conceptual framework related to the enablers of tacit knowledge externalisation and sharing in the context of an OL-based IS. The data required for fulfilling this aim has been acquired using the qualitative research method. A suitable research strategy for this research is case study based. The case study method is chosen because it allows this research to obtain a deep and rich understanding on the subject of the study (Gable, 1994). Due to the nature of the research, which is transparent and subjective in characteristics, three research stages are undertaken during

the case studies: (1) understanding the operational background of case studies; (2) the implementation of the training programme and (3) data collection for the research analysis.

Case studies can involve single or multiple cases (Yin, 1994; Rowley, 2002). In this dissertation, an in-depth case study and a pilot case were undertaken. The aim of the pilot was to study the suitability of this research conceptual framework in a practical situation. In both situations, an in-depth case study and a pilot case, the supposition made was that there was no hypothesis to form and test.

The research also undertook data collection after the training programme. The data collection techniques used for the research were open-ended interviews, reference to archival documents and observations. Open-ended interviews were chosen as "an investigator can ask respondents questions and the respondents' opinions about events" (Yin, 1984). Interviews were chosen as they allow researchers to interact with members of the organisation, and indirectly, depending upon the location of the interview, to observe situations.

The qualitative data was analysed using hermeneutics. Hermeneutics were utilised because they enabled the understanding of the impact of meta-abilities on tacit knowledge externalisation and sharing from the text (text-analogue). To undertake hermeneutic analysis, this research utilised a decision-making trail. This approach supports the principles of academic rigour in qualitative research, as a decision permits the research community to make their own judgements concerning the process of analysis, the overall trustworthiness of the research, and therefore its presented interpretations (Clarke, 1999).

1.6 Dissertation Outline

In order to familiarise the reader with this dissertation, the following outline is offered. This dissertation is composed of eight chapters. Each of the chapters provides an understanding to various issues viewed to be critical for this research. The descriptions of each chapter are provided in Table 1.1.

Table 1.1 Dissertation Outline

Chapter	Description
Chapter 1	Provides an introduction to the main issues that this research will address. It also describes the aims and objectives of this research. To achieve the aims and objectives, a certain research methodology is required and an introduction to that aspect is provided in this chapter.
Chapter 2	Provides a description and discussion of the theory surrounding the issues to be investigated within the research of this dissertation. By discussing the normative issues, a context for the research is provided. These arguments provide a basis for the research topics to be investigated and determined in chapters 4, 5 and 6.
Chapter 3	Discusses the reasoning behind the research methods. The inherent problems within the various research methods are stated and the suitability to this research is provided. The research strategies existing within the IS field are also described and discussed within this chapter.
Chapter 4	Provides a background of the pilot study and attempts to describe the main issues identified within chapters 1 and 2.
Chapter 5	Describes and discusses the findings of the real life case study. The issues identified within chapters 1, 2 and 4 are dealt with.
Chapter 6	Analyses the obtained results utilising the earlier stated normative literature of Chapter 2. The variations that have occurred in the empirical evidence and advantages of the observed evidence will be stated. Discusses the contribution of this research, where elements or certain techniques of hermeneutic modes of analysis are used to validate a conceptual framework that can assist future research. A conceptual framework that can assist with future research is developed, drawing upon some of the findings of the research and the understanding of the processes and actions of the organisations. A framework that can be employed in the future is then offered in this chapter.
Chapter 7	Summarises the research presented in this dissertation. Additionally, it provides the major conclusions reached about the possible limitations of the research and describes and discusses the potential areas for further research.

1.7 Summary

This chapter has provided an introduction to the significant issues that this research covers. By doing so, the readers are presented with an overview of this dissertation. An introduction to the nature of OL, the externalisation and sharing of tacit knowledge and meta-abilities has been provided. Then the research objectives and methodology have been presented.

The chapter also provides readers with details of the objectives and expected outcomes of the research, whilst simultaneously providing examples of the detailed discussions to be offered in the subsequent chapters. This chapter is meant to provide a brief description of the route that the dissertation adopts.

2 CHAPTER TWO: Literature Review

2.1 Introduction

As noted in Chapter 1, this dissertation's research questions are as follows: "How do we include individuals in the learning-based systems development? Why use meta-abilities in order to include individuals in the learning-based systems development?" In other words, this dissertation explores the relationship between an individual's meta-abilities and the externalisation and sharing of tacit knowledge that can be used to sustain systems in LO. This chapter will provide the theoretical reasoning for this question.

2.2 Data, Information, Knowledge and Learning

Data are mere measures or representations of facts around us (numbers, words, sounds and images) (Manogran and Liang, 1998; Bhatt, 2001; Laudon and Laudon, 2003). When data are keyed into the computerised IS, they can be processed and transformed into information (ibid). In other words, information is the relationships and patterns that occur across data or over time (ibid). For example, the age of individuals dying over a period of time is data. However, after processing the data, it is found that the life span of the United Kingdom's population has increased from 70 years in 1970 to 80 years in 1990. When the system's users internalise the information into their mindsets, build connections across

information and organise information in ways that they can navigate through to make choices or decisions, then it becomes knowledge (ibid). When individuals are able to apply the knowledge and continuously adapt it, based on the feedback received, then learning takes place (ibid). Therefore, it can be learnt that the relationship between data, information, knowledge and learning is recursive in the computerised IS area.

Currently, the knowledge that most staff members would have acquired over the years in the organisation remains embedded in their minds (tacit knowledge) (Churchman, 1971; Tsoukas and Vladimirou, 2000; Beveren, 2002; Tsoukas, 2002). Such knowledge is lost when staff members leave the organisation. As a result, the involved organisations have to "reinvent the wheel." Additionally, it is also possible that some executives may be operating their organisations based on inadequate or obsolete knowledge when knowledge is not shared across the organisation. These scenarios illustrate ineffective learning processes in the involved organisations. Therefore, there is a need to embed staff members' skills and ideas into the computerised systems so that learning activities can be established effectively. This process is termed as knowledge management (Burnes, 2004). Knowledge management is defined as a process or practice of creating, acquiring, capturing, sharing and using knowledge wherever it resides, to enhance learning and performance in organisations (ibid).

From the above discussion, it can be learnt that OL is an ongoing process that takes place as employees engage in the iterative process of knowledge externalisation and internalisation (Nonaka and Takeuchi, 1995; Quinn *et al.*, 1996; Davenport *et al.*, 1998). Externalisation occurs when an employee's tacit knowledge is captured as explicit knowledge. Explicit knowledge is knowledge that is expressed, communicated, codified and documented by an individual (ibid). Contrastingly, internalisation transpires when the captured explicit knowledge is transformed into another employee's tacit knowledge. Therefore, OL occurs at the intersection of tacit and explicit knowledge during the interaction of the various employees in an organisation (Nonaka and Takeuchi, 1995; Malhotra, 1997). However, staff members must be willing to externalise, share or document their tacit knowledge or ideas so that systems officers can obtain inputs for updating organisational IS. In other words, this factor is the essence in developing learning-enabled IS (Meso and Smith, 2000).

This research intends to find basic elements that may assist an organisation to motivate its staff members in externalising, sharing and documenting their knowledge for developing learning-enabled IS. This is because there are many elements that prevent staff members from externalising, sharing and documenting their tacit knowledge, such as anxiety, lack of confidence, unwillingness, confusion and being carried away by strong feelings (Harvey and Butcher, 1998). To achieve this, the next section will describe and define the relationship between learning-based systems and tacit knowledge.

2.3 Learning-Based Systems and Tacit Knowledge

As mentioned in Chapter 1 there are three main issues that are faced by an organisation in an attempt to establish learning environments, which also affect the preparation of an IS. These are: *continuous system re-examination and modification, tacit knowledge externalisation and sharing* and *making tangible the tacit knowledge*. Together, these factors make it difficult to develop an effective learning-based system in order to establish learning environments. Learning environments assist staff members in improving their daily operations and consequently reduces the risk of delivering unsatisfactory products or services to clients. It was also mentioned that several frameworks are used to solve such problems. However, most frameworks, as discussed in section 2.4, are based on the supposition that staff members are willing to externalise and share their tacit knowledge in order to provide continuous inputs for a re-examination and modification of an IS. Practically, this is not always the case (Harvey and Butcher, 1998). In this research it is argued that it is important to establish an understanding of how to encourage and build confidence amongst staff members in order to provide ideas for updating the contents of an IS before proposing a suitable framework for OL. Continuously updating the contents of an IS would enable new information to be disseminated and would consequently initiate learning. Having a better understanding of how to involve staff members in an OL-based IS development reduces the probability of its failure later, thus saving money and time (Malhotra, 1997; Malhotra, 2004). This is due to the cost and time related to system development. Additionally, task improvements that stem from learning often reduce maintenance costs (Saint-Onge, 1996). Shanks and Olsen (1995) theorise that OL improves performance, enhances value and creates new beginnings.

The following two subsections discuss aspects of tacit knowledge and tacit knowledge externalisation and sharing. The discussion acts as a threshold for the analysis

of the existing OL frameworks in terms of obtaining ideas or inputs from the staff members. This discussion offers guidelines or criteria for analysing different frameworks, with regards to enabling a continuous IS update. The following subsection discusses what is meant by tacit knowledge within the context of this research. The subsequent subsection discusses the difficulty in the externalisation and sharing of tacit knowledge.

2.3.1 Tacit Knowledge

Tacit knowledge is "…being understood without being openly expressed" (Random House Dictionary of the English Language, 1971), or knowledge for which people do not have words. Tacit knowledge is automatic, requires little or no time or thought and helps determine how organisations make decisions and influence the collective behaviour of their members (Liebowitz and Beckman, 1998). The philosopher Polanyi (1967) describes tacit knowledge as knowing more than we can tell, or knowing how to do something without thinking about it, such as riding a bicycle. This highly personal, subjective form of knowledge is usually informal and can be inferred from the statements of others (Sternberg, 1997). Tacit knowledge tends to be local. It is not found in manuals, books, databases or files. This is because it is not transparent, easily visible but it is subjective.

However, one definition that is suitable to this research is given by Saint-Onge (1996): "Tacit knowledge is an individual's intuition, beliefs, assumptions and values, formed as a result of experience." An example of this could be a situation where a manager in a bus operating company is interested in determining the cost-effectiveness of introducing a new bus timetable. In this example, the manager will utilise his/her previous experiences in appraising the traffic conditions, buses and crews. Based on this understanding, the scheduling system is updated. Nevertheless, to complete that task, the manager must have the willingness to externalise previous experiences, have a meeting with staff members, consult the experts, obtain additional information from colleagues or share the strategy with the system officer. By accessing the new information in the bus schedule system, all the stakeholders, such as crews, management and schedule planners internalise new insights and consequently learn a new organisational approach.

Saint-Onge's (1996) definition implies that tacit knowledge is ingrained in an individual's mindset. Therefore, there is a need to motivate staff members to convey their tacit knowledge to others (Malhotra, 1997; Smith, 2001). By practising this, the

externalised or shared tacit knowledge can be discussed collectively and, ultimately, a consensus is made. This consensus in turn becomes a basis for improving tasks or creating cohesion in the workplace. Trivialising the process of externalising and sharing tacit knowledge, as argued by Saint-Onge (1996), will lead to conflict between staff members and inefficiencies in an attempt to achieve organisational goals. Regarding the above example, the conflicts could be that the crews are not satisfied with the schedule, there is no coherency in the bus service, local governments are unhappy with the quality of services, and the schedule is frequently altered.

It can be learnt from the above discussion that the heart of tacit knowledge externalisation and sharing is through the encouragement and confidence to undertake it. Therefore, understanding the capability to externalise and share tacit knowledge is much more critical in enabling OL-based IS development.

2.3.2 Understanding the Difficulty in Tacit Knowledge Externalisation and Sharing

Externalising and sharing tacit knowledge is a difficulty as this is a subjective notion. This subsection presents some factors that prevent staff members from externalising and sharing their tacit knowledge. This discussion will be used to justify the need to obtain an internal confidence in externalising and sharing tacit knowledge.

Tsoukas (2002) argues that obtaining tangible tacit knowledge is unsustainable. This is due to the ineffable nature of tacit knowledge, thus reducing it to what can be articulated. However, this issue does not mean that the ways of talking, fresh forms of interacting and novel ways of distinguishing and connecting cannot be developed (ibid). This research tries to contribute in this aspect by introducing the concept of meta-abilities.

To further illustrate the difficulty in tacit knowledge externalisation and sharing, this research utilises the elements that prevent individuals from being involved in the organisational development process. This is because the organisational development process is also related to the willingness to learn or change amongst staff members. Many researchers in the organisational development area (Burgoyne, 1988; Schroder, 1989; Pedler *et al.*, 1994; Goleman, 1995; Butcher *et al.*, 1997) feel that there are two major stumbling blocks in involving individuals in the organisational development process: (1) the difficulty of individuals to externalise and share their tacit knowledge (Harvey and Butcher, 1998); and (2) the difficulty of individuals to obtain information from their

colleagues (Butcher *et al.*, 1997; Harvey and Butcher, 1998). As a result, it is argued that obtaining input from the staff members for a continuous IS update and in turn creating a learning environment is not an easy task (Malhotra, 1997). The discussion of those difficulties is dealt with in the following two subsections.

Difficulties in the Externalisation and Sharing of Tacit Knowledge

As mentioned above, because the learning process occurs in an individual's mind, new knowledge always exists in the form of tacit knowledge (Churchman, 1971; Beveren, 2002). Tacit knowledge that resides in the individual brain is highly personal, hard to externalise and hard to share (Tsoukas, 2002).

Haldin-Herrgard (2000) found that the difficulty of externalising and sharing tacit knowledge is related to perception, language, time, value and distance. This difficulty exists due to the nature of tacit knowledge, which is transparent and subjective (Augier and Vendelo, 1999). Perceptually, the characteristics of unconsciousness entail a problem in that people are not aware of the full range of their knowledge (Polanyi, 1958). This is because tacit knowledge is internalised to such a point that it has become a natural part of people's behaviour or way of thinking (Haldin-Herrgard, 2000). Difficulties with language are attributable to the fact that tacit knowledge occurs in a non-verbal form; thus, intangible and difficult to observe and measure (ibid). It is argued that to articulate something that seems natural and obvious is a challenge for most people (ibid).

Time also poses to be a difficulty in the externalisation and sharing of tacit knowledge. When forming knowledge, the internalisation of tacit knowledge requires a long time, for both the individual and the organisation (Augier and Vendelo, 1999; Bennett and Gabriel, 1999). Contrastingly, rapid changes in the environment require a faster cycle of tacit knowledge externalisation and sharing (Haldin-Herrgard, 2000). The gap that exists between these two extremes in turn causes difficulties when undertaking the process of externalising and sharing tacit knowledge (ibid). The difficulty in value lies in the fact that tacit knowledge is not valuable enough to be shared (ibid). This is due to the many forms of tacit knowledge, such as intuition and rule-of-thumb (Zack, 1999). Distance also raises difficulties in today's work-life. This is due to the need for face-to-face interaction that is often perceived as a prerequisite for the externalisation and sharing of tacit knowledge (Holtshouse, 1998; Leonard and Sensiper, 1998).

The tacit knowledge that resides in an individual's brain suffers from the above difficulties (Haldin-Herrgard, 2000). The failure to overcome such problems causes the accumulation and consequently the embedding processes of tacit knowledge into an IS to become ineffective and inefficient (ibid). This in turn reduces the relevancy and reliability of disseminated information, which then makes it incapable of promoting continuous OL (Srikantaiah and Koenig, 2000). To face such difficulties, it is argued that individuals need to have internal strengths, such as self belief, commitment, enthusiasm and perseverance (Butcher *et al.*, 1997). Individuals who are not equipped with these internal strengths will become passive in terms of their motivation and contribution towards organisational prosperity (ibid).

The above discussion intends to highlight the importance of internal strength and personal confidence in enabling tacit knowledge externalisation and sharing. The above discussion presents a brief summary of what is theoretically known to be a stumbling block for tacit knowledge externalisation and sharing (Haldin-Herrgard, 2000). In practice, this stumbling block may not be considered or handled appropriately (Harvey and Butcher, 1998). The following sections will discuss the existing frameworks as tools for overcoming the above stumbling block. Before this, the next subsection discusses the difficulties in obtaining information from colleagues.

Difficulties in Obtaining Information from Colleagues

Harvey and Butcher (1998) found that there are many factors preventing individuals from obtaining information from colleagues within an organisation. These include anxiety, lack of confidence, unwillingness, confusion and being carried away by strong feelings. The main factor behind all these is the difference in superiority. It is usually a large problem for a subordinate to meet and discuss organisational tasks in an informal way with his or her superior. This is due to an inferiority complex that exists in an employee's heart and mind (ibid). Organisational hierarchy is another factor that widens the gap between junior and senior staff members in an organisation. This is due to the nature of human beings being attracted to a group that has similar backgrounds, such as age, race, gender and others (Ali, 1998). If this situation is not overcome, it will further discourage a harmonious relationship to grow between staff members and ultimately impede them from communicating with each other (Bennett, 1998). This results in the

process of externalising and sharing tacit knowledge, and would ultimately lead to learning becoming ineffective and slow within the organisation (ibid).

Another element that discourages active communication between staff members is the dissemination of information (Bennett, 1998). Some individuals feel that their opinions will not be accepted due to their positions within the organisation or that they do not have enough of an influence to provide a significant contribution to the organisation (ibid). This apprehension forces them to keep their knowledge or skills in their own mindset and results in the individuals becoming passive in formal meetings and undertaking sole tasks (ibid). This phenomenon discourages the externalisation and sharing of tacit knowledge amongst staff members (ibid). As a result, the learning process between the staff members becomes inactive and inculcates self-interest attitudes among the workers (ibid).

The above discussion presents, in general, the main factors for consideration when trying to externalise and share tacit knowledge. These factors have been suggested by Haldin-Herrgard (2000), Harvey and Butcher (1998) and Bennett (1998). Previously, each of those aspects was briefly discussed and critiqued. The following subsection reflects upon one of the problems mentioned in Chapter 1; that is, how to make tacit knowledge tangible. By having a tangible tacit knowledge, it becomes necessary for the staff members to document their views or solutions to a problem.

2.3.3 Understanding How to Obtain Tangible Tacit Knowledge

The previous subsection discusses the importance of tacit knowledge externalisation and sharing for the continuous update of an IS. This subsection stresses how important it is that an organisation's members document externalised and shared tacit knowledge. Within an organisation, there is more than one department. Each department consists of several operational units and each unit has many members. Every member has talents that can be used for organisational development (Manogran and Liang, 1998). However, talents are often lost when the individual possessing them leaves the organisation. What is required is a tool that can retain knowledge in the organisation even though the possessor leaves (ibid). This research proposes the concept of self-documentation. Documented knowledge or skills can be coded and stored in the database (Haldin-Herrgard, 2000). This documented, coded and stored knowledge can be termed "tangible knowledge" because it can be seen, read, measured and evaluated in the meeting

(ibid). Nonaka and Takeuchi (1995) use the term "explicit knowledge" to represent this documented, coded and stored knowledge. In the IS area, the coded and stored knowledge is usually referred to as information (Churchman, 1971; Beveren, 2002). These three terms are used interchangeably in this research to represent the externalised tacit knowledge.

The importance of having a good documentation process is to make tangible all the points that are intangible (Karhu, 2002). Usually, having such intangibility causes the existence of unnecessary misunderstanding between the staff members. This in turn causes the existence of unnecessary problems either throughout the process of decision making or from actions taken based on those decisions (ibid). These types of problems might disappear if such intangibility is transformed into a tangible form. This is because tangible ideas can be scrutinised in the meeting (ibid). It is important to have a good documentation on the externalised and shared tacit knowledge and good approaches to enhance this documentation amongst staff members (ibid).

To summarise, it can be said that tacit knowledge externalisation and sharing is the most important platform to gain inputs from individuals. Tacit knowledge externalisation and sharing is in itself divided into two levels. The first level is understanding the ability and strength to externalise and share tacit knowledge. The other level is making tangible the tacit knowledge through the self-documentation process.

Having defined and described the relationship between learning-based systems and tacit knowledge but not the existing OL-based IS frameworks, which is an important aspect of this research, the next section will describe and define the existing OL-based IS frameworks. The section presents a discussion about the different frameworks used for developing learning-based systems in an organisation. The discussion also includes the abilities of such frameworks and approaches in establishing the externalisation and sharing of tacit knowledge, and the documenting of this externalised and shared tacit knowledge by staff members. It is worth noting that the frameworks provided in the following discussions are the ones most commonly used in OL and are by no means all of the tools used for developing learning-based systems in the organisation.

2.4 Understanding Frameworks in Organisational Learning

The concept of frameworks in OL has been briefly discussed in Chapter 1. The main theme of this discussion is the frameworks used in developing a learning-based

system and the main problems related to this area. By undertaking this review, lessons regarding the ineffectiveness of the process can be learnt. This chapter reviews the issues existing in relation to tacit knowledge externalisation and sharing, and the difficulties involved in externalising and sharing tacit knowledge that were mentioned in the previous section. The objective of this is to explore ways of using frameworks for tacit knowledge externalisation, sharing and ultimately documentation amongst staff members.

This section describes the OL frameworks and methods of accumulating tacit knowledge. The discussion concentrates on the relationship between these tools and the theoretical information in the previous section, rather than the technicalities of such frameworks. The following two subsections present the existing frameworks used for learning-based systems and the methods of accumulating tacit knowledge.

2.4.1 Frameworks in Organisational Learning

Argyris and Schön (1978) define OL as the process of detection and correction of errors. Based upon this understanding, it is argued that organisations learn through individuals, who act as agents for the organisations. An individual's learning activities, in turn, are facilitated or inhibited by an ecological system of factors that may be called an organisational learning system (ibid). Argyris and Schön (1978) highlight a close relationship between an organisation and its staff members in order to establish an effective OL. However, it is assumed that staff members are willing to interactively learn and change, which is not always the case in a practical situation (Harvey and Butcher, 1998).

Senge (1990) defines an LO as an organisation "in which you cannot not learn because learning is so insinuated into the fabric of life." Additionally, an LO is defined as "a group of people continually enhancing their capacity to create what they want to create." However, this aspiration gradually diminishes if there is no teamwork amongst the staff members. In this case, it is essential to instil a willingness to work together or communicate with each other amongst the staff members before learning environments can be created.

Huber (1991) considers four constructs as integrally linked to OL: (1) knowledge acquisition; (2) information distribution; (3) information interpretation; and (4) organisational memory. Huber's (1991) knowledge acquisition stage particularly

emphasises the importance of tacit knowledge externalisation and sharing. This stage also highlights the role of documentation to make the tacit knowledge tangible. Contrastingly, the third stage represents the internalisation process where staff members learn or gain new insight from obtained information. The second stage illustrates the role that IS can play as a means for promoting the learning environment and the fourth stage represents the continuous IS re-examination and modification so that the system is learning-enabled. Due to the systematic ways of developing OL-based IS, this framework becomes the basis for this research framework. However, Huber's (1991) framework is built on the belief that staff members have self-confidence, a sense of responsibility and feelings of belonging to the company in order to externalise and share their tacit knowledge. As a result, this framework has a potential to fail if there is no commitment from the staff members to support it. To overcome this issue, this research will incorporate the concept of meta-abilities in the learning-based systems developmental framework.

Weick (1991) argues that the defining property of learning is the combination of the same stimulus and different responses; however, such a combination is rare in organisations because organisations either do not learn or, if they do learn, it is attributed to non-traditional methods. In this case, it is noted that "Perhaps organisations are not built to learn. Instead, they are patterns of means-ends relations deliberately designed to make the same routine response to different stimuli, a pattern which is antithetical to learning in the traditional sense" (Weick, 1991, p.119). In other words, OL involves a different kind of learning than has been described in the past as "the process within the organisation by which knowledge about action-outcome relationships and the effect of the environment on these relationships is developed" (Duncan and Weiss, 1979). Based on this understanding, Weick (1991) observed that a more radical approach would involve individual learning being undertaken by people offering a different response to the same stimulus. However, OL occurs when groups of people give the same response to different stimuli and anxiety, lack of confidence, unwillingness, confusion and being carried away by strong feelings can prevent this scene from becoming a reality.

DiBella (1995) makes a case for understanding LO using normative, developmental and capability perspectives. The normative view, typified by Garvin (1993) and Senge (1992), supports the notion that learning is a collective activity. In this case, the ability to externalise and internalise knowledge must be present to ensure learning. This perspective

requires some form of managed leadership in order to achieve learning. The developmental perspective considers evolutionary changes and learning through ongoing interpretations of experience. Organisations pass through developmental stages in order to learn. Another view considers developmental learning as movement from rote memorisation to the understanding of concepts, integration of ideas and finally synthesis of new ideas. A capability perspective posits that there is no one best way for organisations to learn. According to this perspective, learning processes are embedded in an organisational structure and culture. Learning occurs through self-discovery and reaffirmation. As new models are presented to the system, it considers their fit and revises its world view accordingly. These outlooks of OL still maintain the assumption that an individual is a perfect entity to enable learning. Those outlooks are far from being reached, especially if there is no active involvement from the staff members.

Klimecki and Lassleben (1998) conceptualise OL as a communicated-based process where the organisation overcomes its previous boundaries of knowledge and ability by allowing its members to share knowledge, interact and influence each other and cope with difficult situations. Combining Huber's (1991) and Klimecki and Lasslebens' (1998) perspectives, Nonaka and Takeuchi (1995) see OL involving the generation, absorption and sharing of tacit knowledge and they emphasise the importance of interaction amongst people towards the development of OL capabilities. In other words, OL is the process of continued innovation through the creation of new knowledge (Nonaka and Takeuchi, 1995; Quinn *et al.*, 1996). It is an ongoing process that takes place as staff members engage in knowledge work (Davenport *et al.*, 1998). These views illustrate the importance of having continuous IS updates through the medium of communication amongst staff members. However, to enable the communication process, staff members have to be self-confident and be encouraged to talk to others in the workplace. Lack of confidence and anxiety will demotivate an individual from communicating with others and consequently reduce the effectiveness of the framework.

Meso and Smith (2000) argue that learning emanates from the iterative process of knowledge externalisation and internalisation. Externalisation occurs when an individual's tacit knowledge is captured as explicit knowledge. Internalisation occurs when this captured explicit knowledge is then transformed into another individual's tacit knowledge. In this case, OL occurs at the intersection of tacit and explicit knowledge during the

interaction of various staff members, departments or teams in an organisation. However, this framework still relies on the ability of staff members to externalise and internalise knowledge.

In summary, the capability to externalise and share tacit knowledge is of paramount importance for OL frameworks. This in turn illustrates that staff members should be instilled with that capability. Therefore, at this point it is declared that individual development should become the starting point in an OL-based IS developmental framework. This research intends to use this reasoning to illustrate the role of meta-abilities in OL.

2.4.2 Previous Methods of Accumulating Tacit Knowledge

The previous subsection discusses the issue of tacit knowledge externalisation from the OL perspective. This subsection stresses the importance of documenting the externalised and shared tacit knowledge by staff members. This issue is highlighted because one of the stages in an OL framework is knowledge acquisition (Huber, 1991). This stage concerns a process of accumulating tacit knowledge. Therefore, understanding tacit knowledge accumulation is also needed in developing an effective OL framework.

In the past few years, authors have suggested several methods of obtaining tangible tacit knowledge. Nonaka and Takeuchi (1995) created a model of knowledge conversion. This model consisted of four modes: socialisation, externalisation, combination and internalisation in an ongoing circular movement. According to Nonaka and Takeuchi (1995), tacit knowledge is made explicit by an analogy or metaphor, or the creation of concepts or hypotheses. It is argued that gaps and discrepancies in these attempts to articulate tacit knowledge frequently prompt further reflection and continuing dialogue and interaction. However, this approach does not deviate from obtaining information by using a formal tool. As a result, this approach will only generate structured information. In contrast, due to its nature, tacit knowledge is usually externalised and shared in a creative and spontaneous manner (Smith, 2001). Therefore, this approach is still incapable of effectively making the tacit knowledge tangible.

One school of thought proposes interview sessions as the preferred method of externalising tacit knowledge. Brooking (1998) argues that interviews should focus on capturing the processes used by experts and documenting assumptions and conclusions in

certain situations. Sveiby (2001) suggests that tacit knowledge should be shared with the help of dialogues and debates. Trust is the most important element during the interview sessions (Von Krogh *et al.*, 2000). Karhu (2002) uses interviews as the means to accumulate tacit knowledge in her expertise cycle framework. It is argued that the process becomes more effective by employing "knowledge stewards." Knowledge stewards are responsible for acquiring, constructing and transferring the proficiency of experts in the organisation. However, the feedback from the interviewees will also be limited to the number of question asked. Contrastingly, staff members generate multiple and contradictory viewpoints that are necessary for meeting the challenges posed by rapidly changing environments. This scenario illustrates that interviews cannot become an effective way to make tacit knowledge explicit.

An alternative method to externalise tacit knowledge and values is narration or story telling (Stewart, 1997; Wah, 1999; Linde, 2001). Narrations are the representation of past events in any medium: narratives can be oral, written, filmed or drawn (Linde, 2001). Narrations are considered beneficial as they are suitable to reach and convince large amounts of people. Narratives can also involve techniques such as interviewing, observing and creating the trust to acquire information that will be used for the stories (Snowden, 1999). Another example of a narration is a knowledge exchange protocol. A knowledge exchange protocol is a process that structures information exchange in such a manner that the provider of the information and/or the recipient of the information can systematically present and recall information in a focused manner (Herschel *et al.*, 2001). However, narration will only make staff members think and articulate systematically the best actions that are used to tackle one problem. This phenomenon is only suitable for a stable and predictable professional practice. Therefore, in a rapidly changing environment, this approach becomes ineffectual at accumulating tacit knowledge.

The repertory grid is another method utilised to make tacit knowledge explicit (Stewart and Stewart, 1982; Jankowicz, 2001). Under this technique, tacit knowledge is externalised using consecutive steps, starting from identifying the possible solutions through to writing the final decision. However, this approach still falls under the systematic regime of accumulating tacit knowledge. This in turn contradicts the nature of tacit knowledge, which is usually externalised and shared in a creative and spontaneous manner.

In summary, the above methods can only elicit tacit knowledge that is used to manage oneself, others or one's tasks. Also, individuals have to think and articulate systematically the best actions that are used to tackle one problem. However, this phenomenon is only suitable for a stable and predictable professional practice. In a rapid changing environment, professional practice is always different from theoretical knowledge (Argyris and Schön, 1978). This is because staff members keep learning new organisational approaches when undertaking their tasks. These new organisational approaches are normally experienced in a creative and spontaneous manner due to a desire to create the most innovative and economical approach. It is argued that systematic tacit knowledge articulation and sharing is not capable of appreciating such creative and innovative practices because it occurs unplanned and in a sudden manner. Due to tacit knowledge's subjective and transparent characteristics, the most critical element that should be considered is to let staff members document their own ideas, opinions, findings or experiences. This research terms this process as self-documentation.

However, to enable self-documentation, staff members must be encouraged, confident and have a sense of responsibility and belonging to the company. All these internal values will enable individuals to obtain opinions from other colleagues. Therefore, at this point it is also declared that individual development should become the starting point for the self-documentation process.

2.5 Learning-Based Systems and Meta-Abilities

This section goes into more detail regarding the elements that can be used to develop staff members' abilities to externalise, share and document their tacit knowledge. As mentioned earlier, ignoring humanistic elements can reduce the effectiveness of an OL framework. Understanding the ability to externalise, share and document tacit knowledge enables an organisation to undertake continuous IS updates and consequently disseminate new insights for learning. The following subsection presents an overview of meta-abilities that will be used as a means for developing staff members' abilities to externalise, share and document tacit knowledge. The subsection after that discusses the elements that will be used to develop meta-abilities in this research.

2.5.1 Overview of the Meta-Abilities

As stated above, in a true LO, strategies for survival and growth would be informed by the judicious use of accumulated experience (Argyris and Schön, 1978). In this case, no intervention would be required. However, one of the great impediments to this is the lack of clarity about the nature of competence (Collin, 1989; Pye, 1991; Butcher *et al.*, 1997). This is because it is extremely difficult to capture the essence of effective working styles through interminably detailed lists of behaviour and skills or through poorly defined general labels such as "leadership" or "influencing." It is also clear that just training individuals in specific skills is no guarantee that the skills will be used appropriately. As mentioned above, many factors prevent individuals from using their knowledge and skills – lack of confidence, unwillingness, being carried away by strong feelings and other distractions. These inhibit a learning capability and deter individuals from recognising when new skills are to be learnt.

To develop an organisation, it has been suggested that competencies should be generic rather than organisation specific (Butcher *et al.*, 1997). Additionally, competencies cannot be usefully specified in terms of neatly identifiable, observable or measurable behaviours. Therefore, competencies should involve increasing self-knowledge and improving "meta-abilities" – those personal, acquired abilities which underpin and determine how and when knowledge and skills will be used (Butcher *et al.*, 1997).

Butcher *et al.* (1997) found that there are four meta-abilities that are critical in organisational development: (1) cognitive skills; (2) self-knowledge; (3) emotional resilience; and (4) personal drive. The description of each meta-ability is given in Table 2.1.

Atkinson (1999) found that the concept of meta-abilities was also central in managerial development. In this case, the prerequisites for managerial development are as follows: (1) a focus on the development of meta-abilities; (2) a period of discomfort, where inappropriate behaviours can be examined and unlearned; (3) a focused transition which moves the individual towards the most pertinent of objectives and (4) an understanding of how these abilities are used in the context of an organisational agenda.

Table 2.1 The description of meta-abilities

Meta-abilities	Description
Cognitive skills	Includes the ability to notice and interpret what is happening in interpersonal situations; to entertain multiple perspectives and integrate them; to envision strategic futures; and to sort and analyse data. These skills allow organisational members to "read situations, understand, and resolve problems."
Self-knowledge	Seeing oneself through another's eyes, knowing one's own motivations, and values and distinguishing one's own needs from those of others. These skills allow organisational members to consider a range of options in their own behaviour and to make better judgements of what to do. They allow other skills and knowledge to be used more flexibly.
Emotional resilience	Includes self-control and discipline; the ability to use emotion well to cope with pressure and adversity; and balance feelings about oneself. These skills allow organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily.
Personal drive	This involves self-motivation and determination, a willingness to take responsibility and risks. This helps organisational members to persist, motivate others and meet targets.

Source: Butcher *et al.* (1997)

As this research focuses on humanistic elements for OL and as organisational and managerial development are related to learning processes, the concept of meta-abilities needs to be emphasised for the following reasons. Cognitive skills represent staff members' self-confidence, encouragement and willingness to utilise their knowledge and skills effectively. This utilisation involves sharing views with others, obtaining additional information for clarification, proposing solutions to a problem in a formal meeting and having a clear picture on what should be achieved in the future. The description of self-knowledge illustrates that it is if of paramount importance in understanding a rapidly changing environment. As the reason for creating learning environments is to cope with changes in the business environment, this ability has the potential to be considered. Contrastingly, the values of emotional resilience are related to self-confidence and a willingness to utilise knowledge and skills effectively. Personal drive helps staff members to have the willingness and sense of responsibility to externalise and share knowledge in order to establish a learning environment. In short, these values have potential to motivate staff members to participate in learning processes and should therefore be considered when developing an effective OL framework.

There is no research that incorporates meta-abilities in OL or IS areas. Additionally, as the failure of IT-enabled OL was partly contributed by humans (Malhotra,

2004), research into the best ways of including staff members in learning-based system becomes necessary. However, the meta-abilities developmental strategy that was applied in this research was different from that of Butcher *et al.* (1997). The discussion of this is dealt with in the following subsection.

2.5.2 Elements for Developing Meta-Abilities

This subsection introduces the elements that are employed by this research to develop meta-abilities. The elements are developed by referring to several IS and business management literatures. Before that, this subsection discusses the developmental strategies that were employed by Butcher *et al.* (1997) in order to develop meta-abilities. The descriptions of these strategies are summarised in Table 2.2.

Table 2.2 The developmental strategies of meta-abilities

Meta-abilities	Developmental strategies
Cognitive skills	Cognitive complexity – explore the complexities of business issues through models and case studies, and demonstrate variety in problem solving approach Cognitive flexibility – encourage involvement of the participants in the classroom and let them to experience new functional perspectives in the discussion Visionary ability – participants are encouraged to consider their own impact and that of others in a wider context Perceptual acuity – process debriefs of group exercises and sharing of perceptions Gaining clarity – the analytical process used throughout the business discussions, case studies, simulations, group work or personal reflections
Self-knowledge	Personal reflection – analysing one's role and evaluating one's performance; or of becoming clearer about the personal values and motivations which drive certain types of behaviour Personal feedback – formalised instruments or questionnaires, such as personality or leadership inventories
Emotional resilience	Taking different and wider perspectives, critical analysis, self-examination in the light of feedback, understanding emotional reactions during exercises or other activities and help individuals to appreciate how to manage emotions appropriately
Personal drive	Intellectual challenge through the use of insightful questions, pointed feedback, role modelling and the examples of other delegates

Source: Butcher *et al.* (1997)

From Table 2.2, it can be seen that Butcher *et al.* (1997) developed meta-abilities through the use of active interactions between tutors and participants. This type of interaction is similar to apprenticeship where an individual is coached in mastering particular skills. The given justification was that meta-abilities cannot be developed through acquisitive incremental learning, but rather through a process of personal

transition which involves gaining self-insight and unlearning old habits in the face of new management challenges (ibid). However, there exists the possibility that the individuals will be confused about how to utilise their knowledge and skills in problematic situations as there is no platform in their mindsets or benchmark measure to refer to (Manogran and Liang, 1998). This confusion can demotivate staff members from using their knowledge and skills and can lead to reduced willingness to externalise, share and document them.

Therefore, to accommodate the requirement of the previous research, which is to instil confidence and willingness to externalise, share and document knowledge, this research proposes the following elements in order to develop the above meta-abilities: (1) understanding organisational roles; (2) internal strengths; (3) formal and informal discussion and (4) rational discourse. This is because all these elements are more focused upon developing the staff members' communication skills, assertiveness and dealing with conflict, persuading others and managing organisational politics, which are relevant to achieve the objective of this research. The definitions and descriptions of each element are provided in the following subsections.

Understanding Organisational Roles

This research argues that staff members need to understand three fundamental aspects when working in the organisations: (1) personal responsibility; (2) task priority and (3) personal targets (Barham and Rassam, 1989; Burgoyne, 1988; Schroder, 1989; Morgan, 1989; Drucker, 1992; Butcher *et al.*, 1997; Harvey and Butcher, 1998). First, staff members need to realise that behind every single penny that they earn from the company is the responsibility that need to be fulfilled (ibid). When recruited, an individual must be grateful to his/her organisation (ibid). This acknowledgement should be followed by an inspiration to work hard and smartly for the sake of the company (ibid). Moreover, every organisation expects its members to significantly contribute to its continuous development (ibid). In short, staff members must embed this understanding in their mindsets so that the motivation to work diligently and thoroughly in the organisation always exists (ibid). This in turn creates willingness amongst staff members to accept changes, as long as the changes are beneficial to the company (ibid). In other words, understanding personal responsibility can create an active learning environment in the organisation (Stewart, 1997). The inspiration to always contribute to the company's development makes this value applicable when developing an individual's emotional resilience and personal drive.

Second, staff members must be able to prioritise organisational tasks (Butcher *et al.*, 1997). To ease the process of understanding task priority, staff members can divide tasks into major or minor categories (Earl and Hopwood, 1980). Major tasks include the superior's instructions and operational tasks. Minor tasks are ceremonial committee and union affairs. In this case, staff members must be clear about their job specifications so that they will not waste time on tasks that do not contribute to performance recognition (ibid). Major tasks must be given a higher priority than minor tasks. As this value enables staff members to arrange their organisational tasks and working time, its impact on cognitive skills, self-knowledge and personal drive is expected to be significant (Butcher *et al.*, 1997). As a result, this ability is relevant in developing an individual's meta-abilities (ibid). Additionally, as this requires staff members to evaluate tasks in greater depth, the process of learning occurs directly or indirectly in their mindsets (Tsoukas and Vladimirou, 2001). Therefore, this understanding should be emphasised when developing effective OL frameworks.

Finally, staff members need to be clear about their organisational aims and targets in a period of time. Working without aims or targets is like "a blind person touching things in a dark room" (Butcher *et al.*, 1997; Manogran and Liang, 1998). Aims and targets should be developed to shed light on how to monitor organisational activities and determine future directions (ibid). This enables an understanding which assists staff members to effectively navigate the difficult and dynamic organisational reality (ibid). Therefore, this understanding is relevant in developing an individual's cognitive skills, self-knowledge and personal drive (ibid). As this understanding promotes the judicious use of accumulated experience, it is beneficial when considering learning activities and was therefore adopted in this research.

Internal Strengths

This research proposes eight internal strengths that should be instilled to staff members in order to develop meta-abilities and thus establish a learning environment, which are as follows: (1) personal confidence; (2) observing accepted organisational approaches; (3) undertaking tasks with commitment and self-discipline; (4) self-awareness; (5) self-remembrance; (6) compassion; (7) sincerity; and (8) willingness to change. These eight internal strengths were selected because they enable the use of knowledge and skills in an effective manner (Goleman, 1995; Butcher *et al.*, 1997; Malhotra, 2004). However,

this research upholds the view that the proposed internal strengths are not representing all the elements required in the OL area. Nevertheless, being equipped with those elements enables staff members to determine how and when knowledge will be practised within the organisation, which is critical to the learning process (Butcher *et al.*, 1997). The definitions and descriptions of each value are offered in the following paragraphs.

The first internal strength that is proposed in this research is ***personal confidence***. The importance of personal confidence in the workplace has been highlighted and described in previous literature (Pedler *et al.*, 1994; Butcher *et al.*, 1997; Harvey and Butcher, 1998). Personal confidence is a self-belief in undertaking and accomplishing organisational tasks (ibid). Based on this understanding, this research argues that every task must be begun with personal confidence. As Manogran and Liang (1998) stated, "a thousand steps in the future begin from a single step". However, the first step must be inspired with the belief that "I can start my first step." For example, when considering a climber of a coconut tree, it would be reasonable to assume that the first thing that would appear in his mind is "Can I climb this coconut tree?" If he is confident enough, he will say "I can do this job" and, as a consequence, will start using his skill and energy to climb the coconut tree. However, if he is not confident, he will leave the coconut tree. As one of the elements that prevent staff members from externalising and sharing their tacit knowledge is lack of confidence (Harvey and Butcher, 1998; Haldin-Herrgard, 2000), this element should be emphasised when understanding an OL framework. Additionally, as this value portrays an intimate relationship with the determination to undertake tasks, it is applicable in developing a personal drive.

The second internal strength proposed in this research is ***observing accepted organisational approaches***. Burgoyne (1998) describes this value as "meta-competencies" which allows individuals to create and adapt specific competencies for specific situations. By observing accepted organisational approaches, staff members can undertake tasks based upon "the right approach for the right situation" (Barham and Rassam, 1989; Burgoyne, 1988; Schroder, 1989; Morgan, 1989; Drucker, 1992). This action in turn enables cost, time and energy savings (ibid). For example, referring back to the above coconut tree climber; to ensure the success of the climbing process, the climber needs to be familiar with the appropriate climbing method and tools. To assist him in this process, the climber can ask a climbing expert for guidance and advice. By internalising the guidance and

advice, the climber becomes aware of the best strategy in accomplishing his mission. This in turn reduces the climbing failure risk. As this internal strength promotes sharing information with, and obtaining clarification from, other parties, it needs to be emphasised in creating a learning environment (Karhu, 2002). This value is relevant to build up an individual's cognitive skills and self-knowledge because it promotes the ability to determine the right action at the right time (Barham and Rassam, 1989; Burgoyne, 1988; Schroder, 1989; Morgan, 1989; Drucker, 1992).

The third internal strength discussed here is ***undertaking tasks with commitment and self-discipline***. Schroder (1989) stresses the importance of this value when creating effective individuals. The most important thing that every staff member has to bear in mind in the workplace is that "we must do the job" (ibid). The main objective of an organisation when recruiting people is to assist management in the maximising of its profits (Manogran and Liang, 1998). Therefore, staff members must perform organisational tasks with commitment and self-discipline. Without these values, staff members tend to undertake a job hastily and carelessly. This in turn will badly affect the quality of organisational operations (ibid). In the case of the above coconut tree climber, he must possess the willingness and commitment to climb a tree. His effort in climbing the tree is the most important part of the whole climbing process. A reluctance to climb causes the climber to fail from gaining an outcome for the coconut sale. In short, this internal strength is the backbone of enabling knowledge and skills utilisation amongst staff members. Therefore, this internal strength has the potential to enable a learning process thriving within the organisations. As this value makes staff members become more concerned with organisational achievements, it is suitable in instilling emotional resilience and personal drive.

The fourth internal strength is ***self-awareness***. Pedler *et al.* (1994) describe this as a process of managing the inner processes of thinking, feeling and willing. Butcher *et al.* (1997) highlight the similarity between self-knowledge and self-awareness. In the research by Butcher *et al.* (1997), self-awareness is defined as "an ability to determine the tasks that need to be accomplished at the current time and accomplish the determined tasks according to an accepted organisational approach." In other words, it is related to the phrase "do the right things at the right time" (ibid). This definition is used to enable staff members to cope effectively with rapid changes in their organisational life and environment. For instance,

self-awareness causes the climber to consider three elements before climbing the tree: (1) to ensure that the climbing task is the most important one to be accomplished at that particular of time; (2) to be aware of the best approach when climbing a coconut tree, and (3) obtain the most suitable coconut in order to obtain the best value. These processes involve actively sharing and externalising knowledge and obtaining a clarification process from others. Therefore, self-awareness is a relevant consideration when establishing an effective OL framework and is pertinent for self-knowledge development.

Self-remembrance is the fifth internal strength. In this research, self-remembrance is defined as "the value that requires staff members to mind their actions when undertaking a task so that it can be accomplished effectively and to remember that through their effective actions the company can achieve a good profit and consequently give them a good salary and bonus" (Schroder, 1989; Manogran and Liang, 1998). The combination of these two values can motivate a person and others to work hard and smart. For example, the coconut tree climber must always remember that he needs to climb the tree carefully so that he can reach the top. At the same time he should remember that, if he can reach the top part of the coconut tree, he can obtain a coconut and consequently earn an income from that. From this description, it can be seen that self-remembrance enables staff members to actively utilise their knowledge and skills in the process of decision making. Therefore, this internal strength is applicable in the process of creating an environment conducive for learning. As this value promotes understanding of self and organisation, it can be linked to self-knowledge development.

The sixth internal strength is ***compassion***. Schroder (1989) describes this value as self-control. In this research, compassion is defined as having "a feeling that the whole organisation is like a family" (Fitz-Enz, 1997). Each staff member should appreciate the other members' efforts because all of them have the same aim and objective in terms of job security. All the staff members should learn how to co-operate and collaborate with one another so that they can work in harmony. For example, the coconut tree climber should not have the intention of using the coconut as a means of violence. That is, hitting a co-worker on the head so that he can have all the money. On the other hand, the co-worker should not have the intention of running away with the coconut in order to have all the money only for himself, either. Both parties should feel able to share the benefit of their work fairly. Being equipped with this value, staff members can trust each other and

consequently neutralise the feeling that prevents them from sharing information with other members. This situation is critical in establishing a learning environment and therefore needs to be considered in this research. Due to its relationship with self-control, compassion becomes applicable to develop an individual's emotional resilience and personal drive.

The seventh internal strength is ***sincerity***. This is the most important intrinsic value that should be instilled in the workplace. Every staff member must have a feeling that he/she works for the sake of the company and for fulfilling his/her responsibility to the company. Failure to instil sincerity amongst the employees results in dissatisfaction and annoyance with the company. As a result, the working spirit decreases on a daily basis. In the case of the coconut tree climber, without sincerity he might have a tendency to pluck the wrong coconut and this would result in the consumers not obtaining quality products and services. Due to this action, the co-workers would get annoyed and as a consequence would not trust him anymore. Sincerity can motivate staff members to work collectively and harmoniously in the workplace. This scenario is critical in creating a learning environment in the organisation and therefore should be emphasised in research. Relating to meta-abilities, this value is pertinent to emotional resilience and personal drive because it gives the strength to ignore sentiment-based elements, such as gossip and slander (Schroder, 1989).

Finally, staff members must have the ***willingness to change*** whenever the need arises. This is due to rapid changes in the organisational life and business environment. This process is like a continuous improvement in an organisation so that its competitiveness does not deteriorate. If the coconut tree climber does not retreat from the coconut tree, nobody will obtain a benefit. The co-workers on the ground do not obtain coconuts because the climber does not climb down from the top part of the coconut tree. On the other hand, the climber will not learn how to improve his climbing skills in the future, as he will not come down and learn of ways to achieve this. As willingness to change is related closely to learning, this value needs to be considered in this research. The continuous learning element causes this value to be applicable in developing cognitive skills and self-knowledge.

From the aforementioned discussion, eight internal strengths were considered to be relevant in developing meta-abilities in this research. These internal strengths can become

the elements that can be referred to in understanding situations and taking actions. Additionally, these values are related closely to OL; therefore, they should be instilled in staff members in order to establish a learning environment.

Formality and Informality

Another element that is proposed by this research when developing the meta-abilities is the ability to conduct formal and informal discussions within the organisation. This is because staff members face various tasks in daily activities – routine, non-routine, official and unofficial (Earl and Hopwood, 1980). To cope with this variety, the integration of formal and informal discussion in handling tasks becomes necessary (ibid). Formal approaches are procedures such as meetings, progress reports and performance evaluation reports (ibid). Informal approaches include dialogue, face-to-face interaction, corridor meeting, lunch table chats and coffee/tea table chats (ibid). In this case, each staff member must not be rigid when solving problems with other members (ibid). When equipped with the ability to conduct formal and informal discussions, it is argued that staff members can read situations, understand and resolve problems, and consider a range of options in a collective manner (Butcher *et al.*, 1997). These values are related to an individual's cognitive skills and self-knowledge (ibid).

Since the integration between formal and informal discussions can reduce the barriers in communication between staff members, its impact on learning is perceived to be significant (Earl and Hopwood, 1980). Through good communication, learning and teaching activities can be undertaken actively amongst staff members. Therefore, this value should be emphasised in order to create effective OL framework.

Rational Discourse

Whenever an IS is applied, it serves some human interests; therefore, the design choices are made to serve some interests at the expense of others and involve moral value judgements (Klein and Hirschheim, 1996). This means that practical advice concerning the design of a learning-based IS must not be limited only to technical aspects, but also address moral issues, such as what is good or bad, or right or wrong in any particular application. Therefore, there is a need to establish a platform to approach such value judgements in a rational way.

A rational discourse can legitimise the selection of a design ideal because it ensures that the arguments of all interested parties are heard, that the choice results in an informed consensus about the design ideal, and the formal value choice is only made by the force of the better argument (Klein and Hirschheim, 1996). These values are critical for developing the above cognitive skills and self-knowledge. In addition, they are able to promote active tacit knowledge externalisation and sharing amongst staff members, especially in meetings and dialogue. Therefore, rational discourse should be considered for establishing a platform in an individual's mindset for creating learning environments in an organisation.

From the aforementioned discussions, it is declared that the concept of meta-abilities in this research is developed based upon the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse. This is something that prior research such as that by Butcher *et al.* (1997) has not undertaken. Additionally, the concept of meta-abilities in this research is utilised for developing an effective OL framework and not organisational development, as proposed by Butcher *et al.* (1997). This strategy makes this research unique to that of Butcher *et al.* (1997).

2.5.3 Meta-Abilities and Learning-Based Systems Development

Reflecting on the above discussion, it can be seen that, initially, the development of meta-abilities is fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse. These values are argued to be capable of improving personal influencing skills and sharing attitudes, such as communication, assertiveness, dealing with conflict, persuasion and developing others.

It is therefore argued that meta-abilities offer a substantial contribution by making individuals more astute and insightful, able to make better judgements and to envision more alternative actions. As such, they are better equipped to navigate the difficult and dynamic organisational reality and influences effectively within the organisation. In this case, individuals are able to extend their personal sphere of influence and provide a more critical perspective. They provide greater insight and are more direct in focusing attention and asking significant questions. Consequently, they can influence subordinates, colleagues and management, serve as role models and be more challenging. This type of interaction can develop cohesiveness in the working place. In short, they act as a spur to

organisational development by influencing others, questioning implicit assumptions, exploring new possibilities and directing energies toward higher standards.

More importantly, as a result of their meta-abilities development, individuals implement significant change within their organisations (Harvey and Butcher, 1998). These changes range from introducing specific initiatives to realigning the culture and values of the organisation (ibid). Significantly, these changes are individually driven, at times fragmented actions, which succeed in creating subcultures, demonstrating new approaches and influencing attitudes within the organisation (ibid). They are underpinned, not by corporate control or widespread campaigns, but by an understanding of the complexity and political nature of the organisational influencing process (ibid). Above all, they are driven by self-belief, commitment, enthusiasm and perseverance (ibid). All these represent an individual's confidence, sense of responsibility and feeling of belonging to the organisation in dealing with any problematic situations within the organisation. The confidence, sense of responsibility and feelings of belonging to the organisation lead to the development of the willingness to externalise and share tacit knowledge.

Based on the above discussion, it can be learnt that meta-abilities can assist in building a confident and responsible individual (Harvey and Butcher, 1998). This can be learnt from these two competencies. First, meta-abilities can create individual influencing skills (ibid). Second, meta-abilities can develop individual sharing attitudes (ibid). As the problems of developing OL-based IS are founded on the need to develop an individual's ability to externalise and share of tacit knowledge, as discussed in the previous sections, the meta-abilities, influencing skills and sharing attitudes are the humanistic elements that can be considered. In other words, being equipped with these competencies, staff members can face the difficulties in the externalisation and sharing of tacit knowledge and in obtaining information from colleagues, and can consequently become the enablers of tacit knowledge externalisation and sharing. The combination of meta-abilities, influencing skills and sharing attitudes is termed as "the six competency sets" in this research. Brief descriptions of influencing skills and sharing attitudes are given below.

Influencing Skills

Since knowledge alone is of little use without the ability to use it to work with others and to influence situations, this competency set refers to the specific skills of overt individual effectiveness. These are grouped as follows (adapted from Butcher *et al.*, 1997):

- Core communication skills (which essentially underpinned all the skill groups)
- Assertiveness and dealing with conflict
- Persuading others and managing organisational politics
- Developing others (delegating, coaching, counselling).

Sharing Attitudes

This competency is related to the willingness to inform others about the need for changes or improvement. Therefore it is related to influencing skills in terms of the purpose of its action; that is, to convey ideas or information. However, its level of rigidity is not as high as influencing activities, since sharing means to convey ideas or information and not to force someone to accept or implement them. Nevertheless, both competencies have similar skill groups, as mentioned above.

By practicing the above influencing skills and sharing attitudes, individuals can generate creative ideas, actions, reactions and reflections (Nonaka and Takeuchi, 1995; Malhotra, 1997; Choudrie and Selamat, 2004). The terms ideas, actions, reactions and reflections represent forms of activities within an organisation. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS (ibid). However, it must be documented first. This can be achieved by the value of self-documentation, which is also developed by meta-abilities (Butcher *et al.*, 1997; Choudrie and Selamat, 2005). This is because, due to the development of meta-abilities, the willingness to question implicit assumptions, explore new possibilities and direct energies toward higher standards enables the staff members to be well prepared, using good documented progress reports or working papers (ibid). In this case, the development of meta-abilities can create the willingness amongst staff members to document their ideas, views or plans. All these self-documented facts in turn provide inputs for IS continuous update. The updated contents property enables the system to disseminate relevant information and ultimately establish a learning process.

2.5.4 Meta-Abilities, Learning-Based Systems Development and Tacit Knowledge Diffusion

This subsection intends to integrate the above theoretical information. This research tries to propose the role of meta-abilities when developing learning-based systems. Meta-abilities in turn are developed by instilling the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse. It is argued that the development of meta-abilities can increase an individual's confidence and willingness to influence and share activities with other members. Through influencing and sharing activities, an individual can create ideas, actions, reactions and reflections (Nonaka and Takeuchi, 1995; Malhotra, 1997; Choudrie and Selamat, 2004). These ideas, actions, reactions and reflections in turn represent an individual's externalised and shared tacit knowledge (ibid).

By documenting the externalised and shared tacit knowledge, an individual can provide inputs to the system analyst for updating the system (Haldin-Herrgard, 2000). As discussed above, meta-abilities assist in the documentation process through the value of self-documentation (Butcher *et al.*, 1997; Choudrie and Selamat, 2005). The documented materials can be in the form of a report, a notebook or a just-in-case file. This tangible information can be used to re-examine and modify the content of the IS (Malhotra, 1997). Being continuously updated, it is argued that the systems can promote learning because staff members can gain new insights in performing tasks (ibid).

From the above discussion it can be learnt that an individual learns from the knowledge or expertise of others, using the means of IT-based IS. Based on the diffusion theory proposed by Rogers (1983), this research argues that the iterative process of externalisation and internalisation can be termed as the diffusion of tacit knowledge. This is due to the diffusion of innovation requiring individuals to externalise and share the innovation, disseminate it through technological means and other people requiring internalising of the innovation knowledge in their minds (Rogers, 1983). Therefore, the above process ultimately can diffuse knowledge and skills within the organisation.

To recapitulate, this section provides an overall overview of what will be investigated in the practical situations. As noted in Chapter 1, a pilot case and an in-depth case study are used to investigate whether the aforementioned theoretical framework is obtainable in a real life setting. To illustrate this process, a framework is firstly developed.

The definitions and descriptions of this research framework are offered in the following section.

2.6 Research Conceptual Framework

Reflecting on the above discussion, it can be determined that individual development becomes the starting point in the OL framework. Additionally, it can be learnt from the previous discussion that understanding organisational roles, internal strengths, formal and informal discussion and rational discourse should become the starting point for the individual development. In the meantime, the constructs of the existing OL frameworks that are discussed in section 2.4 are used as points of reference in developing the OL framework of this research. This is because the focus of this research is to improve the humanistic aspects of the existing OL frameworks and not to abandon them. This includes the accumulation methods of tacit knowledge where this research intends to introduce the concept of self-documentation. Based on this viewpoint, the OL framework of this research comprises of the following activities:

- Individual development

  This strategy is achieved by focusing on influencing skills, sharing attitudes, and, above all, meta-abilities. Meta-abilities in turn are fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse. Individuals examine the problem situation and determine the most appropriate solution using cognitive skills. These skills can also be used to understand and resolve problems. Self-knowledge enables individuals to use their knowledge flexibly, form better judgements for future actions and obtain a motivation that will allow them to obtain a range of behavioural options for themselves. An individual requires the emotional resilience to be able to cope with pressure and adversity. Lastly, a personal drive or ambition enables an individual to motivate oneself and others as well. All these internal processes will interact with the individual's expert knowledge in order to produce rational solutions to problems. An individual externalises the rational solutions to problems using two means, which are influencing skills and sharing attitudes. This is because it is argued that meta-abilities build positive characteristics when using tacit knowledge, such as a high level of confidence, willingness, resilience, good judgement and being motivated by strong feelings.

- Knowledge acquisition

  When undertaking "influencing" and "sharing" activities, an individual implicitly expresses his tacit knowledge. This expression is either in physical form (actions and reactions) or verbal form (ideas and reflection). Documenting the externalised and shared tacit knowledge enables useful and relevant inputs to be provided for organisational IS development. Knowledge documentation can be undertaken by the staff members themselves or a knowledge stewards such as a systems analysts, meeting secretaries or information officers. At this level of activity, the externalised tacit knowledge is documented and transformed into explicit knowledge (e.g. through business reports, written descriptions or instructions) for systems analysts' further action.

- Organisational memory

  The systems analysts study the documented inputs provided by staff members or knowledge stewards and codify them. By the time the inputs are transformed into codified domains within the database systems, they become information for assisting staff members in fulfilling their responsibility.

- Information distribution

  After the above process, externalised knowledge becomes information that can be accessed by all staff members. Staff members can obtain access to the organisational approaches in their daily activities and operations or when solving problems, by using information technology such as a local area network.

- Information interpretations

  By obtaining access to new organisational approaches and internalising them, staff members can improve their actions through better knowledge and consequently can undertake their tasks effectively – the learning process. Through the learning process, an individual's understanding of the organisation's activities (tacit knowledge) is enriched. This new understanding in turn becomes a platform for continuous IS re-examination and modification processes.

By obtaining new information, a staff member is able to identify a colleague's strengths. This scenario illustrates that one's knowledge is being diffused within the organisation. This is due to the diffusion of innovation requiring individuals to externalise and share the innovation, disseminate the innovation through technological means, and other people requiring internalisation of the innovation knowledge in their minds (Rogers,

1983). Therefore, it can be declared that the ultimate outcome of the above activities is tacit knowledge diffusion. The ways in which the above activities relate to each other are illustrated in Figure 2.1.

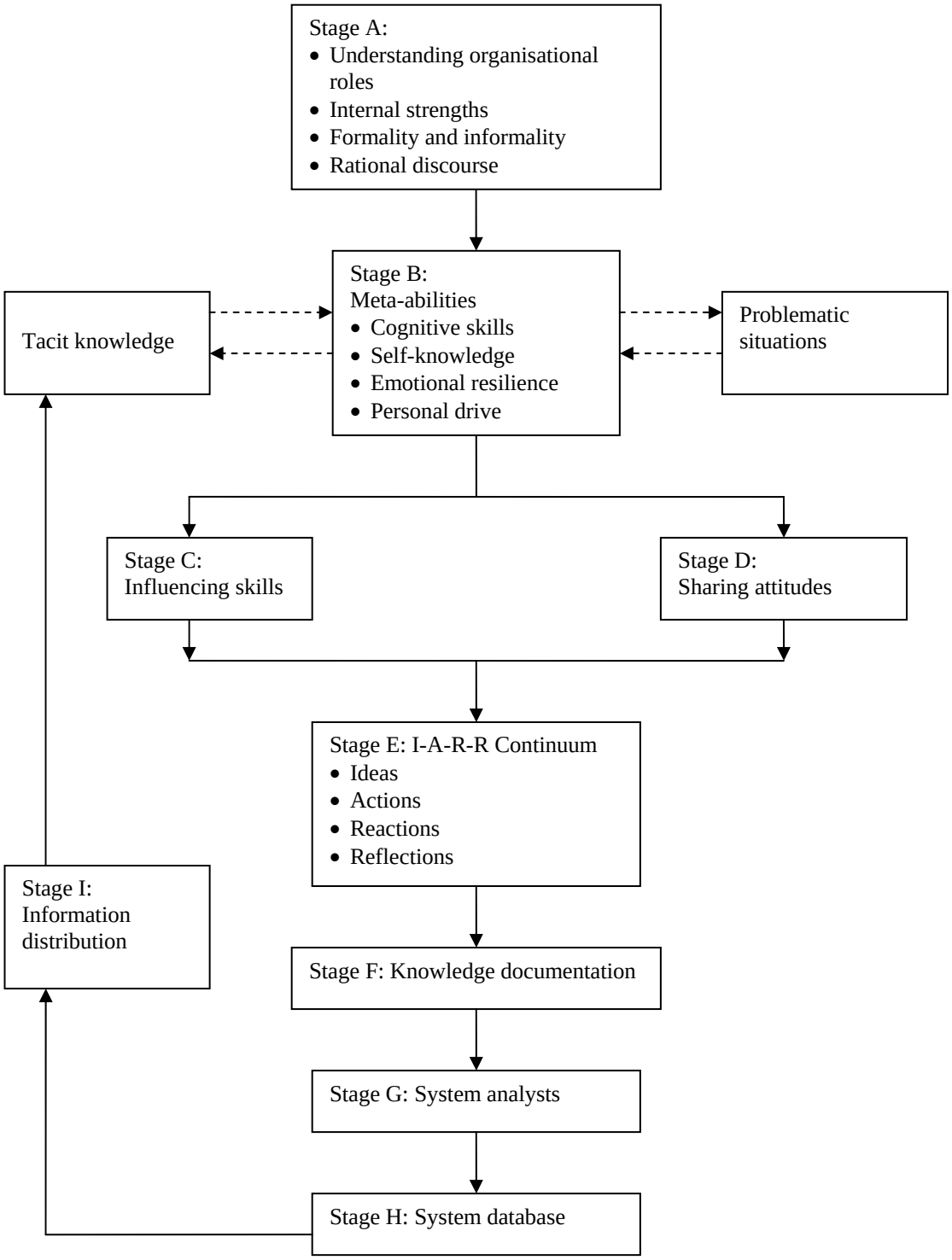

Figure 2.1 Theoretical framework for the learning-based systems development

As shown in the diagram, individual development is initially fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse (Stage A). As discussed in Section 2.5.2, the element of understanding organisational roles is proposed by Barham and Rassam (1989), Burgoyne (1988), Schroder (1989), Morgan (1989), Drucker (1992), Butcher *et al.* (1997) and Harvey and Butcher (1998). In short, it was found that understanding organisational roles increases the motivation to work diligently and thoroughly in the organisation amongst staff members (ibid). This, in turn, increases staff members' concern with the relevancy of the provided information in order to accomplish organisational tasks. Therefore, the element of understanding organisational roles is beneficial to be included in OL-based IS development.

Contrastingly, the element of internal strengths is proposed by Barham and Rassam (1989), Burgoyne (1988), Schroder (1989), Morgan (1989), Drucker (1992), Pedler *et al.* (1994), Goleman (1995), Fitz-Enz (1997), Butcher *et al.* (1997) and Manogran and Liang (1998). As noted above, the internal strengths that were proposed by this research consist of personal confidence, observing accepted organisational approaches, undertaking tasks with commitment and self-discipline, self-awareness, self-remembrance, compassion, sincerity and willingness to change. These eight internal strengths were selected because being equipped with those elements enables staff members to determine how and when knowledge will be practised within the organisation, which is critical to the learning process (Butcher *et al.*, 1997). This characteristic, in turn, increases the applicability of the proposed eight internal strengths in developing OL-based IS.

Another element that is proposed by this research when developing individuals is the ability to conduct formal and informal discussions within the organisation. This is because staff members face various tasks in daily activities – routine, non-routine, official and unofficial (Earl and Hopwood, 1980). When equipped with the ability to conduct formal and informal discussions, it is argued that staff members can read situations, understand and resolve problems, and consider a range of options in a collective manner (Butcher *et al.*, 1997). These values can highlight the need to continuously re-examine and modify the contents of the system (Malhotra, 1997). Therefore, the element of formal and informal discussions is beneficial to be included in OL-based IS development.

The final individual developmental element that is proposed by this research is rational discourse. Rational discourse was selected because whenever an IS is applied, it serves some human interests; therefore, the design choices are made to serve some interests at the expense of others and involve moral value judgements (Klein and Hirschheim, 1996). This means that practical advice concerning the design of a learning-based IS must not be limited only to technical aspects, but also address moral issues, such as what is good or bad, or right or wrong in any particular application. Therefore, there is a need to establish a platform to approach such value judgements in a rational way.

As the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse enable the use of knowledge and skills in an effective manner (Goleman, 1995; Butcher *et al.*, 1997; Malhotra, 2004), they are beneficial to be utilised in developing meta-abilities (Stage B). Butcher *et al.* (1997) defined meta-abilities as the underlying learned abilities that play an important role in enabling, and making effective, a wider range of managerial knowledge and skills. Four main meta-abilities were identified in the organisational development area as follows: (1) cognitive skills; (2) self-knowledge; (3) emotional resilience and (4) personal drive. Meta-abilities offer a substantial contribution by making individuals more astute and insightful, able to make better judgements and to envision more alternative actions (ibid). Being equipped with these competencies, staff members can face the difficulties in the externalisation and sharing of tacit knowledge and in obtaining information from colleagues, and can consequently become the enablers of tacit knowledge externalisation and sharing. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS (Nonaka and Takeuchi, 1995; Malhotra, 1997; Choudrie and Selamat, 2004).

Additionally, it can be learnt that meta-abilities can assist in building a confident and responsible individual (Butcher *et al.*, 1997; Harvey and Butcher, 1998). This can be learnt from these two competencies. First, meta-abilities can create individual influencing skills (Stage C) (ibid). Second, meta-abilities can develop individual sharing attitudes (Stage D) (ibid). As the problems of developing OL-based IS are founded on the need to develop an individual's ability to externalise and share of tacit knowledge, as discussed in the previous sections, the influencing skills and sharing attitudes are the humanistic elements that can be considered. In other words, being equipped with these competencies,

staff members can face the difficulties in the externalisation and sharing of tacit knowledge and in obtaining information from colleagues, and can consequently provide externalised tacit knowledge for OL-based IS development.

When undertaking "influencing" and "sharing" activities, an individual implicitly expresses his tacit knowledge (Stage E). During this stage, knowledge and meta-abilities strongly influence the way in which an individual interprets, analyses and makes judgements about a given situation. Equivocally, the range of behavioural strategies that the individual will consider is influenced, and so are the actions that he or she ultimately decides to utilise and the ideas he or she ultimately shares. The level and range of influencing skills and sharing attitudes an individual can call upon will determine how well or in what way these ideas, actions, reactions and reflections are taken. It is these individual ideas (I), actions (A), reactions (R) and reflections (R) which ultimately provide externalised tacit knowledge for OL-based IS development. This research term the relationship between these four elements as I-A-R-R continuum (Selamat and Choudrie, 2004; Choudrie and Selamat, 2004). In other words, I-A-R-R continuum is the original contribution of this research and it represents staff members' externalised and shared tacit knowledge. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS (ibid).

To ensure that the externalised and shared tacit knowledge (in I-A-R-R form) can become tangible and measurable inputs for a continuous development of IS, it must be documented first (Huber, 1991; Karhu, 2002). This process is undertaken at Stage F. At this stage, the externalised tacit knowledge is documented and transformed into explicit knowledge (e.g. through business reports, written descriptions or instructions). Knowledge documentation can be achieved by the value of self-documentation, which is also developed by meta-abilities (Butcher *et al.*, 1997; Choudrie and Selamat, 2005). This is because, due to the development of meta-abilities, the willingness to question implicit assumptions, explore new possibilities and direct energies toward higher standards enables the staff members to be well prepared, using good documented progress reports or working papers (ibid). All these self-documented facts in turn provide inputs for IS continuous update. The updated contents property enables the system to disseminate relevant information and ultimately establish a learning process.

The responsibility to update the system is on the hand of systems analysts (Huber, 1991; Saint-Onge, 1996; Haldin-Herrgard, 2000; Laudon and Laudon, 2003). At this stage, the systems analysts study the documented inputs provided by staff members and codify them (Stage G). By the time the inputs are transformed into codified domains within the database systems, they become information for assisting staff members in fulfilling their responsibility (Saint-Onge, 1996; Laudon and Laudon, 2003). In the diagram, this process is represented by Stage H.

The information in the system can be disseminated within an organisation by using information technology such as a local area network (Stage I) (Laudon and Laudon, 2003). By obtaining new information, a staff member is able to identify a colleague's strengths, to access to new organisational approaches, and ultimately internalising them. At this stage, staff members can improve their actions through better knowledge and consequently can undertake their tasks effectively – the learning process. Through the learning process, an individual's understanding of the organisation's activities is enriched (tacit knowledge development). This new understanding in turn becomes a platform for continuous IS re-examination and modification processes.

To recapitulate, this research developed a conceptual framework based on the concepts of tacit knowledge externalisation and meta-abilities. This framework provides the basis of a new perspective on promoting learning within the organisation. The processes undertaken in the framework will ensure that the contents of organisational IS are subject to continual re-examination and modification given the changing environment. Continuously challenging the current "company norm," such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow (Malhotra, 2004). By internalising a system's operations individuals can improve actions through better knowledge and understanding (Meso and Smith, 2000).

2.7 Research Propositions

As mentioned in Chapter 1, initially there was no hypothesis to form and test in this research. However, from the theoretical review, seven propositions were formed. These propositions are eventually validated and verified in this research using the hermeneutic mode of analysis.

2.7.1 Meta-Abilities Development

As mentioned above, this research proposes four elements employed to develop the meta-abilities which are: (1) understanding organisational roles; (2) internal strengths; (3) formal and informal discussion and (4) rational discourse. These elements are considered to be able to foster the development of meta-abilities. In other words, the increment in the level of understanding organisational roles, internal strengths, formality and informality and rational discourse will increase an individual's meta-abilities. Based on this argument, the relationship between understanding organisational roles, internal strengths, formality and informality, rational discourse and meta-abilities could be established in practical situations.

2.7.2 Influencing Skills

Butcher *et al.* (1997) suggest that meta-abilities should have a significant impact on the staff members' level of influencing skills. One obvious reason offered in the literature (Butcher *et al.*, 1997) is that meta-abilities develop communication skills, assertiveness, the ability to deal with conflict, the ability to persuade others, the ability to manage organisational politics and a desire to develop others. Together, all these internal values enable individuals to have more confidence and a greater sense of responsibility to influence people around them. Therefore, the increment in the level of meta-abilities will increase an individual's influencing skills. Based on these previous findings, the relationship between influencing skills and meta-abilities could be obtained in practical situations.

2.7.3 Sharing Attitudes

Butcher *et al.* (1997) also suggest that meta-abilities should have a significant impact on the staff members' level of sharing attitudes. This is because meta-abilities enable staff members to have a desire to motivate others and meet targets (Butcher *et al.*, 1997). This is to ensure that everyone in the same department or unit understands the targets and strives for success. In other words, by equipping individuals with meta-abilities, they will be more motivated to share their knowledge and skills within the organisation. Based on this previous finding, the relationship between sharing attitudes and meta-abilities could be obtained in practical situations.

2.7.4 Ideas

It is argued that influencing skills and sharing attitudes should have a significant impact on staff members' capability to express their ideas in a creative and spontaneous manner (Butcher *et al*., 1997; Smith, 2001). This phenomenon is fostered by the meta-abilities of cognitive skills. As mentioned above, cognitive skills are fostered by the elements of task priority, personal targets, observing accepted organisational approaches, willingness to change, formality and informality, and rational discourse (Earl and Hopwood, 1980; Barham and Rassam, 1989; Burgoyne, 1988; Schroder, 1989; Morgan, 1989; Drucker, 1992; Klein and Hirschheim, 1996). All these elements enable individuals to express their ideas in a creative and spontaneous manner because they allow staff members to "read situations, understand and resolve problems" effectively. Based on these previous findings, the relationship between influencing skills and sharing attitudes and the externalisation of ideas could be obtained in practical situations.

2.7.5 Actions and Reactions

It is also argued that influencing skills and sharing attitudes should have a significant impact on staff members' capability to act and react in a creative and spontaneous manner (Butcher *et al*., 1997; Smith, 2001). This phenomenon is fostered by the meta-abilities of self-knowledge and personal drive. Being equipped with these meta-abilities, individuals are able to act and react in a creative and spontaneous manner (ibid). This is because they allow staff members to consider a range of options in their own behaviour and to make better judgements of what to do. They allow other skills and knowledge to be used more flexibly. Based on these previous findings, the relationship between influencing skills and sharing attitudes and the creation of actions and reactions could be obtained in practical situations.

2.7.6 Reflections

It is also argued that influencing skills and sharing attitudes enable staff members to externalise a good reflection when dealing with external pressure, conflicts or tensions (Butcher *et al.*, 1997). This value is fostered by the meta-abilities of emotional resilience. This is because the emotional resilience develops an individual's strength to wisely deal with organisational conflicts (ibid). Following this rationale, this research expects that

influencing skills and sharing attitudes should be closely related to the amount of reflection.

2.7.7 Documented I-A-R-R

From the above discussion it can be seen that meta-abilities create influencing skills and sharing attitudes which enable individuals to generate the continuum of I-A-R-R (Nonaka and Takeuchi, 1995; Malhotra, 1997; Choudrie and Selamat, 2004). This continuum contains tacit knowledge that has been externalised and shared by individuals (ibid). Documenting the externalised and shared tacit knowledge should provide useful and relevant inputs for IS development (Haldin-Herrgard, 2000). Following this rationale, the present study expects that the documentation of I-A-R-R continuum will be closely related to the establishment of a continuous IS re-examination and modification. Continuously challenging the current "company way," such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow. Therefore this type of system is suitable for the LO.

The aforementioned research propositions will be utilised to answer the research questions, which are: "How do we include individuals in the learning-based systems development? Why use meta-abilities in order to include individuals in the learning-based systems development?" By verifying the above propositions it is expected that this research will postulate that individual development should become the starting point of the OL framework.

2.8 Summary

This chapter has described the role of meta-abilities in the externalisation and sharing of tacit knowledge for the learning-based systems development. Three main reasons for the need to adopt meta-abilities in the field of tacit knowledge externalisation and sharing are recognised as: (1) the fact that tacit knowledge resides in an individual's mind; (2) the existence of factors which keep individuals from using the knowledge and skills they have; (3) the rapid changes that are occurring in the business environment and organisational life. Due to tacit knowledge residing in an individual's mind and its transparent and subjective characteristics, there is a need to develop an individual's commitment and capabilities to externalise and share them. There are also factors that prevent individuals from using the knowledge and skills they have. Therefore, there is a

need to increase self-knowledge, disregarding past habits and improving abilities, which underpin and determine how and when knowledge and skills will be used. Rapid changes in the business environment and organisational life do occur, and there is a need to respond intelligently to unknown situations and go beyond the established knowledge to create unique interpretations and outcomes. All these highlight the need to understand the externalisation and sharing of tacit knowledge based on the situational context and orientation. The mechanistic and structural forms of externalising and sharing tacit knowledge are inadequate to understand the intangible factors. Therefore, the adoption of meta-abilities in the externalisation and sharing of tacit knowledge is proposed.

Meta-abilities are fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse. It is argued that the development of meta-abilities develop an individual's influencing skills and sharing attitudes. Influencing skills and sharing attitudes in turn enable individuals to externalise their tacit knowledge in the form of creative ideas, actions, reactions and reflections. Staff members will document the externalised tacit knowledge and transform them into explicit knowledge (e.g. business reports, written descriptions and instructions). Systems analysts will study the documented inputs provided by the staff members and codify them.

The theoretical processes as discussed above can ensure that the contents of IS are subject to continual re-examination and modification, given the changing environment. Continuously challenging the current "company norm," such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow. By internalising a system's operations, individuals can improve actions through better knowledge and understanding.

This chapter has provided details of the theoretical aspects of this research. The next chapter details how an appropriate research methodology was identified and developed to collect the data necessary for this research.

3 CHAPTER THREE: Research Approach

3.1 Introduction

As outlined in the preceding chapter, this research is designed to explore the impact of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in developing meta-abilities, influencing skills and sharing attitudes. This development will then be linked to the externalisation and sharing of tacit knowledge and learning-based systems development. Also noted is that a conceptual framework has been developed to study that relationship. In order to assess its validity and reliability, this chapter describes and discusses the research approach applied to this research.

There are various ways of describing and defining a research approach. The organisation of the description and definitions of this research approach follows the same structure as that of Denzin and Lincoln (1994) and Myers and Avison (2002). This structure provides a systematic way of describing and defining the research approach. The structure is as follows: (1) Part I provides a general overview of the adoption of qualitative research approach in this research; (2) Part II includes sections which discuss the research approaches of this research; (3) Part III discusses the use of qualitative techniques for data

collection of this research and (4) Part IV discusses modes of analysing and interpreting the data of this research.

3.2 Part I: Overview of Qualitative Research

In the IS area there are two research approaches that are commonly used: quantitative and qualitative (Myers and Avison, 2002). Due to the nature of this research, which is humanistic and subjective, this research utilises the qualitative research approach.

As noted in the first chapter, the aim of this research is to have a deep understanding of the impact of six competency sets on the externalisation and sharing of tacit knowledge. This impact can be studied effectively by employing research approaches that can grasp the idea of individual context, experience and intuitions. Therefore, qualitative research that is dedicated to the study of social and cultural phenomena is appropriate for this research.

The motivation for undertaking qualitative research is that if there is one thing which distinguishes humans from the rest of the natural world, it is their ability to talk (Myers and Avison, 2002). As this research studies the internal development of humans, rich information on it can be obtained by asking them to articulate their internal feelings. Therefore, qualitative research is beneficial in this research.

Qualitative research approaches are designed to help researchers understand people and the social and cultural contexts within which they live (Myers and Avison, 2002). In other words, qualitative researchers seek answers to questions that stress how social experience is created and given meaning (ibid). This criterion is applicable to this research as it studies the manner in which meta-abilities give impact to an individual's social activities (tacit knowledge externalisation and OL). Understanding how people make sense of their lives and how people come to understand and manage day-to-day situations is regarded as important in this research, and is something that qualitative research emphasises (Miles and Huberman, 1994). Therefore, an understanding of how people externalise and share tacit knowledge from their minds using meta-abilities "is largely lost when textual data are quantified" (Kaplan and Maxwell, 1994).

A qualitative approach is also suitable for this research because it emphasises the intimate relationship between researchers and those they study (Miles and Huberman,

1994). In addition, there are three reasons for qualitative research approaches being suitable for this research. First, there is the recognised difficulty in attempting to "objectively" measure an adult development process (Butcher *et al.*, 1997). This research argues that while a pre-post test measurement approach can be valuable in the evaluation of training, i.e. the acquisition of specific knowledge and skills, it is not applicable to the personal transition described as underpinning the development process. This is because the process is a uniquely individual one and can involve change in varying combinations of underlying personal factors.

Second, part of the development process is characterised by changes in individual perception, reasoning and judgement (Butcher *et al.*, 1997). These changes in turn become a means of studying the implications of meta-abilities for tacit knowledge externalisation and sharing. The best way to understand these changes is through the individuals describing how they view, analyse and make decisions about situations (ibid). Qualitative approach places an emphasis on processes, and meanings that are not rigorously examined or measured, in terms of quantity, amount, intensity or frequency is appropriate to embrace those humanistic processes.

In studying the impact of meta-abilities on the externalisation and sharing of tacit knowledge, qualitative research is beneficial as it allows participants to raise topics and issues which the evaluator may not have anticipated beforehand and that might be critical to the investigation (Marshall and Rossman, 1999). It also allows participants to express their feelings and offer their perspectives in their own words (ibid). Often participants will provide examples or anecdotes that illustrate a particular point of view. These anecdotes can be very powerful and persuasive when evaluators are reporting findings. In this case, the strength of qualitative research is that it is best for exploratory and descriptive analyses, which stress the importance of context, setting, and subjects' frames of reference (ibid).

Patton (1990) also found similar benefits of qualitative research and listed them as: (1) it allows the researcher to understand the subject of study in more depth and detail than may be achieved using a standardised questionnaire; (2) it provides openness, as new theories can be generated and phenomena ignored by most or all previous researchers and literature is recognised; (3) it helps the researcher to consider the world view of his/her study and its categories, rather than imposing categories and simulates experiences of the

world; (4) it attempts to avoid pre-judgements – the goal is to try to capture what is happening without being judgemental.

However Patton (1990) also warns of the disadvantages associated with this type of research and lists them as: (1) fewer people are studied and as a result it is less easily generalised; (2) it is difficult to aggregate data and make systematic comparisons; (3) it is dependent upon a researcher's personal attributes and skills (which leads to personal bias); (4) participation in a setting can always change the social situation (although non-participation can always change the social situation as well). Another criticism of qualitative approach is regarding the value of its dependence on small samples, which is believed to render it incapable of generalising conclusions (Hamel *et al.*, 1993; Yin, 1984, 1993, 1994). As this research is qualitative in nature, the stated issues are also associated to this research. However, as the benefits of the qualitative research superseded the disadvantages, qualitative research was still utilised. The reasons are explained in detail below.

The issue regarding fewer respondents was overcome by utilising a population rather than a sample. In this research, the population was the users of the Centralised Maintenance Management Systems (CMMS) (the descriptions are shown in Chapter 5). This in turn overcame the issue of generalisation. The issues of data aggregation, systematic comparisons and generalisation were overcome by demonstrating that the study is conducted within a structured approach, which is guided by theoretical concepts and models and the use of a number of data gathering methods and processes (Cohen and Manion, 1994; Bell, 1996).

Another important issue is personal bias due to the dependence upon the researcher's personal attributes and skills. The issue of personal bias was dealt with by using two strategies. First, the triangulation of methods and data sources was employed in this research. Second, the idea of keeping two voices separate - emic (insiders'/participants' voice) and etic (outsider's/researcher's voice) – was applied as much as possible in the data, and the emic voice was used as the predominant voice in the text. Furthermore, as argued by Krieger (1991), people cannot avoid a bias because the outer world or peoples' "external reality" is inseparable from what people already know based on their lives and experiences – peoples' "inner reality".

Finally, the issue that participation in a setting can always change the social situation is overcome by developing a systematic research schedule. In this case, the respondents were allocated a certain period of time to adapt the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in the workplace without any interruption from the researcher.

Based on the aforementioned discussions, qualitative research is considered to be appropriate for this research. This is because it can assist in capturing the essence of the impact of meta-abilities on the externalisation and sharing of tacit knowledge. Whilst this subsection discusses the descriptions and definitions of qualitative research, the next subsection will offer descriptions and definitions of the research methods of this study.

3.3 Part II: Research Methods

A research method is a strategy of inquiry which includes research design and data collection (Myers and Avison, 2002). The choice of research method influences the way a researcher collects data (ibid). Specific research methods also imply different skills, assumptions and research practices. The research method that was employed in this research was a case study. This case study was longitudinal in nature. The definition and description of these two methods are dealt with in the following two subsections.

3.3.1 The Case Study Method

There are several research methodologies in the IS area including action research, ethnography, grounded theory and case study research (Myers and Avison, 2002). The case study method is the one that is adopted in this research. The reason for utilising the case study method is now offered.

Yin (1994) defines the scope of a case study as follows: “A case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” Clearly, the case study research method is particularly well-suited to this research since the object of this discipline is the study of IS in organisations and “interest has shifted to organisational rather than technical issues” (Benbasat *et al.*, 2002).

Additionally, the case study method is applicable to this research due to the nature of the subject of study in this research, which is subjective in nature. It is hard to measure

internal elements such as confidence, self-awareness, self-remembrance, compassion, cognitive skills, self-knowledge, emotional resilience and personal drive. To understand these elements, the researcher needed to immerse himself in the participants' activities and build a good relationship with the participants. By having a good relationship, trust could then be established (Karhu, 2002) and consequently the participants were encouraged to become actively involved in this research. To capture all these complexities, the case study method is the most suitable one for this research.

Another reason associated with applying the case study method to this research is a need to understand "how" and "why" questions. Yin (1994) argues that the emphasis on the "how" and "why" questions demarcates case study research from other approaches such as ethnography, action research and grounded theory. As mentioned in chapters 1 and 2, this research aims to explore the following questions: "How do we include individuals in the learning-based systems development? How do we establish an effective learning environment in an organisation? How meta-abilities assist in enabling learning-based systems development? Why are individuals important in the process of establishing a learning environment within the organisation? Why use meta-abilities in order to include individuals in the learning-based systems development?" These questions illustrate that the emphasis of this research is on "how" and "why" questions. Therefore, as suggested by Yin (1994), the case study approach needs to be adopted in this research.

The binding feature of the ethnography (e.g. Agar, 1980; Hammersley and Atkinson, 1983; Lewis, 1985; Van Maanen, 1988; Fetterman, 1998) and action research (e.g. Rapoport, 1970; Jönsson, 1991; Stowell *et al.*, 1997) methodologies is the emphasis on comprehensive in-depth descriptions. Such descriptions are aimed at either the cultural behaviour of a group, at capturing the essence of an experience or at understanding the complexity of a bounded case. However, both methodologies do not really emphasise "how" and "why" questions, which are central to this research. Contrastingly, the binding feature of grounded theory is the emphasis on the building of a theory that is ground in systematically gathered and analysed data to conceptualise one process inherent within a certain contextual environment (Martin and Turner, 1986). However, the objective of this research is not to build a theory based on empirical observations or data. Rather this research seeks to develop theory that is based on the understanding of "how" and "why" questions. It is the emphasis on the "how" and "why" questions that demarcates case study

research from other approaches such as ethnography, action research and grounded theory (Yin, 1994). As this research emphasises the "how" and "why" questions, as stated above, the case study method is appropriate to this research.

An additional reason for using the case study method is that it is the most widely used research method or strategy in the IS area (Walsham, 1995; Cavaye, 1996; Myers, 1997, Orlikowski and Baroudi, 2002). Overall, these researchers agree that the case study research is appropriate where the predominant research questions are those of "how" and "why," which is the case with this research. In this instance, case study research allows the incorporation of a range of materials which may suggest different stories and collect data right away without already having determined the answer or even the form of the answer.

In-Depth and Pilot Case Studies

Having discussed the reasons for adopting the case study method, this research now describes the version of the case study method that is adopted in this research. The term "case study" has multiple meanings. It can be used to describe a unit of analysis or to describe a research method (Myers and Avison, 2002). Nevertheless, as argued by Patton (1990), both share a similar understanding of case study research, which is "to understand a subject of interest in great depth and in context." Miles and Huberman (1994) describe a case as "a phenomenon of some sort occurring in a bounded context." Further, they maintain that a case is the researcher's unit of analysis. For this research, the case referred to is the impact of meta-abilities on the externalisation and sharing of tacit knowledge amongst employees within an organisation.

Two versions of case study research are now established in the literature, an in-depth case study and multiple case studies (Yin, 1994). According to Rowley (2002), researchers are now obliged to specify the case study research version they are employing. An in-depth case study version represents the original version of case study research, with an emphasis on the phenomenon of some sort occurring in a bounded context (Yin, 1994; Miles and Huberman, 1994). The objective is to understand a subject of interest in great depth and in a context (Patton, 1990). There is a problem of generalisation, validity and reliability in in-depth case studies, and as such, multiple case studies have been proposed (Rowley, 2002). According to Rowley (2002), the multiple case study version is aimed at validating the phenomenon that is being investigated through different entities.

For this research, an in-depth case study and a pilot have been applied. An in-depth case study of this research was undertaken at Perwaja Steel Pte Ltd (Perwaja), a steel manufacturer in Malaysia. Three reasons can be advanced for the adoption of an in-depth case study in this research. First, this version is well suited to the study of meta-abilities and the externalisation of tacit knowledge due to its ability to produce a multifaceted account of individual tacit knowledge externalisation in a context (Smith, 2001). In Chapter 2, it has been noted and analysed that the externalisation and sharing of tacit knowledge is a complex phenomenon because it is transparent and subjective in nature; hence, it requires a suitable approach to capture this complexity. Second, an in-depth case study enables the development process of meta-abilities amongst the research participants to become more focused (Butcher *et al.*, 1997). Consequently, an effective result will be delivered. As a result, it is more likely to be intelligible to, and useable by, those in the observed situations. Third, this research can be treated as a preliminary or pilot study because there is no research that has been done on the topic of the role of meta-abilities in the externalisation of tacit knowledge and its implications on the OL-based IS area. The definitions and descriptions of the case study in Perwaja are provided in Chapter 5.

The other method employed in this research is that of a pilot. A pilot could also be referred to as a feasibility study, which is a "small scale version or trial run, done in preparation for the major study" (Polit *et al.*, 2001). The pilot study of this research was undertaken at Universiti Utara Malaysia, one of the higher education institutions in Malaysia. The general aim of undertaking a pilot was to examine the feasibility of the conceptual framework obtained from chapters 1 and 2 in a real life setting. Apart from this, a pilot was also undertaken for two additional reasons. The first was to test whether the content of the developed training module would be able to develop the six competency sets of the pilot research participants. The second reason was to determine an appropriate research technique that is specific to this research, particularly when collecting the data. The definitions and descriptions of a pilot case are provided in Chapter 4.

To recapitulate, in-depth and pilot case studies were employed in this research. This strategy was adopted to understand a subject of interest in greater depth and within a context.

Conducting the Case Studies

As noted above, a pilot and an in-depth case study were conducted. At the start of this research, the organisations used for this research were contacted. The main reason for doing this was to enable the organisations to thoroughly evaluate the researcher's letter of introduction, research plan and research summary. This was to ensure that the organisations used for this research gave their full consent to a longitudinal study and consequently provided full cooperation for this research. After the correspondence material was sent, the researcher undertook a follow-up process using electronic mail (e-mail) and telephone conversations. The advantage of the follow-up process was that the researcher started developing a good rapport with the organisations from the initial stage of the research. Ultimately, the organisations consented to participating in this research by sending an approval letter to the researcher.

The research activity consisted of three stages: (1) understanding the organisation's operational background; (2) the implementation of the training programme and (3) data collection for the research analysis. The breakdown of the activities for each stage can be obtained from Appendix A.

There were four reasons for understanding the operational background of organisations used for this research. The first was to study the nature of the business and the architecture of the IS that were used to facilitate their daily operation. The second reason was to study how the IS was integrated in their learning processes; thereby, assisting in determining the human problems which caused ineffectiveness and inefficiency in that process. Third, it was necessary to determine the system that will be investigated by this research. The final reason was to assist the researcher in enriching the training module by transforming the themes of the existing human problems into cases. The cases in turn were discussed in the training programme.

After completing the process of understanding an organisation's operational background, the process of preparing a training module, presentation slides and programme outline were commenced. The summary of the training module is attached in Appendix E. The preparation was undertaken by referring to the inputs from the literature review and practical experience. Thereafter, the training programme was undertaken at the premises determined by the involved organisations.

In the pilot case, the participants consisted of 11 lecturers and a resource centre officer. The lecturers were selected as they possessed the skills to evaluate the theoretically based course due to their vast academic experience. This in turn enabled the researcher to obtain input to evaluate the relevancy of the training module in developing the research participants' meta-abilities, influencing skills and sharing attitudes. The resource centre officer, on the other hand, was selected because he provided a platform to evaluate the impact of those humanistic elements in IS development. The length of the programme was six days due to the faculty's policy on internal training.

Contrastingly, for Perwaja, 31 engineers (24 from the Kemaman plant and 7 from the Gurun plant) participated in this research. Additionally, 8 system officers were also selected. The engineers were selected as they were the critical group in the plant; therefore the learning process was emphasised on them. Alternatively, the system officers were selected because they provided a platform to evaluate the impact of the framework in IS development. The training programme was held at Gurun from April 18th to 23rd, 2004 and Kemaman from April 25th to 30th, 2004. The number of training days was limited to six days due to the policy of the company on industrial training.

On the final day of the training programme, the research participants constructed a comprehensive 60 days action plan covering personal development and organisational change issues. This formed the basis of the progress review. For the progress review, the researcher met the research participants individually in order to further develop the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse by discussing their achievements on the targeted actions. This session normally took more than one hour. This was due to the need to discuss the level of development in-depth. Any problems that arose during the developmental period were discussed and tackled in a face-to-face meeting. This meeting was held at the research site in one of the meeting rooms.

The data collection commenced one month after the progress review session. A one-month period was given to the participants to enable them to apply the six competency sets in their daily tasks. The aim of this stage was: (1) to gather the data on the impact of the training programme on developing the research participants' six competency sets; (2) to study whether the six competency sets enabled the research participants to externalise their tacit knowledge in the form of ideas, actions, reactions and reflection, and (3) to

determine whether documenting the externalised tacit knowledge enabled continuous IS re-examination and modification. The data collection methods that were employed at this stage were interviews, observations and document review. The descriptions and definitions of each of the data collection method are offered in the following section.

The Strengths and Weaknesses of the Case Study Method

Having discussed "why" and "how" case studies were undertaken, this research proceeds to determine the strengths and weaknesses of the case study method. Due to the various benefits that accompany case study research, as noted above, it is widely used in the IS area. Alternatively, there are negative implications, which detract from using the case study method.

It was found that most case study supporters emphasise the fact that case studies produce much more detailed information than is available through a statistical analysis. Supporters will also maintain that, while statistical methods might be able to deal with situations where behaviour is homogeneous and routine, case studies are needed to deal with creativity, innovation and context. Detractors argue that case studies are difficult to generalise because of inherent subjectivity and because they are based on qualitative subjective data, that can only be generalised in a particular context.

Bearing the strengths and weaknesses of case study analysis in mind, it was then employed in this research. This is because, based on the above discussions, the emphasis on "how" and "why" questions that is associated with this research requires the adoption of the case study method.

In order to further inform the research approach that is adopted in this research, the researcher used a longitudinal approach. A brief definition and description of this approach is provided in the following subsection.

3.3.2 Longitudinal Study

Implicit in the discussion of meta-abilities and tacit knowledge externalisation is the need to study two humanistic impacts at predetermined time points (Butcher *et al.*, 1997). The first is the research participants' ability to make explicit their tacit knowledge. The second is the research participants' understanding of meta-abilities. To undertake research within these two constraints, a longitudinal study is considered appropriate. The

definition and descriptions of a longitudinal study will be dealt with in the following paragraphs.

Longitudinal is a broad term. It can be defined as research in which "data are collected for each item or variable for two or more distinct periods; the analysed subjects or cases are the same, or at least comparable, from one period to the next, and the analysis involves some comparison of data between or amongst periods" (Menard, 1991). There are a number of different designs for the construction of longitudinal evidence: repeated cross-sectional study; prospective study, such as household panel surveys or cohort panels, and retrospective study, such as oral histories and life and work histories (ibid).

Repeated cross-sectional observations are the form of data most commonly used for assessing the determinants of behaviour in the social sciences (Coleman, 1981; Davies, 1994; Blossfeld and Rohwer, 1995). Generally, cross-sectional data is recorded in a succession of surveys at two or more points in time, with a new sample on each occasion (ibid). These samples either contain entirely different sets of cases for each period, or the overlap is so small that it is considered to be negligible (ibid). From this research point of view, the principal limitations of the repeated cross-sectional design render it inappropriate for studying developmental patterns within the cohorts of this research, as does its inability to resolve issues of causal order, which is another objective that is undertaken in this research. Additionally, since the cross-sectional survey is conducted at just one point in time, it is not suited for the study of social change which is the essence of this research. Further, in the subsequent chapters it can be seen that research was not only conducted at one point in time.

A retrospective study is an event-oriented observation design. Using this design, data is recorded and collected in continuous time retrospectively, using life history studies that cover the whole life course of individuals. The main advantage of this approach lies in the greater detail and precision of information (Blossfeld and Rohwer, 1995). However, as argued by Hakim (1987), a retrospective study does not offer the same strengths for research on causal processes. As a result, a retrospective study is not appropriate for this research. This is because studying causal processes is the essence of this research.

Having considered all the other longitudinal designs, this research proceeds to justify the adoption of a prospective design. A prospective design relates to the process of

interviewing individuals at predetermined time points. It is appropriate in this research due to the need to measure social change over a long span of time, and because research participants may differ from one another.

Under a prospective design, the temporal data most often available to social researchers are panel data, in which the same individuals are repeatedly interviewed across time (Buck *et al.*, 1994). Since the essence of this research is studying social change and dynamic behaviour created by meta-abilities in depth, a representative panel is appropriate because a representative panel involves repeated data collections at fixed intervals (ibid). Therefore, in this research interview, sessions with all the research participants are handled at fixed intervals. A cohort panel is not adopted in this research due to its long-term nature of study (Hagenaars, 1990). Contrastingly, a linked panel is not adopted in this research due to its tendency to have a multiple group of respondents (Buck *et al.*, 1994), which is not suitable to study the impact of meta-abilities on tacit knowledge externalisation.

Finally, due to the complexity of longitudinal data sets, user documentation is crucial for the researcher (Menard, 1991). It should contain essential information required for the analysis of the data and information to assist users in linking and aggregating data across waves. The documentation should make the analysis easier and more straightforward, and should help evaluate data quality.

To recapitulate, the use of longitudinal data can ensure a more complete approach to empirical research. Longitudinal data are collected in a time sequence that clarifies the direction as well as the magnitude of change among variables. This is the characteristic that is needed by this research. Therefore, this research is longitudinal in nature where the case study took approximately 15 months to be completed.

3.4 Part III: Data Collection Techniques

Each of the research methods discussed above uses one or more techniques for collecting empirical data. Myers and Avison (2002) found that many qualitative researchers prefer the term “empirical materials” to the word “data” since most qualitative data is non-numeric. In other words, data in qualitative research comes in the form of “words”, “phrases”, “sentences” and “narrations” which can provide a more complete portrayal of this subject under study than “numbers.” Blumer (1978) describes “words” and similar data as being capable of providing the “rich”, “full” and “real” story, rather

than the thin abstraction produced by "numbers." Indeed, these are the data considered appropriate in explaining human and social aspects which cannot be quantified in a universal manner (Ryan *et al.*, 1992). According to Miles and Huberman (1994), the strength of qualitative data is that it is rich and holistic with strong potential for revealing complexity nested in a real context.

The first stage of this research involved the researcher sitting in one "induction period." The aims of this induction period were to become familiar with the company and obtain an overall picture of its operation, products and services, departments and others. Besides that, the data will be used as a basis for the setting of the training programme. The description of this programme will be given in chapters 4 and 5. After the training programme, the process of collecting the data commenced. The means of collecting qualitative data within this research consists of interviews, observations and document review. The next subsections describe the reasoning for using these methods.

3.4.1 Interviews

Interviews are considered to be the favoured tool of the qualitative researcher for data collection (Denzin and Lincoln, 1994) and one of the frequently used data collection tools utilised for this research. Implicit in the implementation of the training programme, as noted above, is the existence of a limit in the numbers of participants. Therefore in-depth interviewing was undertaken in this research.

In-depth interviewing was conducted with the research participants in order to add detail and richness to the understanding of the post-training experience. This is valuable in gaining information, particularly about the outcomes of the six competency sets in externalising and sharing of tacit knowledge.

In-depth interviewing entails asking questions, listening to and recording the answers, and then posing additional questions to clarify or expand on a particular issue (Gubrium and Holstein, 2002). This research adopted three basic approaches to in-depth interviewing, which are as follows: the informal conversational interview, the semi-structured interview and the open-ended interview (ibid).

To understand an organisation's operational background, senior management were interviewed. For the pilot case study, the Dean of the faculty in a Malaysian higher

education institution was interviewed. For Perwaja, the interviewees were as illustrated in Appendix C. Senior management were considered to be the most suitable people to be interviewed because they were more familiar with the company's operations. During this stage, a semi-structured interview was employed. This was because this approach allows a great deal of flexibility in asking a pre-determined set of questions or issues that were related to the organisation's operations (Gubrium and Holstein, 2002). In this process the researcher was free to pursue certain in-depth questions. For example, the managers were asked about the functions of their departments in Perwaja and their managerial style in coordinating departmental activities. Due to Perwaja's operations being highly technical in nature, many expressed terms that were difficult to understand, such as "direct reduced iron", "electric arc furnace", "tapping", "ladle furnace" and others. Therefore, the researcher sought additional explanations from the respondents. This strategy was considered appropriate because understanding the operational background of an organisation from its senior management's viewpoint needs a more systematic and comprehensive approach by delimiting the issues to be taken up in the interview (ibid).

From this research point of view, the advantage of the semi-structured interview is that it makes interviewing a number of different persons more systematic and comprehensive by delimiting the issues to be taken up in the interview (Gubrium and Holstein, 2002). The weakness of this approach is that it does not permit the interviewer to pursue topics or issues of interest that were not anticipated when the interview guide was elaborated (ibid). Also, the interviewer's flexibility in wording and sequencing questions may result in substantially different responses from different persons, thus reducing comparability.

An informal conversational interview was utilised during the implementation of the training programme. This is to cope with the activities of the training programme, which required a spontaneous generation of questions in the natural flow of an interaction. For example, the researcher asked the research participants about the effectiveness of the lectures and their level of understanding of the six competency sets. When the participants felt unhappy with the researcher's teaching style, ideas on how to improve the discussion in the lecture room were sought. For example, one of the participants required indoor activities during the lecture. This requirement was fulfilled by setting indoor activities that related to the topic of discussion such as debates, games and forums. This type of interview

was undertaken during either the tea break or lunchtime of the programme. This is a strategy similar to that adopted by Zuboff (1988). The feedback also provided relevant data that supported the research analysis. The informal conversational interview was used because the researcher wanted to maintain maximum flexibility in order to be able to pursue a line of questioning in a direction that appeared to be appropriate, and depended upon the information that emerged from speaking to the research participants (Gubrium and Holstein, 2002). Therefore, no predetermined set of questions was prepared.

The strength of the informal conversational interview is that the interviewer is flexible and highly responsive to individual differences, situational changes and emerging information. The weakness is that it may generate less systematic data that is difficult and time consuming to classify and analyse.

For the post-training interview, this research employed the open-ended interview method. Open-ended interviews consist of a set of open-ended questions carefully worded and arranged in advance (Gubrium and Holstein, 2002). The interview questions are as illustrated in Appendix D. This type of interview is appropriate for this research because the researcher wanted to minimise the variation in the questions that are posed to the research participants. Open-ended interviews were also useful in this research because they were desirable when obtaining the same information from each interviewee at several points in time or when there were time constraints for data collection and analysis (ibid). Open-ended interviews also allowed the researcher to collect detailed data systematically and facilitate comparability among all respondents (ibid). The researcher also undertook a second open-ended interview session, which was undertaken four weeks after the first interview session.

The aim of the second open-ended interview session was to explore the themes of the first interview in the context of the following questions: “This is what I am understanding, can I confirm this with you?” “This is what I have learnt about influencing skills and sharing attitudes from you, can I determine whether this is what you meant?” “Can you identify the meaning behind this theme as explaining ideas/actions/reactions/reflections?” “There may be multiple realities from the language of the respondents, is expressing ideas/actions/reactions/reflections the key process in this theme? Does something else arise?”

The theoretical justification for returning to the participant is offered by Bleicher (1980). He states that in the dialogical process, "the concepts used by the Other, be it a text or a thou, are regained by being contained within the interpreter's comprehension. In understanding the question posed by the text we have already posed questions ourselves and, therefore, open up possibilities of meaning" (Bleicher, 1980, p. 144). In relation to the second open-ended interview session, the researcher returned to the respondents within a three-week period in order to enable transcriptions of the conversation, to send a copy of the transcript for the respondents, to develop questions and construct first level themes for discussion at the second meeting.

The strength of the open-ended interview is that the interviewer asks the same questions to each respondent with essentially the same words and in the same sequence. The weakness of this approach is that it does not permit the interviewer to pursue topics or issues that were not anticipated when the interview instrument was elaborated. Also, the open-ended interview limits the use of alternative lines of questioning with different people depending on their particular experiences. This reduces the extent to which individual differences and circumstances can be fully incorporated into the evaluation.

Bearing the strengths and weaknesses of interview in mind, it was then employed in this research. This is because, based on the above discussions, it is considered to be the favoured tool of the qualitative researcher for data collection (Denzin and Lincoln, 1994).

The differences between semi-structured interviews, the informal conversational interviews and open-ended interviews are illustrated in Table 3.1.

Table 3.1 The difference between semi-structured interviews, the informal conversational interviews and open-ended interviews

Semi-Structured Interview	Open-Ended Interview	The Informal Conversational Interview
Involve pre-determined set of questions	Involve pre-determined set of questions	No pre-determined set of questions
Free to pursue in depth certain questions	Free to react to any answer provided by the respondents	Pursue a line of questioning in a direction that appeared to be appropriate and depended upon the information that emerged from speaking to the respondents
Slightly flexible	Flexible	Highly flexible

Source: Gubrium and Holstein (2002)

Before any interview session was started, declarations about the research were made. This included describing some of the objectives of the research. At the time, the participants were made aware that the conversations were being tape-recorded. This was to assure the participants that nothing was being hidden from them and also that an element of trust existed between both parties. The interviews were conducted in Malay. This strategy was adopted to enable the participants to express their feelings on the impact of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in developing meta-abilities, influencing skills, sharing attitudes and learning-based systems confidently and conveniently.

As soon as the aforementioned interviews were completed, the recordings were transcribed. Thereafter, the findings were classified into categories close to the ones developed for the literature review. This was done in order to identify the results and to prevent the findings from being disorganised, thereby reducing the confusion when analysing the data. There were other issues, such as the relationship between the staff members, which were also obtained during the interviews; however, as the aim and scope of this research did not extend to such matters, they were disregarded.

3.4.2 Observations

The second technique used for data collection is observation. First-hand observation of a phenomenon is another important source of qualitative data for evaluation (Yin, 1994; Marshall and Rossman, 1999). The main purpose of observational evaluation is to obtain a thorough description of the research including research activities, participants and the meaning they attach to the research. It involves careful identification and an accurate description of relevant human interactions and processes (Miles and Huberman, 1994).

After the training programme, the annual plant shutdown took place in Perwaja. The annual shutdown is a period of time whereby the plants' machineries and equipments are overhauled, repaired and serviced. During this period, all the engineers were in the plants; therefore, it was hard to meet them. Furthermore, the director of Human Resources advised the researcher to postpone the research activity during the annual shutdown period. For this reason, the observation process could not be undertaken in an intensive manner.

However, there were two occasions where the observations took place in this research: (1) during the training programme and (2) during the open-ended interview sessions.

In this research, the observation involved the systematic noting and recording of activities, behaviours and physical objects in the evaluation setting, acting as an unobtrusive observer (Yin, 1994). The main advantage of this method was that the participants were not aware that they were being observed; therefore, they were less likely to change their behaviour and compromise the validity of the evaluation (ibid).

The aim of the observations during the training programme was to ensure that the level of understanding of the six competency sets amongst the research participants was at a satisfactory level. The understanding was at a satisfactory level when the participants could give a correct or logical answer to any discussed issues. During this process, the researcher observed how the research participants responded to the highlighted issues, behaved and interacted with each other in the lecture room. In the meantime, the researcher undertook the systematic noting and recording of activities, behaviours and physical objects in the training programme. For example, when discussing the importance of having discussion with the colleagues, the participants highlighted the unwillingness from the superior's side to create such an environment in the workplace. When discussing this issue, the researcher wrote down the participants' views and the way they expressed them in the notebook. Observations were also undertaken during the interview sessions. This was to ensure a high level of data relevancy and reliability.

In the pilot case, the researcher undertook participant observation. Participant observation is at one end of the participation spectrum and consists of the researcher becoming a member of the community or population being studied (Yin, 1994). This method enabled the researcher to see the impact of meta-abilities on tacit knowledge externalisation and consequently learning-based systems development amongst the research participants. During this stage, the researcher participated in activities of the participants, observed how they behaved and interacted with each other and other colleagues. For example, the researcher sat in the academic unit meeting and observed the way the research participants contributed in the meeting.

The strength of the observations is that the researcher is able to experience and, presumably, better understand any of the project's impacts (Yin, 1994). The main

weakness is that it is likely to alter the behaviour of the person being observed (ibid). Additionally, ethical issues may arise if the researcher misrepresents himself/herself in order to be accepted by the community being studied (ibid). Bearing the strengths and weaknesses of observations in mind, it was then employed in this research. This was to establish data triangulation in this research.

3.4.3 Document Review

In addition to the above techniques, data collection also involved an intensive document review. Yin (1994) found that researchers supplement observational fieldwork and interviewing with gathering and analysing documentary material, such as those detailing laws, regulations, contracts, correspondence, memoranda and routine records on services and clients. These kinds of documents are a useful source of information on activities and processes, and can generate ideas for questions that can be pursued through observation and interviewing (ibid).

Archival document reviews were undertaken intensively during the stage of understanding the operational background of the organisations used for this research and the preparation of the training programme. In order to understand the operational background of organisations used for this research, the researcher gathered and analysed the documentary materials such as the company profile and background, management summary, analysis reports, organisational structure, departmental functionality, job descriptions and an overview of the Malaysian steel industry. To prepare the module and the outline of the training programme, documentary materials such as research reports, training policies, approaches and modules were gathered, analysed in depth and in an intensive manner.

In Perwaja, however, the work-related documents could not be studied in an intensive manner. This was due to the department of engineering works undertaking tasks focused upon complicated drawings and mathematical formulas. This posed to be a problem as the data was beyond the understanding capability of the researcher.

A major advantage of this method is that the documents were generated contemporaneously with the events they referred to. Hence, they are less likely to be subject to memory decay or memory distortion compared with data obtained from an interview. However, an important disadvantage is that they may be subject to selective-

deposit or selective-survival bias. Bearing the strengths and weaknesses of document review in mind, it was then employed in this research. For the case of observations, this was to establish data triangulation in this research.

3.4.4 Training Programme Evaluation Form

Apart from the above data collection techniques, this research also utilised a training programme evaluation form. There were three main reasons associated with using an evaluation form in this research. First, the researcher wanted to determine the relevancy of the adopted training approaches in instilling the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. Second, the researcher wanted to ensure that the participants understood and applied the competencies discussed in the programme. Third, the researcher wanted to evaluate the relevancy of the contents of the module in instilling the six competency sets.

The research participants were given the training programme evaluation form at the end of the training session. This was because the researcher wanted to evaluate the relevancy of the adopted training approaches in instilling the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. However, it should be kept in mind that the evaluation findings are not intended to answer the research questions for this research. The findings are to ensure that the undertaken training programme is successful and effective. It is argued that a successful and effective training programme enables an effective embedding of the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in the research participants' mindset. This phenomenon in turn provides a relevant platform to study the impact of the six competency sets in enabling tacit knowledge externalisation and sharing within the case study.

A sample of the training programme evaluation form is attached in Appendix B. The questionnaire consists of 13 training evaluation issues. These evaluation issues were considered appropriate in evaluating the training programme because they encompassed the elements of lecturer, research participants and teaching styles. The questionnaire used rating scales of 1 to 5 (where 5 = excellent and 1 = unacceptable). A 5-point scale was utilised because the researcher wanted to group participants into two categories, which were the participants that gained impact from the programme (4 and 5) and the participants

that gained no impact from the programme (1 and 2). A point scale of 3 was excluded since it represented a neutral point of view in the evaluation process. After receiving the forms, the data was analysed to determine the mean value of each appraisal issue.

The strength of the training programme evaluation form is that the researcher is able to determine whether or not the training programme is the factor that reduces the project's impacts. The main weakness is that it is quantitative in nature and therefore contradicts with the nature of this research. Nevertheless, as the evaluation findings are not intended to answer the research questions for this research, the reliability of the empirical findings of this research is not jeopardised. Bearing the strengths and weaknesses of the training programme evaluation form in mind, it was then employed in this research. This was to enable the researcher to establish data triangulation in this research.

Whilst this section discussed the data collection techniques of this research, the next section will offer brief descriptions and definitions of this research data analysis.

3.5 Part IV: Data Analysis

As mentioned above, this research utilised the qualitative research method. To complement the research process, an analysis of the findings was required. The reasoning descriptions and definitions are offered in this section.

Although a clear distinction between data gathering and data analysis is commonly made in quantitative research, such a distinction is problematic for many qualitative researchers. For example, from a hermeneutic perspective it is assumed that the researcher's presuppositions affect the gathering of the data – the questions posed to informants largely determine what one will find out. The analysis affects the data and the data affect the analysis in significant ways. Therefore it is perhaps more accurate to speak of a "mode of analysis" rather than "data analysis" in qualitative research (Myers and Avison, 2002).

This research used the hermeneutics analysis method. Hermeneutics can be treated as both an underlying philosophy and a specific mode of analysis (Bleicher, 1980; Myers and Avison, 2002). As a philosophical approach to human understanding, it provides the philosophical grounding for interpretivism. As a mode of analysis, it suggests a way of understanding textual data.

Hermeneutics is an approach to the analysis of texts that stresses how prior understandings and prejudices shape the iterative process (Denzin and Lincoln, 1994). Hermeneutics is primarily concerned with the meaning of a text or text-analogue (an example of a text-analogue is an organisation which the researcher comes to understand through oral or written text) (Myers, 1997). The basic question in hermeneutics is "what is the meaning of this text?" (Radnitzky, 1970). Taylor (1976) says that:

> Interpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory – in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense.

The aim of hermeneutic analysis becomes one of trying to make sense of the whole, and the relationship between people, the organisation and the externalisation and sharing of tacit knowledge. For example, when the research participants mentioned that their meta-abilities were improved, it was learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse could be used to develop other members' meta-abilities. To achieve this, the following research activities were undertaken.

From the above discussions, the first process in the hermeneutics analysis is obtaining a text or text-analogue (Gadamer, 1976). As noted above, to obtain a text or text-analogue, the researcher undertook interviews, observations and document reviews. This process involves hearing and writing the participants' stories. For example, when the participants were asked about the impact of the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse on the development of meta-abilities, the researcher recorded their answers using a Dictaphone. As soon as the aforementioned interviews were completed, the recordings were transcribed. The transcription represented the text that will be analysed in depth. For analysis illustrative purposes, the following text is utilised:

> From an active communication programme that I promoted in my unit after the programme, my staff were not hesitant to meet me for any technical or non-technical assistance. I tried my best to assist them and if I thought that it was not under my expertise, I referred them to the right person, but still under my supervision. So...yeah...through

asking activities, the work could be undertaken smoothly. Furthermore, we should learn from many experts, not only ones specific to the nature of the problem.

After obtaining the participants' stories, the researcher interpreted them in order to develop their meaning. The stories or texts were interpreted by eliciting the significant statements that could be detected in them. Identifying significant statements was a strategy taken from Colaizzi (1978) and Van Manen (1990). In other words, the researcher produced the themes of the collected data by using personal reflection. For example, the significant statements of the above text are as follows:

- Gain confidence to express a problem to the top people
- Promote a communication culture in the unit
- Remind about late project
- Share work-related information actively

After determining the significant statements for meta-abilities, influencing skills and sharing attitudes, the researcher developed the generic themes for them. For example, the generic themes for the above significant statements are as follows:

- Highlight an issue in the formal or informal discussion
- Interact with others for task improvement

The above generic themes are termed as the first level theme (Clarke, 1999). This is because this research intended to further examine the validity of the first level theme by using second conversation. From the second interview session, the researcher was able to learn the themes through dialogue. At this stage, the first level themes were presented to the research participants to validate their reliability and relevancy. For example, the theme that the participants interacted with others for task improvement was presented to the participants and they were asked whether the developed theme was relevant or not.

As was practised in the first interview, the responses from the participants were tape-recorded. The researcher then transcribed the audio-taped information and transformed them into text. The researcher then elicited the significant statements that can be detected from the second conversation text. The themes that are developed from the significant statements of the second conversation text are termed as the second level

themes (Clarke, 1999). This is because they are obtained from the second interview. The summary of this process is illustrated in Table 3.2. Once the second level themes were identified, the researcher developed the generic themes that represent the first and second level themes. In this case, the researcher identified the common concepts that were shared by both themes. As this category represented one participant, it is termed as an individual category (ibid).

Table 3.2 The illustration of respondents' themes to categories

First Level Themes	Second Level Themes	Individual Category
Highlight issue in the formal or informal discussion	Became confident to highlight issue in the meeting for unit development	Gain confidence to express ideas for unit development
Interact with others for task improvement	Willingness to face problem acutely and collectively for the sake of the company	Determine action acutely and collectively

In the search for the categories, however, Frank (1997, p. 85) suggests that categories "are not an end in themselves", rather they show the willingness of the researcher to "stay tuned" to the participants and they also aid the researcher to "observe how they adapt and transform new situations, reinventing the meaning of their activities and lives."

The completion of determining individual categories is followed by the construction of major categories. This process involves the incorporation of several individual categories into the major category (Clarke, 1999). The example for the construction of s major category from the three individual categories is illustrated in Table 3.3.

Table 3.3 The illustration of the construction of major category

Major Category	Individual Category
The confidence to express ideas	Participant A: Gain confidence to express ideas in the workplace Participant B: Feel responsible to express ideas and concerns for unit development Participant C: Gain confidence to express ideas for unit development

The major category becomes the basis for the researchers to reflect and consequently validate the theoretical information that is obtained in Chapter 2. The

descriptions of the analysis trail of this research are offered in Chapter 6. The way in which the above analysis activities relate to each other are illustrated in Figure 3.1.

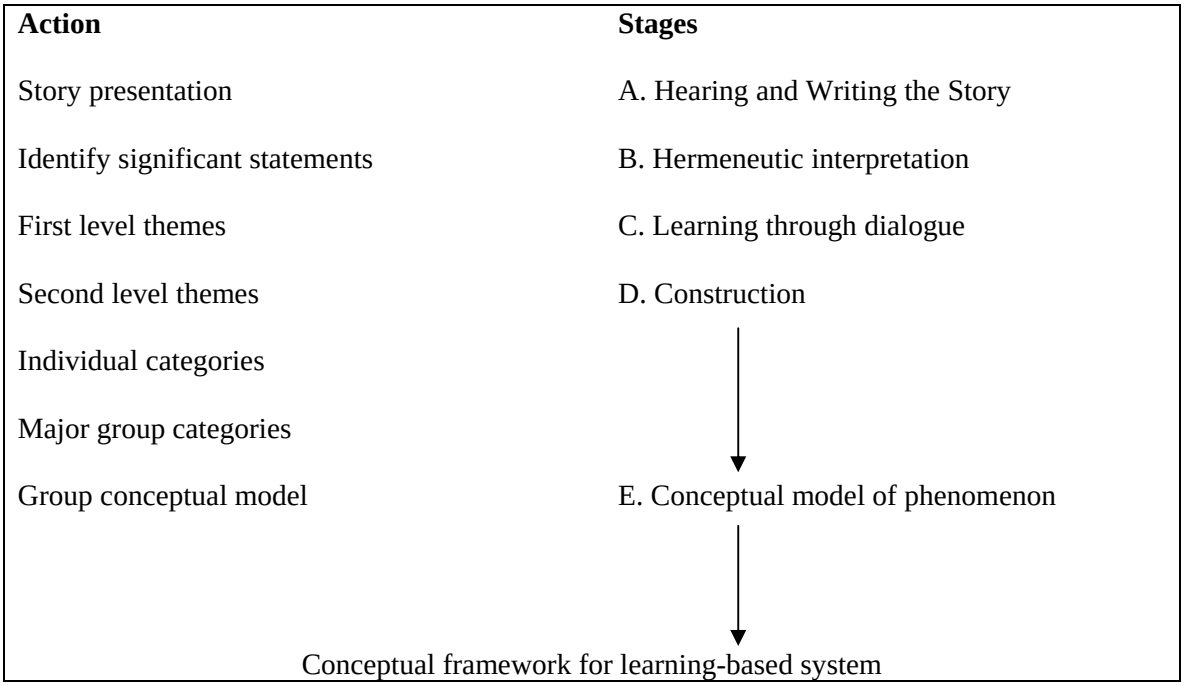

Figure 3.1 Diagrammatic representation of analysis process
Source: Clarke (1999)

3.6 Research Diagram

The ways in which the aforementioned research activities relate to each other are illustrated in Figure 3.2.

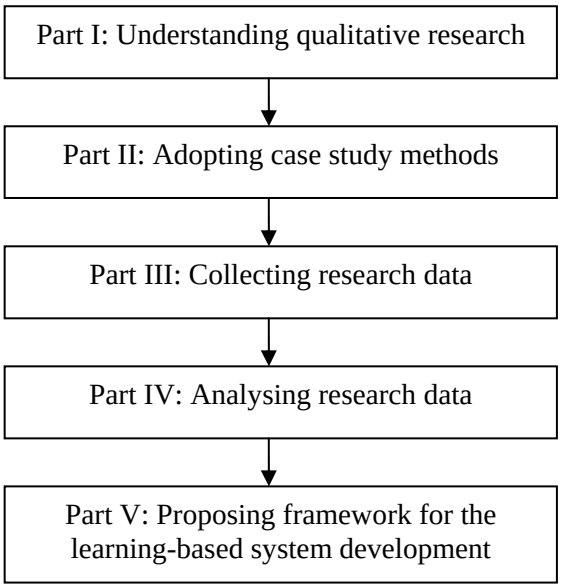

Figure 3.2 Diagrammatic representation of research activities

3.7 The Triangulation Strategy

As mentioned above, qualitative data were gathered from personal interviews and document materials. During the research, direct observation was also executed to some extent.

All these approaches towards data collection were intended to put into practice the concept of triangulation to reduce a systematic bias in research work. Patton (1990, p. 470) defines triangulation in research as a process by which the researcher can guard against the accusation that a study's findings are simply an artefact of a single method, a single source, or a single investigator's bias. However, Miles and Huberman (1994, p. 266) mention that "stripped to its basic, triangulation is supposed to support a finding by illustrating that independent measures of it agree with it or at least, do not contradict it." They also say that triangulation as defined by Denzin (1978) is a way of acquiring the findings in the first place.

Another important issue in this research is personal bias due to the dependence upon a researcher's personal attributes and skills. The issue of personal bias is dealt with by using two strategies. First, the triangulation of data sources (personal interviews, document materials and observation) will be employed in this research. Second, the idea of keeping two voices separate – emic (insiders'/participants' voice) and etic (outsider's/researcher's voice) – will be applied as much as possible in the data, using the emic voice as the predominant voice in the text.

To recapitulate, the triangulation of data sources and the idea of keeping emic and etic separate were the verification and validation processes pursued in this research. All these were not only used to increase the "sophisticated rigor" of the data collection and analysis, but also to help disclose the "richness" of social settings for a qualitative inquiry (Neuman, 1991, pp. 329-330).

3.8 Summary

The study of a complex phenomenon such as the impact of a six competency set on the externalisation and sharing of tacit knowledge demands in-depth and detailed research work, in and out of the field. The decision to adopt the qualitative case study format fits with the everyday reality of six competency sets and tacit knowledge externalisation. This

is because the six competency sets and tacit knowledge externalisation are marked by various complications, struggles and any other specifics that are "part and parcel" of the knowledge exploitation.

This research represents an initial attempt to understand the impact of the six competency sets upon the externalisation and sharing of tacit knowledge and, consequently, IS development. In other words, meta-abilities, influencing skills and sharing attitudes are understood to be interrelated to the dynamics of the wider tacit knowledge externalisation context, of which they are an integral part. The role of six competency sets in tacit knowledge externalisation in this respect is not understood as a neutral set of abilities, but as an integral part of assisting individuals in the contribution of an effective business performance. This is achieved by enabling the "best practices" in functioning business activities that are documented and stored within the organisational IS.

By and large, the qualitative data is most appropriate for investigating the role of six competency sets in the externalisation and sharing of tacit knowledge. This is because it recognises that the six competency sets and tacit knowledge externalisation are cultural products, not a natural phenomenon.

4 CHAPTER FOUR: Describing and Discussing the Pilot Study

4.1 Introduction

This chapter provides empirical results for the pilot study that was used to refine the training module and research techniques. The refined module and techniques in turn will be used to further collate and analyse data for the case study. The chapter describes only the results of the pilot case of this research. The lessons learned are used to develop the conceptual framework of this research. The reasons for undertaking the pilot are also provided.

4.2 Reasons for Undertaking the Pilot Study

The term "pilot study" is used in two different ways in social science research. It can refer to so-called feasibility studies, which are "small scale version[s] or trial run[s], done in preparation for the major study" (Polit *et al.*, 2001). However, a pilot study can also be the pre-trial or "trying out" of a particular research instrument (Baker, 1994). One of the advantages of conducting a pilot study is that it might provide advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too

complicated. As De Vaus (1993) stated: “Do not take the risk. Pilot test first.” These are important reasons for undertaking a pilot study in this research.

A pilot case study has been described by Yin (2003) as a study which can “help investigators to refine their data collection plans with respect to both the content of the data and the procedures to be followed.” Yin (2003) also noted that pilot cases assist research by allowing the researchers to develop relevant lines of questioning. Thus this view is upheld by the pursued research strategy.

At the same time, Yin (2003) also warns that a pilot is not a pre-test. Allowing the investigator to develop relevant lines of questioning is a formative use of the pilot study. A pre-test, on the other hand, is the intended data collection plan employed as a final test run; in other words, a pre-test is a “formal dress rehearsal” (Yin, 2003). He provides an additional warning, that it has been noted that many researchers utilise the collected data from a pilot study in an analysis of subsequent case studies. “You should not permit slippage from the exploratory (or pilot) phase into the actual case study to occur” (Yin, 2003).

In this research, a pilot study was used to determine whether the theoretical issues identified in Chapter 2 are prevalent in practice, and to investigate whether some of the training modules and research techniques developed for the research are suitable or require changing. The pilot case is a large organisation and operates in the service sector of Malaysia. Further descriptions about this pilot case are provided in the following sections.

As mentioned in Chapter 3, the aim of undertaking a pilot study was as follows: (1) to examine the feasibility of the theoretical information obtained from chapters 1 and 2 in a real life setting; (2) to test whether the content of the developed training module would be able to develop the six competency sets of pilot research participants and (3) to determine what an appropriate research technique of data collection involves.

In the pilot study, the initial constructs for the research were ground only in the theoretical background information obtained from chapters 1 and 2. For instance, when attempting to develop the contents of the training module, the background literature assisted in providing inputs that could be referred to. During the training programme, as interactive discussions took place between the research participants and the researcher, clarity about the contents of the training module focusing on the elements of understanding

organisational roles, internal strengths, formal and informal discussions, rational discourse, meta-abilities, influencing skills and sharing attitudes have the potential to be made more precise and comprehensive. For example, when discussing the importance of influencing skills with the research participants, it was brought to the attention of the researcher that there were two main obstacles. One was the difference in the organisational hierarchy and the other was the negative perception towards other organisational members. Therefore by discussing influencing skills, such issues were brought to the forefront. Using the same format of discussions resulted in an improved construction of the previous training module.

During the interview sessions, when attempting to determine whether the six competency sets were being practised in the workplace, the background literature assisted in providing definitions which could be referred to. As questioning occurred between the research participants and the interviewer, it emerged that improvements could be made to the questions so that they are composed in a manner that is comprehensive and precise with a focus on the six competency sets. For example, when questioning the research participants about the post-training influencing skills, the replies emphasised to the researcher that influencing activities can be undertaken actively with colleagues or subordinates. This was because communicating with people at the same level is much easier than at management level. Therefore, when questioning the impact of the training programme on influencing skills was undertaken, such issues were brought to the forefront.

To recapitulate, the pilot assisted in refining the training module, research techniques and clarifying unclear issues. Thus, the pilot was used to avoid any risks associated with incomprehensible training contents, research data collection techniques and conceptual framework. It was felt that the study was very critical to the research as it was a means of reducing the risks involved by following a blind path, where no clarification or development of issues is made. That is, by conducting a pre-trial of the training module, the research was able to modify the contents in such a manner that the research participants could obtain relevant and comprehensible information. Alternatively, by conducting a pre-trial of the questions, the researcher was able to modify them in such a way that the most relevant information could be obtained for the research. This assisted in forming better constructs for the research.

4.3 Reasons for Undertaking the Pilot Study at Universiti Utara Malaysia

As mentioned in Chapter 3, the pilot study of this research was undertaken at Universiti Utara Malaysia, one of the higher education institutions in Malaysia. This section discusses the reasons for undertaking the pilot study in an academic institution.

When selecting the pilot studies, Yin (2003) observed that the reasons for selecting a particular site could be due to convenience, access and geographic proximity. The reasons for selecting the pilot were convenience and accessibility. Universiti Utara Malaysia is the employer of the researcher. Therefore, contact could be established easily and a rapport already existed. Additionally, contact was established faster and access to information and the selected research participants was provided easily.

From this research point of view, the abilities to externalise and share tacit knowledge must first be instilled in the participants' mind before their impact in a real life setting can be studied. This is because individuals must have an existing interest and know the things that they want to apply in their daily activities. Therefore, this research needs to create the interest and instil an understanding of the abilities to externalise and share tacit knowledge. To fulfil this requirement, a training module was developed in this research. Without having this module, the participants will be confused about how to utilise their knowledge and skills in problematic situations as there is no platform in their mindsets or benchmark measure to refer to. This confusion can demotivate staff members from using their knowledge and skills and in turn reduce willingness to externalise, share and document them. The training module of this research is illustrated in Appendix E.

In the pilot case, the participants consisted of 11 lecturers and a single resource centre officer. Being lecturers, the participants could offer valuable inputs on the relevancy of the module in developing the abilities to externalise and share tacit knowledge. These inputs were beneficial in further refining the training module. Additionally, the impact of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse on knowledge can be studied extensively. This was because as academicians, the research participants can evaluate the relevancy of the proposed elements in supporting the process of knowledge development and utilisation. Contrastingly, the resource centre officer could provide information on the impact of the proposed elements on the development of IS. This information is important because this

research focuses on the learning-based systems development. Therefore, the combination of these two groups of people can inform this research on how to investigate the abilities to externalise and share tacit knowledge in a practical situation.

Additionally, as this research intends to determine the suitability of the adopted research techniques by using a pilot, obtaining inputs from the academicians is considered beneficial. Being equipped with the skills to undertake academic research, the participants can give inputs whether the adopted research techniques can achieve the aims and objectives of this research. These inputs were beneficial in further refining the adopted research techniques. Therefore, undertaking a pilot study in an academic institution is considered beneficial in assisting this research in achieving its aims and objectives.

To recapitulate, due to the requirement to refine the training module and research techniques of this research, using an academic context in the pilot study was considered appropriate. Furthermore, as a rapport existed, undertaking the training programme to instil the abilities to externalise and share tacit knowledge amongst participants will be much easier. This training programme in turn can become a platform for the researcher to prepare himself before undertaking the training in a real case study or an industrial context.

Whilst this section discussed the reasons for undertaking a pilot study in an academic institution, the next section will offer descriptions about the way the constructs of this research were formed.

4.4 Undertaking the Pilot Case

When the training module, interview questions and theoretical framework for the pilot study were formed, the research was still in the early stages. This was a very theoretical stage with knowledge only about the issues regarding tacit knowledge externalisation, the composition of meta-abilities, influencing skills and sharing attitudes and their impact on the development of IS for OL being guided by the literature. This meant that the constructs were very closely linked to the theory. In the following subsections, a description about the way that the constructs were formed is given.

4.4.1 The Externalisation and Sharing of Tacit Knowledge

From the literature review, a number of issues were concentrated on; namely, developing the six competency sets, establishing the systems for promoting learning, and

diffusing tacit knowledge. The externalisation and sharing of tacit knowledge have been utilised to enable knowledge creation and are assertions in OL theory; however, there is little to substantiate that this could be easily established in a real life situation. To examine such situations in a real life context, this research undertook a pilot study.

As mentioned in Chapter 3, the pilot case involved the implementation of the training programme in order to instil the six competency sets, which were instrumental in externalising and sharing of tacit knowledge amongst the participants. The findings from the literature review were utilised to design the module and these were presented to the participants. As mentioned in Chapter 2, the training programme was based on the acquisition of understanding the organisational roles, internal strengths, ability to handle formal and informal discussion and the ability to conduct rational discourse.

To improve the training module, the issue of externalising and sharing of tacit knowledge was discussed in the training programme. Sometimes, the research participants used this discussion to relate some of their experiences. The questions at the time asked, "What do you think about sharing ideas in the workplace? Were you able to express your views in the meeting? Could you describe the stumbling blocks in expressing your views?" The research participants agreed unanimously that the sharing of ideas was important in the workplace. However, there were several stumbling blocks that discouraged them from expressing or sharing their tacit knowledge in the workplace, such as unwillingness, lack of confidence, anxiety, confusion and being carried away by strong feelings. These elements, based on the discussion made in the programme, became an additional impediment for progression. All the responses that were shared by the research participants were recorded in a notebook. The researcher utilised the notebook in order to maintain the informality of the discussion. This was because the researcher could write something in the notebook without being noticed.

After analysing the information in the notebook, it was found that confidence and a sense of responsibility were critical in externalising and sharing tacit knowledge. This was because most of the research participants expressed concerns that they would lose their job if opposition to a superior's irrational decisions occurred. In addition, the research participants highlighted the important role of inquisitive tendencies or obtaining clarification from others. In this case, the research participants argued that staff members have to ensure that the given tasks are undertaken according to the accepted or agreed

procedures. To achieve this, the staff members have to obtain clarification from the manager or experts before undertaking bewildering tasks or solving difficult problems. This finding was not surprising, as most of the research participants were those at the executive level. Based on this feedback, the researcher revised the training module to include the element of inquisitive tendencies.

As a result of the addition of inquisitive tendencies, the elements of study of this research became seven, which are cognitive skills, self-knowledge, emotional resilience, personal drive, influencing skills, sharing attitudes and inquisitive tendencies. Therefore, the term "six competency sets" was changed to "seven competency sets." This finding also means that the conceptual framework and propositions that are illustrated in sections 2.6 and 2.7 respectively require a change. The descriptions and definitions of the revised conceptual framework are dealt with in Section 4.8.

The above findings are similar to a statement made by Butcher *et al.* (1997) whereby individuals were considered to have an important role in organisational development. It can also be seen that the findings were very close to the theoretical details in Chapter 2. However, it was also concluded at the next training programme that the question should be rephrased to ask, "Were you confident enough in expressing your views in the meeting?", "Were you confident enough in obtaining clarifications from others?", "Do you feel a responsibility to express views in the meeting?" This was to highlight the value of personal confidence to the research participants at the beginning stage of the training programme.

After highlighting the importance of externalising and sharing tacit knowledge in the workplace, the aim of the training programme, which was to instil the competency to externalise tacit knowledge, was then achieved. This enabled the research participants to appreciate the elements that were discussed and shared during the programme. By appreciating the programme, it was argued that attention from the research participants could be optimised. This resulted in a significant development of the seven competency sets within the research participants. The details of the process of developing the seven competency sets are given in the following subsection.

4.4.2 The Development of Meta-Abilities, Influencing Skills, Sharing Attitudes and Inquisitive Tendencies

With regards to the role of confidence and the sense of responsibility in enabling the externalisation and sharing of tacit knowledge, this research intended to determine how to develop such values within the organisation. Thereafter, as more information was obtained both from the literature review and practical experiences, the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse were considered for the research.

Before organisational roles, internal strengths, formal and informal discussions and rational discourse in developing confidence and the sense of responsibility and, in turn, tacit knowledge externalisation could be studied, it was realised that the competencies should first be instilled in the research participant's mindset. This is because it is illogical to evaluate the impact of an element that does not exist in an individual. Therefore, the process of developing a training module specifically for that purpose was pursued. In this case, the process followed was as

- Read the literature.
- Construct modules based upon the literature findings. For instance, when dealing with the emotional resilience, the elements to develop the ability to manage the emotions appropriately, such as compassion, discourse skills and individual appreciation were provided.
- Select appropriate business case studies, such as the political dilemma and operational issue in order to relate the subject of discussion with the practical situations. The appropriate business case studies were determined based on the moral value that could be elicited or gained from them.

The aim of the training module was to instil the values of confidence and the sense of responsibility through the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. Following the completion of the module, the training programme commenced. The length of the programme was six days due to the policy of the faculty on internal training. Due to its highly developmental nature, the following strategy was adopted in order to further improve the content of the training module. Initially, the researcher posed provoking questions to the participants. For instance, to develop their emotional resilience, the

questions asked were: "What should be done if your boss provided a harsh criticism of your work?" and "How do you deal with people who reject your work?" Due to the number of the participants, normally there were more than 12 views for every question. These views were then discussed in a collective and harmonious manner in the meeting room. During the discussion, every participant was allowed to comment upon the others' views. This strategy was followed for all the humanistic elements discussed during the training programme.

During the discussion, the researcher recorded all the participants' views in the notebook. This included the synergistic views that were generated by the researcher when concluding a discussion session. For example, after discussing the problems associated with the establishing of a good meeting, the researcher would offer advice on how to interact with others in a meeting. In addition to this, the researcher posed questions relating to the effectiveness of the lectures and the level of understanding of the seven competency sets during the tea break and at lunchtime. The questioning was in the following form: "Do you understand the elements that have been discussed? Do you have anything else to ask?" After analysing the information in the notebook and transcribing the conversation, it was noted that the participants fully appreciated the elements that were discussed in the programme. This feedback was then used to further improve the content of the training module.

To examine the impact of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in externalising and sharing of tacit knowledge, the research participants were asked these questions during the interview: "Has attendance on the programme had any impact on your meta-abilities? If so please describe. Has meta-abilities had any impact on your confidence and sense of responsibility to influence, ask and share knowledge with others in the organisation? If so please describe." It can be seen that the questions were very close to the theoretical findings in Chapter 2. The responses received were that meta-abilities developed within individuals, increased their confidence and sense of responsibility to influence, ask and share knowledge with others in the organisation, but hinged on the level of that person.

Using this experience, the questioning at the next research phase involved amending and posing more suitable questions. The researcher then asked "Has meta-abilities had any impact on your confidence and sense of responsibility to influence, ask

and share knowledge with your colleagues or subordinates? Has meta-abilities had any impact on your confidence and sense of responsibility to influence, ask and share knowledge with your superiors?" This amended form of questioning led to more suitable answers.

Whilst this subsection discussed the role of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in developing meta-abilities and tacit knowledge externalisation, the next subsection will offer descriptions of their impact on establishing an IS for OL.

4.4.3 The Establishing of Information Systems for Organisational Learning

With regards to the establishing of IS for OL, the research intended to identify several post-training issues. Initially, the research intended to identify whether the influencing, sharing and inquiring activities enabled the research participants to externalise their tacit knowledge in the form of an I-A-R-R continuum (as discussed in Chapter 2).

It has to be understood that in the earlier stages of this research, the focus was a purely theoretical one. That is, the researcher had not experienced instances such that the theoretical issues could be related to the practical examples; therefore, the questions were very theoretically focused. As a result, the questions were phrased in examples such as "Do you agree that by influencing, sharing and inquiring activities you are able to express ideas, actions, reactions and reflections more effectively?" Before the participants replied, a clarification about the context in which the influencing, sharing and inquiring activities were being referred to was sought. This also assisted the research for the next cycle involving other participants. For the next set of participants, the question was clarified by providing the definition of influencing, sharing and inquiring activities provided by Butcher *et al.* (1997).

Thereafter, issues that became vital for this research were: "Can documenting ideas, actions, reactions and reflections provide relevant inputs for IS development? How is it possible to document the externalised ideas, actions, reactions and reflections? Can the continuous development of IS contents promote learning in the organisation?" When the research participants were posed the questions relating to these issues, the questioning was in the following form: "Do you agree that documenting ideas, actions, reactions and reflections can provide relevant inputs for IS development? Do you have any experience of

that? Who is responsible for documenting the externalised ideas, actions, reactions and reflections? Does this process enable IS content to be updated for OL?"

It can be seen that the questions were very closely linked to the theoretical finding in Chapter 2. The responses received were that the externalised tacit knowledge through the medium of influencing, sharing and inquiring activities enabled continuous IS development and, in turn, OL. Questioning the documentation process resulted in a clarification of how to document the I-A-R-R continuum. This also assisted the research for the next participants. For the next set of participants, the questions were clarified by providing the method of documentation provided by Karhu (2002).

Based on the aforementioned experience, the questioning during the pilot case phase was amended and maintained. This form of questioning led to a reasonable and suitable answer. It was at this point that it was declared that the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse were considered key to the development of seven competency sets, tacit knowledge externalisation and OL-based IS.

4.5 Describing the Pilot Case

It was imperative for this research that any organisation used for the research should possess an instance of a gap between IS development and the organisational members' involvement. Besides this, the participating organisation had to consent allocating its members to the special training programme in order to reduce the gap using the medium of the seven competency sets. Therefore the research had to use an organisation that the researcher was well acquainted with and had an intimate relationship with. Ultimately, an academic faculty in one of the Malaysian higher education institutions was chosen.

As an academic institution, one of its main activities involved promoting research amongst its staff. A research centre was established in 2000 in order to assist the staff with the research process. Additionally, the centre was also responsible for managing the database of the centre. A sole officer was assigned to manage the database. The database contained information relating to the academic material owned by the centre, borrowed and returned materials, approved research proposals, research in progress, completed research and the publication of the working paper series. An interview with the officer revealed that

there were many undetected academic materials. This caused disruption in the research support process. Additionally, the process of updating the faculty research of current and future research activities could not be undertaken effectively, due to the lack of cooperation from the academic staff.

Thereafter, one discussion was held with the Dean of the faculty to determine a solution to the above issue. During the meeting, the concept of understanding organisational roles, internal strengths, formal and informal discussions, rational discourse and the seven competency sets was shared and described. The researcher also stressed the importance of the seven competency sets within the organisation and tacit knowledge sharing and externalisation. The impact of that process for organisational development was also highlighted. To instil the elements of understanding organisational roles, internal strengths, formal and informal discussions, rational discourse and seven competency sets, the researcher mentioned the need to undertake a training programme. After the meeting, the Dean agreed to participate in this research programme. Based on the researcher's proposal, the Dean then selected the participants of this research.

4.5.1 Undertaking the Training Programme

As mentioned in Chapter 3, the training programme was undertaken after understanding the background of the research site. Before the training programme could be undertaken, preparation was conducted for the following: (1) programme materials such as, the modules, presentation slides and programme outline; (2) undertaking the programme and (3) undertaking the progress review.

To prepare the module, the researcher undertook an intensive library research at Universiti Utara Malaysia and referred to some material from the Cranfield University General Management Programme, and Butcher *et al's* (1997) developing businesses through developing individuals' research reports. These sources were referred to because they provided basic descriptions and definitions of meta-abilities, which were essential in determining the elements that were relevant in developing meta-abilities. The summary of the training module is given in Appendix E. The module was based on the acquisition of understanding organisational roles, internal strengths, ability to handle formal and informal discussion and the ability to conduct rational discourse. Based on the completed module, the presentation slides and programme outline were then prepared.

The training programme was underpinned by the elements of understanding organisational roles, internal strengths, the ability to handle formal and informal discussion and the ability to conduct rational discourse. These elements are argued to be able to promote the development of the seven competency sets. The seven competency sets were: (1) influencing skills; (2) sharing attitudes; (3) inquisitive tendencies; (4) cognitive skills; (5) self-knowledge; (6) emotional resilience and (7) personal drive. The first three sets were groupings of specific competencies that were pertinent for the externalisation and sharing of tacit knowledge. The remaining four were what Butcher *et al.* (1997) termed as meta-abilities and captured important underlying psychological factors that are essential to the performance of more specific competencies. In short, the material assisted in developing an individual's motivation and willingness to externalise and share their tacit knowledge effectively. This externalised and shared tacit knowledge could then provide synergistic inputs for a continuous development of IS (Selamat and Choudrie, 2004). Being continuously updated, it is argued that the systems can promote learning because staff members can gain new insights in performing tasks (ibid).

The training programme was conducted at the pilot site in one of the meeting rooms and was conducted face-to-face between the researcher and research participants. A face-to-face meeting was utilised as it provides flexibility in the questioning process, control of the meeting situation and provides the opportunity of obtaining additional information, such as the background information or natural reactions. On the first day of the programme, the module and programme outline were distributed using a hard copy to the research participants. The programme materials were prepared in hard copy so that the participants could refer to them during the discussion. The researcher utilised Microsoft PowerPoint software to present the presentation slides. The programme incorporated a variety of features and activities to enhance the learning experience and maximise the personal benefits. These included: (1) interactive lectures; (2) syndicate group work; (3) work on live business and IS issues, (4) profiling questionnaires; (5) case studies; (6) one-to-one tutorials or coaching; (7) individual work and (8) a one-day follow up.

During the training programme at the pilot site, it was brought to the attention of the researcher that organisational hierarchy, superiority and seniority were the determinants that identified whether the influencing, sharing and inquiring activities could be established. Additionally, the participants' negative perceptions towards others

demotivated them from gaining ideas from others. This is an issue that was absent in the literature and assisted the researcher in the subsequent case study. In this case, after the training programme, the researcher started searching for the business cases that could be used to highlight the issues of organisational hierarchy, superiority and seniority. At the same time, the researcher prepared the values that will be shared with the research participants in order to effectively tackle the issues in the workplace. Examples of the values are respecting someone's rights, compassion, collective work and communication skills.

On the final day of the programme, the research participants constructed a comprehensive 60 day action plan that contained personal development and organisational change issues. This formed the basis of the progress review. For the progress review, the researcher met the participants again in order to further develop the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse by discussing their achievements on the targeted actions. Any problems that arose during the developmental period were discussed and tackled at a face-to-face meeting. This meeting was held in the research participants' room. One month after the progress review session, the data collection commenced.

During the data collection stage, an interview was held in the research participants' room. From the interviews, it was highlighted that, to set an example, the superiors should create an environment that is conducive for knowledge sharing in the organisation. The research participants commented that without the superiors' active role it was difficult to establish a knowledge sharing culture within the organisation. This is something that the researcher highlighted in the next training programme and used relevant business cases to support this issue. However, the research held the view that this obstacle could be overcome by the value of confidence and a sense of responsibility.

Finally, the questions posed to the first research participants in the pilot study were much broader and less focused upon the research issues than to the other participants. This is something that was also confirmed by Yin (2003): "The inquiry for the pilot case can be much broader and less focused than the ultimate data collection plan." For example, at a very early post-training data collection stage, the researcher asked about the participant's level of meta-abilities. After the interview, it was concluded that a question like this should not be asked at one time. Instead, it should be broken down into four different questions,

which are those regarding the participant's level of cognitive skills, self-knowledge, emotional resilience and personal drive.

In the pilot case, the constructs used were more focused upon the theory surrounding this research than the objective of the research. This resulted in the responses not validating any conception, but substantiating the results. For example, at a very early research stage, the researcher proposed the ability in conducting rational discourse in order to promote tacit knowledge externalisation and sharing. This proposal was purely a theoretical one. However, after the pilot study, it was found that the value of rational discourse created the willingness to externalise and share tacit knowledge amongst the participants. As this was the first practical experience, the empirical results substantiated the conception that rational discourse can promote the externalisation and sharing of tacit knowledge.

As the analysis of the empirical findings were undertaken, it was found that the questions had to be focused upon other issues apart from simply proving that the earlier formed theoretical understanding is applicable in practice. Consequently, the questions were amended and it was found that there were more data in the responses than those just provided by linking the questions too closely related to theoretical understanding.

4.5.2 Evaluating the Effectiveness of the Training Programme

Before discussing the finding of the pilot study, initially the evaluation of the training programme was dealt with. From the information on the programme evaluation form, it was found that the effectiveness of the training programme was at the satisfactory level, relating to the relative effectiveness for specific appraisal issues. For each of the 13 issues, an average "effect of programme" rating was calculated using a scale of 1 to 5 (where 5 = excellent and 1 = unacceptable). The reason for using a 5-point scale is offered in section 3.4.4. The 13 issues were then arranged in descending order of this average, as shown in Table 4.1, which also records the number of responses in categories 1, 2, 4 and 5. From Table 4.1, it can be seen that the rating trends clearly indicate that the training programme was effective, which in turn indicates a high degree of understanding and appreciation of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse amongst the participants.

Table 4.1 The effectiveness of the training programme

Appraisal Issue	Average	1 & 2	4 & 5
The benefit of this lecture	4.75	-	12
The instructor's manners and professionalism	4.33	-	10
The information in the lecture	4.08	-	10
The instructor's delivery of the lecture	4.08	-	8
The instructor's appearance	4.08	-	9
The ability to ask questions	4.08	-	9
The level of formality for this lecture	4.00	-	7
The instructor's communication	4.00	-	8
The instructor's answered questions	3.92	-	8
The clarity of the lecture	3.75	-	7
The level of concentration during the lecture	3.67	-	7
The level of understanding in this lecture	3.58	-	6
The presentation of this lecture	3.42	-	5

Having discussed the effectiveness of the training programme but not its impact on the participants, the following sections will discuss the empirical results of the pilot study and relate them to the structure of the framework in Figure 2.1. The empirical results also further substantiate the effectiveness of the training programme in instilling the elements of understanding organisational roles, internal strengths, formal and informal discussions, and rational discourse amongst research participants.

4.6 Findings of the Pilot Case

From the aforementioned discussions, the researcher wanted to investigate whether the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse can develop meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies in the research participants' mindsets. In addition, the researcher wanted to investigate the impact of meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies on tacit knowledge externalisation and OL-based IS development. The answers for these research questions are offered in the following subsections.

4.6.1 Meta-Abilities: Cognitive Skills

With regards to cognitive skills, the research participants were posed with the following question during the interview session: "Has attendance on the programme had any impact on your cognitive skills? If so please describe." The research participants described changes related to the development of cognitive skills. For example:

> "Before the programme, I didn't know how to solve problems. But after the programme, I can now plan my work, know how to solve problems, such as we meet our colleagues, have a discussion and find the best solution. It was like giving us guidance in the workplace."
>
> "After the training programme, I managed to solve many problematic tasks successfully and achieved my personal targets. These achievements are backed by strong confidence and awareness and they are undertaken gradually. I feel that what I obtain from the course is complete and critical for individual development. I came back from the course with targets and a motivation to achieve them."

The aforementioned empirical results demonstrate a significant development of the research participants' ability to read situations, understand, and resolve problems. All these abilities, in turn, develop an individual's cognitive skills (Butcher *et al.*, 1997). Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing cognitive skills in this research.

4.6.2 Meta-Abilities: Self-Knowledge

To investigate the level of self-knowledge experienced by the research participants, the following question was asked during the interview session: "Has attendance on the programme had any impact on your self-knowledge? If so please describe." The overall findings showed that the research participants described increased self-knowledge as an outcome of the training programme. For example:

> "I was highly motivated to be determined and defined in my works. In addition, I was able to prioritise my works, that is undertaking a job according to its priority."
>
> "The programme influenced my working style, that is do not be too rigid or loose but average in nature. Rigidity will give negative impact to the products and loose style will reduce the progress of the work because of its size. Normally, I was not satisfied with my work, although other members appreciated it very much. In this situation, I feel that I have achieved the targets."

From the above statements, the research participants highlighted the ability to distinguish one's own needs from those of others. This skill allowed organisational members to consider a range of options in their own behaviour and to make better

judgements of what to do (Butcher *et al.*, 1997). All these abilities, in turn, develop an individual's self-knowledge (ibid). Therefore, it can be learnt that the training programme had successfully developed the research participants' self-knowledge.

4.6.3 Meta-Abilities: Emotional Resilience

Emotional resilience includes self-control, self-discipline and the ability to use emotion well to cope with pressure and adversity (Butcher *et al.*, 1997). These skills allow organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (ibid). To examine the level of emotional resilience experienced by the research participants, the following question was asked during the interview session: "Has attendance on the programme had any impact on your emotional resilience? If so please describe." From this, the research participants described increases in emotional resilience as a result of the training programme. For example:

> "I was able to face various behaviours in my colleagues and cope with them smoothly. I instilled a sense of responsibility in the company amongst my colleagues and encouraged them to do their best."
>
> "The programme developed my internal and external strengths to fulfil my responsibility in the faculty. Even from my personal observation, all the participants had showed similar changes in their commitment and willingness in developing the faculty. They became less grumpy in the workplace."

From the above statements it can be seen that the research participants experienced a profound development of self-control and discipline and the ability to use emotion well to cope with pressure and adversity. These skills allowed organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). In other words, the research participants experienced a profound development of emotional resilience. In turn, this development illustrated that the training programme had successfully developed the research participants' emotional resilience.

4.6.4 Meta-Abilities: Personal Drive

To obtain the feedback on the development of personal drive from the research participants, the following question was asked during the interview session: "Has

attendance on the programme had any impact on your personal drive? If so please describe." From this, the research participants described increases in personal drive as a result of the training programme. For example:

> "The virtuous values that were discussed in the programme, such as personal confidence, a sense of responsibility and compassion enabled me to have a positive thinking in everything that I do or face. The most significant one was self-discipline. Being equipped with this element, I am now more objective in dealing with my work."
>
> "Because of the programme I turned up in the office early. I have a strong desire to improve my skills and I taught my colleagues on how to do one task more effectively. When I undertook one task, the outcome was very encouraging and I went back home with a happy feeling."

From the above statements it can be learnt that the research participants experienced a significant development of self-motivation and determination and a willingness to take responsibility and risks. This helped organisational members to persist, motivate others and meet targets (Butcher *et al.*, 1997). In other words, the research participants experienced a significant development of personal drive. This development illustrated that the training programme had successfully developed the research participants' personal drive.

The aforementioned empirical results demonstrate a significant development of meta-abilities (cognitive skills, self-knowledge, emotional resilience and personal drive). These findings illustrate that stages A and B of the research conceptual framework (as illustrated in Figure 2.1) has been achieved. This showed that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing meta-abilities. This, in turn, justified the relevancy of the proposed elements in developing meta-abilities in this research. The following subsections will discuss the impact of meta-abilities on tacit knowledge externalisation and OL-based IS development.

4.6.5 Influencing Skills, Sharing Attitudes and Inquisitive Tendencies

After being questioned about the post-training meta-abilities, the respondents were asked about their impact on the post-training influencing skills, sharing attitudes and inquisitive tendencies. Questions included: "Have meta-abilities had any impact on your

confidence and sense of responsibility in influencing other members? Have meta-abilities had any impact on your confidence and sense of responsibility in sharing knowledge with other members? Have meta-abilities had any impact on your confidence and sense of responsibility in obtaining clarification from other members?" The participants also described increases in influencing skills, sharing attitudes and inquisitive tendencies. For example:

> "After the course, I felt more responsible towards my tasks. This sense of responsibility gives me strength to complete tasks successfully. I undertake a task without any grumpy remark. I delegate work to my colleagues according to their interest and skill. I do not want to be too bossy. Instead, I coach my colleagues and assist them according to my ability."
>
> "First and foremost, I was able to talk and communicate with others after the course. Secondly, although I was the only one who attended the programme, my unit and colleagues are benefiting from me. I work hard to instil the virtuous values that were discussed in the programme with others in the workplace."

From the aforementioned statements it can be seen that the development of meta-abilities (cognitive skills, self-knowledge, emotional resilience and personal drive) is followed by a significant development in the influencing skills, sharing attitudes and inquisitive tendencies. This finding, in turn, illustrates that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse had successfully developed the meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies in the research participants' mindsets. This highlighted, on the one hand, that stages A, B, C and D of this research conceptual framework (as illustrated in Figure 2.1) had been achieved. On the other hand, the elements of understanding organisational roles, internal strengths, formal and informal discussion, and rational discourse had also successfully developed inquisitive tendencies in the research participants' mindsets.

At this point, the impact of the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse on the development of meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies have been discussed. However, the externalisation of tacit knowledge has not yet been covered and so the next subsection will describe the externalisation of tacit knowledge through the medium of ideas, actions, reactions and reflections.

4.6.6 Externalised Tacit Knowledge: Ideas, Actions, Reactions and Reflections

Improvements in the seven competency sets helped the participants to formulate their ideas, actions and reactions more clearly, while being much more aware of how these related to others. Improvements in emotional resilience and personal drive helped the participants to gain a good reflection by being more assertive, more able to deal with conflict and more objective, yet empathic, in coaching and counselling. This situation was also experienced by the participants. For example:

> "A friend of mine and I are not shy to express our ideas and feeling in the unit meeting anymore. We just say what needs to be said and we did it. In fact, most of the unit members appreciated our ideas. Gosh, thanks for your advice."

The above results demonstrate that the participants were able to effectively externalise and share their tacit knowledge (Stage E of Figure 2.1). When relating all these issues to IS development, all the participants agreed that there could be a basis for establishing learning-oriented information. In this case, the impact that the participants were able to have was via documenting their experiences, providing inputs to the systems analyst, sharing the information with others and motivating others to participate in the IS continuous re-examination and modification processes (stages F and G of Figure 2.1). The statement made by the centre's resource officer was the best example:

> "Before the programme I was quite reluctant to do the follow-up process for any overdue borrowing or unclear research status. However, after the programme, I became more responsible for checking the database and do the follow-up if necessary. I'm not shy anymore to ask for the research status or information relating to the completed research. Thereafter I'm able to update the database effectively."

The lecturers were also motivated to share their research status or prepare the new research proposal in collaboration with others. In this case, they were not apprehensive to ask the resource centre officer for any specific academic materials. All the lecturers who participated in this research felt that there was a significant improvement in implementing the personal level of their research plan and all of them shared their research information with others, especially with the centre's resource officer. All these enabled the database to obtain new inputs (stages H and I of Figure 2.1). This, in turn, illustrated that the externalised and shared tacit knowledge led to continuous IS development. This type of IS

ultimately provides a good basis for OL due to its continuous update. On the other hand, whenever other staff members experiencing new learning from the database (tacit knowledge development), research participants' tacit knowledge was actually being diffused within the faculty. Therefore, the development of the seven competency sets enabled the development of learning-based systems and, in turn, tacit knowledge diffusion.

From the above discussion it can be learnt that the development of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse assist in developing seven competency sets and, in turn, OL-based IS. This is because they create a basis for effective and continuous IS re-examination and modification processes, thus illustrating that the content of the training module and the research techniques of this pilot case can be adapted to the actual case study of this research.

4.7 The Differences and Similarities between the Theoretical and Practical Work

Yin (2003) noted that differences between the pilot study and actual case study are "more explicitly about the lessons learned for both research designs and field procedures." Similar reasoning was used in this research and as a result, the following discussion about the lessons learned is presented.

The theoretical information provided in Chapter 2 offered a source of knowledge for research, but what was missing from this was the "real life experience" of organisations. Contrasting and comparing the information to the practical experiences, the information was complemented by adding a rich and detailed picture of the practical experiences. This provided a rich setting where the whole spectrum of the issues identified in the earlier chapters can be further explored.

Therefore, this section discusses the differences and similarities between the theoretical and practical work of this research. The differences or similarities are then used to refine the conceptual framework and research techniques of this research. However, before this, a brief description of the lessons learnt from the training programme is offered.

4.7.1 Lessons Learnt from the Training Programme

Several lessons can be learnt from the training programme as cited in the previous sections. First, the training features and activities were able to instil the elements of

understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in the participants' minds. This is based on the empirical results that are discussed in Section 4.6, which in turn highlighted that the developed training module was relevant in developing individuals in this research. This finding enables the impact of the proposed humanistic elements on the seven competency sets, tacit knowledge externalisation and learning-based system to be investigated extensively.

A more important observation from the training programme is that additional issues that would have been difficult to capture in a purely theoretical study were available. Issues such as the organisation's background, practices, culture and working habits would have been missed and, by obtaining such information, training preparation is obtained. Additionally, if a purely theoretical study had been undertaken, then the process of developing questions that require the consideration of the practical experiences would have been foregone.

Finally, the training programme assisted the research in refining the training module. It was also useful in allowing the researcher to develop a training technique that could be used for the subsequent cases. For instance, when the research began, the researcher was aware that the questions to involve participants in the class had to be formed; however, what was not known were the types and content of questions that should be posed and also when to clarify issues. An example of this is that at a very early post-training data collection stage, the researcher asked the participant's level of influencing, sharing and inquiring activities. After the training, it was concluded that a question like this should not be asked at one time. Instead, it should be broken down into parts, and examples and definitions should be provided. This form of questioning was applied to the training programme where improved responses were then obtained.

4.7.2 Lessons Learnt from the Pilot Case Study

This subsection discusses the differences and similarities between the theoretical and practical work of this research. The discussion of the theoretical and practical differences is firstly offered.

In Figure 2.1, it is illustrated that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse can develop meta-abilities, influencing skills and sharing attitudes. However, after undertaking the

training programme it was found that inquisitive tendencies or obtaining clarification from others was important in the workplace. In this case, the respondents argued that staff members cannot know every single piece of information and task in the workplace. Based on this feedback, the researcher revised the training module to include the element of inquisitive tendencies. As a result, the elements of study of this research become seven which are cognitive skills, self-knowledge, emotional resilience, personal drive, influencing skills, sharing attitudes and inquisitive tendencies. Therefore, the term "six competency sets" was changed to "seven competency sets."

This above finding also means that the researcher had to add another proposition, which was: "The relationship between inquisitive tendencies and meta-abilities is expected to be obtainable." Additionally, the conceptual framework that is illustrated in Figure 2.1 requires a change. The descriptions and definitions of the revised conceptual framework are provided in Section 4.8.

A more important observation that can be made by using the case study method regards those additional issues that would have been difficult to capture in a purely theoretical study. During the training programme at the pilot site, as noted above, it was brought to the attention of the researcher that organisational hierarchy, superiority and seniority were the determinants as to whether the influencing, sharing and inquiring activities could be established. Additionally, the participants' negative perceptions towards others demotivated them from gaining ideas from others. This is an issue that is absent from the literature and assisted the researcher in the subsequent case study.

During the data collection stage, an interview was held in the research participants' room. From the interviews, it was highlighted that to set an example, the superiors should create an environment conducive for knowledge sharing in the organisation. For example, the superiors should encourage their subordinates to give ideas or views in order to improve daily operations. By doing this, the subordinates are motivated to share their ideas in a meeting or informal discussion. The research participants commented that, without the superiors' active role, it was difficult to establish a knowledge sharing culture within the organisation. This is something that the researcher highlighted in the next training programme, using relevant business cases. However, the research held the view that this obstacle could be overcome by the value of confidence and a sense of responsibility.

The pilot study also allowed the researcher to revise the interview technique that could be used for the subsequent cases. For instance, when the research began, the interviewer was aware that the questions had to be formed and that the participant should be provided with some time to respond. However, what was not known were the types and content of questions that should be posed and also when to clarify issues. An example of this is that at a very early post-training data collection stage, the researcher asked about the participant's level of meta-abilities, the impact of meta-abilities in influencing, sharing and inquiring activities and the impact of those seven competency sets in tacit knowledge externalisation. After the interview, it was concluded that a question like this should not be asked at one time. Instead, it should be broken down into parts and particularly when asking about the development level of the seven competency sets, examples and definitions should be provided. For example, when asked about the participant's level of self-knowledge, the researcher gave the example of self-knowledge, such as the ability to prioritise tasks and use knowledge flexibly. This form of questioning was applied to the pilot study where improved results were then obtained.

Having highlighted the differences between the theoretical and practical work of this research but not their similarities, the following paragraphs will describe the similarities between the theoretical and practical work of this research.

The first similarity was the development of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse which were central to the idea of meta-abilities development. The development of meta-abilities, in turn, encouraged the participants to fulfil their responsibility in the workplace. This was because working effectively within the organisational reality, which is not logical, controllable or clear, requires abilities such as resilience, good judgement and clear thinking. To instil these, individuals must improve their meta-abilities, which are those personal, acquired abilities that underpin and determine how and when knowledge and skills will be used.

The second similarity was that the development of meta-abilities resulted in the development of influencing skills, sharing attitudes and inquisitive tendencies. These three elements motivated the participants to produce their ideas, actions, reactions and reflections. Additionally, the participants had a motivation to document their ideas and actions which ultimately enabled the centre's resource officer to gain inputs for updating

the database. In this case, it was learned that self-documentation has the potential to update the contents of faculty's research database. Due to the updated contents, the database is capable of disseminating new research information within the faculty. By accessing the updated information, every staff member learned new things about academic research in the faculty. This meant that participants' knowledge of their research activity was able to be diffused within the faculty, through the database.

Finally, it can be concluded that the pilot study was beneficial in that it provided valuable insights into the accumulated knowledge through the background literature review and allowed the research to develop better questions that could contribute to the validation of the conceptual framework. This would have been a difficult and problematic task had it not have been for the pilot study.

4.8 Revising the Conceptual Framework

Reflecting on the above discussion, it can be seen that this research needed to add one more element in the framework, which was inquisitive tendencies. As mentioned above, this issue was highlighted by the research participants during the training programme. The research participants argued that staff members have to undertake tasks according to the accepted procedures. Therefore, any ambiguity in undertaking tasks should be overcome by obtaining additional information from the experts or manager. Based on this feedback, the researcher revised the training module to include the element of inquisitive tendencies.

During the training programme, it was realised that inquisitive tendencies can also become a platform that can allow staff members to externalise and share their tacit knowledge. This was because before obtaining information from others, staff members could think about the types of questions that should be used. This type of thinking resulted in individuals utilising their knowledge actively. In addition, by obtaining new information, staff members could learn new things in the workplace. Therefore, inquisitive tendencies were important for this research conceptual framework.

In relation to the development of inquisitive tendencies, this research believes that the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse allow the development of inquisitive tendencies. As these elements are related to the ability to determine how and when knowledge can be

used, their prospect in developing inquisitive tendencies is reasonable (Barham and Rassam, 1989; Burgoyne, 1988; Schroder, 1989; Morgan, 1989; Drucker, 1992). Therefore, the role of inquisitive tendencies in the externalisation and sharing of tacit knowledge is relevant to this research. The other elements of this research conceptual framework are maintained because they are obtainable in the pilot study of this research. Based on this viewpoint, the new framework is illustrated in Figure 4.1. The descriptions of Figure 4.1 are offered in the following paragraphs.

As mentioned in Chapter 2, individual development is initially fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse (Stage A). All these elements are proposed by Barham and Rassam (1989), Burgoyne (1988), Schroder (1989), Morgan (1989), Drucker (1992), Pedler *et al.* (1994), Goleman (1995), Fitz-Enz (1997), Butcher *et al.* (1997) and Manogran and Liang (1998). The descriptions and definitions of each element are offered in Section 2.5.2. The elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse were selected because they are the underlying learned abilities that play an important role in enabling, and making effective, a wider range of managerial knowledge and skills (Butcher *et al.*, 1997). Being equipped with these elements enables staff members to provide ideas or views (inputs) for a continuous re-examination and modification of IS (Selamat and Choudrie, 2004).

Contrastingly, Stage B demonstrates that the development of the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse is followed by a significant development of meta-abilities (cognitive skills, self-knowledge, emotional resilience and personal drive). This relationship is evident from the findings in sections 4.6.1, 4.6.2, 4.6.3 and 4.6.4. Being equipped with meta-abilities enables staff members to determine how and when knowledge will be practised within the organisation (Butcher *et al.*, 1997). These values have potential to motivate staff members to participate in learning processes and should therefore be considered when developing an effective learning-based systems (Choudrie and Selamat, 2004).

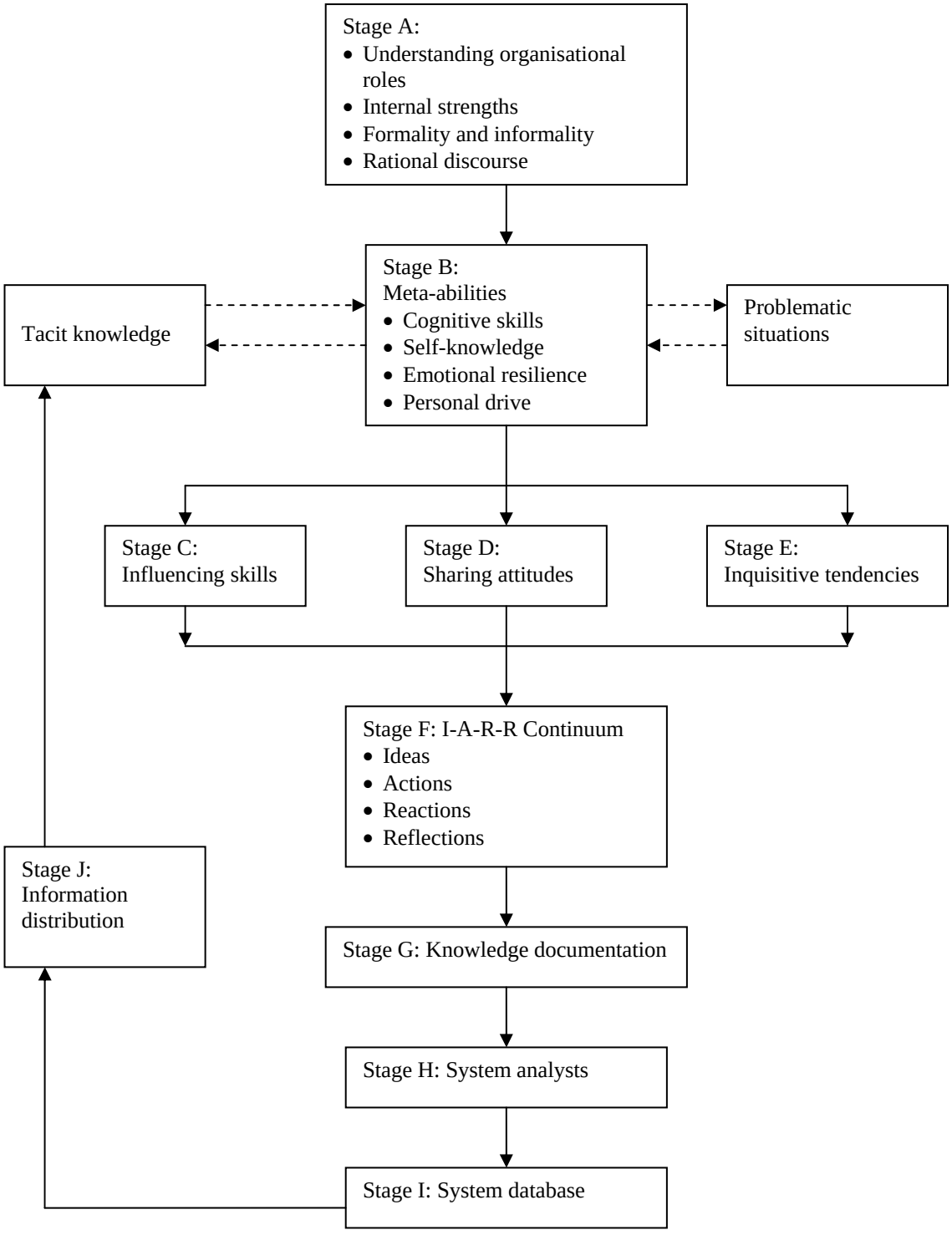

Figure 4.1 Post-Pilot Framework for the learning-based information systems

The findings in Section 4.6.5 illustrate that the development of meta-abilities is followed by a significant development in the influencing skills (Stage C), sharing attitudes (Stage D) and inquisitive tendencies (Stage E). This finding is similar to the finding of Butcher *et al.* (1997) and Harvey and Butcher (1998). In other words, being equipped with

the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse, staff members can face the difficulties in the externalisation and sharing of tacit knowledge and in obtaining information from colleagues, and can consequently become the enablers of tacit knowledge externalisation and sharing. Documenting this externalised and shared tacit knowledge can develop synergistic inputs for continuous IS re-examination and modification (Selamat and Choudrie, 2004).

The findings in Section 4.6.6 demonstrate that improvements in the seven competency sets helped the participants to formulate their ideas, actions and reactions more clearly (Selamat and Choudrie, 2004) (Stage F). This I-A-R-R continuum provides externalised tacit knowledge for OL-based IS development (Choudrie and Selamat, 2004). Additionally, the findings in Section 4.6.6 also demonstrate that to make tangible tacit knowledge, it must be documented first (Huber, 1991; Karhu, 2002) (Stage G). This is achieved through the value of self-documentation, which is also developed by meta-abilities (Butcher *et al.,* 1997; Choudrie and Selamat, 2005). This is because, due to the development of meta-abilities, the willingness to question implicit assumptions, explore new possibilities and direct energies toward higher standards enables the staff members to be well prepared, using good documented progress reports or working papers (ibid). All these self-documented facts in turn provide inputs for IS continuous update. The updated contents property enables the system to disseminate relevant information and ultimately establish a learning process.

The willingness of the resource centre officer to update the database highlights the important role of systems analysts in the learning-based system developmental framework (Stage H). This is also stressed by other authors such as, Huber (1991), Saint-Onge (1996), Haldin-Herrgard (2000) and Laudon and Laudon (2003). At this stage, the resource centre officer study the documented inputs provided by lecturers and codify them. By the time the inputs are transformed into codified domains within the research database, they become information for assisting staff members in doing research. In the diagram, this process is represented by Stage I.

The information in the database can be disseminated within an organisation by using an internet (on the faculty's website) (Stage J). By obtaining new information, a lecturer is able to identify academic materials, to access to new researches, and ultimately

internalising them. At this stage, lecturers can improve their actions through better knowledge and consequently can undertake their tasks effectively – the learning process. Through the learning process, a lecturer's understanding of the research activities (tacit knowledge) is enriched. This new understanding in turn becomes a platform for continuous research database re-examination and modification processes.

Based on Figure 4.1, this research develops another proposition: "The relationship between inquisitive tendencies and meta-abilities could be obtained in practical situations." This is because meta-abilities enable staff members to have a desire to be clear on every undertaken task. Gaining clarity refers to the ability to make sense of this wide range of information, to be able to sort it in a meaningful way, analyse it appropriately and focus on what is most important (Butcher *et al.*, 1997). This value will give staff members an internal strength to ask others, such as colleagues and superiors, questions in order to get "the right solution for the right situation."

The framework for OL presented in this section provides an understanding of the theoretical issues that will be explored in an in-depth case study. The case study is discussed in Chapter 5.

4.9 Summary

The chapter began by describing the process followed by the research in undertaking the pilot study. Thereafter, details of the pilot case were provided. The pilot assisted in refining the training module and interview techniques as well as the questions and, due to some prior reasoning, their results were not used in the data analysis. The pilot case that was used in the investigations was a large academic institution.

The data determined from the literature review were presented to the participants by the researcher in an explicit verbal form. For the post-training part, qualitative data were collated. Consequently, the results were reflected within the research conceptual framework and the discussions are provided in this chapter. The following chapter will draw on the pilot study findings and utilise them to refine the training module and research procedures of the actual case study. This should allow the research to obtain results that will be beneficial in validating the conceptual framework.

5 CHAPTER FIVE: Describing and Discussing the Case Study

5.1 Introduction

This chapter describes and discusses the case study used for the research in this dissertation. The purpose of the case study was: (1) to validate the previously developed conceptual framework provided in Chapter 4 by verifying that the theoretical issues in the chapter are obtainable in practice; (2) to present a conceptual framework that can be used to develop an OL-based IS, specific to Perwaja and generally within LO disciplines and (3) to ultimately present a conceptual framework that can be used to analyse future research studies (the results of which are shown in Chapter 6).

This chapter provides the empirical results of the case study that will be used in the analysis stage. For instance, when questioned about the impact of meta-abilities on organisational tasks, particular research participants provided replies and their statements are stated. However, this chapter does not describe and discuss the analysis of the real case study findings, which are provided in Chapter 6.

5.2 Reasons for Undertaking the Case Study at Perwaja

As mentioned in Chapter 3, an in-depth case study of this research was undertaken at Perwaja, a steel manufacturer in Malaysia. The reason for selecting Perwaja was that there was consent from the management to participate in this research. This consent was important for this type of research as it is longitudinal in nature and involves many research activities. In addition, this research also wanted to examine the proposed humanistic elements in enabling tacit knowledge externalisation and sharing from the industrial perspective. Based on all these arguments, Perwaja was chosen as the case study for this research.

By undertaking research at Perwaja, the conceptual framework of this research could be investigated from the industrial perspective. Therefore, the findings of this research would be beneficial to the industry as well. It is widely agreed that people in organisations have knowledge or talent (Butcher *et al.*, 1997). However, just obtaining specific skills is no guarantee that the skills will be used appropriately (ibid). There are many factors preventing individuals from using their knowledge and skills – lack of confidence, unwillingness, being carried away by strong feelings and other distractions (Harvey and Butcher, 1998). These inhibit a learning capability and deter individuals from recognising when new skills are to be learnt. This research intends to propose a solution to this issue by proposing the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse.

Whilst this section discussed the reasons for undertaking a case study in Perwaja, the next section will offer descriptions about the way the case study was undertaken.

5.3 Undertaking the Case Study

After completing the pilot case, the researcher began the case study. The first stage of the case study, as mentioned in Chapter 3, was understanding the operational background of Perwaja. In the meantime, the researcher revised the training module, presentation slides and programme outline. The revision was undertaken by referring to the inputs that were obtained from the pilot study and Perwaja's operational background. The training approaches and research techniques were also revised based on the inputs from the pilot study.

After completing the process of understanding Perwaja's operational background and revising the training materials, training approaches and research techniques, the training programme was commenced. The following sections will describe the empirical findings of this case study. The findings are then analysed in Chapter 6. Therefore, Section 5.4 intends to describe the empirical results that will become a basis for the analysis stage (the results of which are shown in Chapter 6).

5.4 Describing the Case Study

As mentioned in Chapter 3, the case study of this research is Perwaja. Perwaja is a large Malaysian steel company. It has two plants, Kemaman and Gurun. Perwaja's headquarters are located in Kuala Lumpur.

The Kemaman plant is over 400 acres on the East coast of Malaysia, which is known as the "heavy steelmaking area" within Malaysia. Its location on the East coast fulfilled many important criteria. First, there is an abundance of natural gas from Terengganu's (one of the states in Malaysia) offshore gas fields. Second, it is very close to a constant electrical supply. Finally, the proposed site is situated next to the coastline which could be developed into a deep water port where large ships and vessels could dock in order to unload iron ores brought in from other countries, such as Chile, Brazil, Sweden and the Middle East.

The Kemaman plant began operating in 1985. The plant has an electric arc furnace (EAF), ladle furnaces and casting machines to melt down raw materials and cast molten steel into mild steel, high tensile steel, low carbon and high tensile vanadium billets. Annual total production capacity of this plant is over 1,000,000 metric tonnes of billets and will increase still further. The Kemaman plant also has a direct reduction (DR) plant that is utilised to produce direct reduced iron (DRI). In 2002, Perwaja produced over 4.9 million metric tonnes of DRI. The DRI is screened before it is sent to the meltshop for use. At the meltshop, scrap is inserted into an EAF. It is then melted to form a molten pool. DRI is then top fed into the molten steel. This melting process ultimately produces a billet strand. The billet strand is cut by an oxygen torch to a customer's specifications. Thereafter, the billets are transported by land to the Gurun plant.

The Gurun plant is one of the largest steel mills in South East Asia. It is situated in a massive industrial park of 650 acres. This plant is the place where high quality finished

products, such as wire rods, bars and sections are produced from the steel billets and blooms cast at the Kemaman plant. It is a highly integrated centre with a ready supply of raw materials for the manufacturing of steel-related products, such as autoparts manufacturing, annealing, heat treatment and forging.

The existence of the section mill in Gurun, the upgraded meltshop at Kemaman and the facilities to produce flat products enable Perwaja to be a fully integrated steel mill production. This means that, not only are the upstream products of billets and blooms manufactured in these locations, but so are the downstream products – with a wide range of special quality wire rods, bars and medium to large sections. This in turn enables Perwaja to be the Malaysian primary producer of steel billets and products. This production capacity and its management personnel, which have taken innovative and pragmatic strategies to produce high quality, value-added steel products for the automotive, engineering and construction industries, have led to its current success.

The headquarters in Kuala Lumpur supervise the overall operations and administrations of Perwaja. This is undertaken by utilising a fully integrated, sophisticated in-house IS, which consists of several modules. Examples of the modules include maintenance management, accounting and finance, quality management, multiple-level production and human resource systems. Due to its complexity, studying the whole system was beyond the researcher's capability and time constraints. Therefore, the research decided to focus on the maintenance management system. This was because the maintenance management system involves active interactions between the users and the system in order to ensure its effectiveness and efficiency. This characteristic is compatible with the nature of this research, which is to study the relationship between human beings and IT. The descriptions of the maintenance management system are offered in the following subsection.

5.4.1 Centralised Maintenance Management Systems

As a manufacturing company, one of Perwaja's main activities is to establish an effective and efficient maintenance operation. The maintenance operations in the Kemaman plant are undertaken by six different departments: (1) instrumentation; (2) mechanical services; (3) water; (4) electrical; (5) crane and (6) maintenance planning. Gurun plant, on the other hand, has two maintenance departments: (1) maintenance

solutions; and (2) utilities. The Kemaman and Gurun maintenance departments also involve external jobs, with businesses such as Petroleum Nasional Bhd (Petronas) and Tenaga Nasional Bhd (TNB).[2] Due to the increasing utilisation of the machinery, any delays in repairing machinery breakdown affects the production and, consequently, steel delivery. This problem then causes penalties to be imposed by the client and the reputation of the company becomes tarnished. Reputation is pertinent to the organisation, especially amongst overseas clients.

To assist in managing its maintenance activity, Perwaja developed a Centralised Maintenance Management System (CMMS). Instead of recording and processing the maintenance data, CMMS was also utilised to perform maintenance planning. Therefore, in every maintenance department, there is a systems officer who is in charge of CMMS and who is accountable to the IS department. CMMS is also connected to the Electronic Quality Management System (eQMS), which ensures that all the maintenance jobs are undertaken according to the Malaysian and international industrial standards. Both systems are maintained by the IS department. Overall, there are more than 2000 people employed in the plants and the IS department.

An interview with the management sector personnel of the organisation revealed that there was an existing problem between the production, maintenance and materials departments. The production department blamed the maintenance department for any delays in production, with reasons such as machine breakdown or ineffective maintenance operations. Contrastingly, the maintenance department's members attributed delays to the materials management that subsequently caused the unavailability of spare parts. The materials department, as predicted, blamed the vendor, as well as last minute orders received from the maintenance department, for its incapability to provide the spare parts. Such instances have resulted in creating disruption in the plant's operation. From the analysis, it was found that the main factor that contributed to such problems was the lack of a sense of responsibility amongst the staff members to communicate effectively, specifically during the decision making process.

After interviewing the management sector personnel and identifying the causes of such problems, an interview was held with the Human Resources Director. During the

[2] Petroleum Nasional Bhd is a Malaysian national petroleum and gas company and Tenaga Nasional Bhd is a Malaysian national electricity company.

meeting, the normative concept of understanding organisational roles, internal strengths, formal and informal discussions, rational discourse and the seven competency sets was shared and described. The Human Resources director also emphasised the importance of meta-abilities and tacit knowledge sharing and externalisation. The impact of that process for organisational development was also highlighted. After the meeting, the director agreed to participate in this research programme. After considering the researcher's proposal, the Human Resources Director then selected the participants of this research.

5.4.2 Undertaking the Training Programme in the Case Study

The case study training material was the same as the pilot because both stressed on the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. The summary of the training module is given in Appendix E. The training material of the pilot was changed in the case study from the following two aspects: (1) the cases that were discussed during the training programme which were based on the practical situations of the maintenance operations in the steel plant; and (2) the refinement of the presentation slides and the structure and grammar of the module. These changes were undertaken to smooth the flows of the presentation so that the participants can understand the lecture easily.

As in the instance of the pilot case, the training programme was underpinned by the elements of understanding organisational roles, internal strengths, formality and informality in discussion and rational discourse. The aim of instilling these elements was to develop the seven competency sets, which were: (1) influencing skills; (2) sharing attitudes; (3) inquisitive tendencies; (4) cognitive skills; (5) self-knowledge; (6) emotional resilience and (7) personal drive. This strategy was similar to the strategy that was adopted in the pilot case. In short, the material concern with developing individuals' motivation and willingness to externalise and share their tacit knowledge effectively. It is suggested that being equipped with these elements enables staff members to provide ideas or views (inputs) for a continuous re-examination and modification of IS (Selamat and Choudrie, 2004). Being continuously updated, it is argued that the systems can promote learning because staff members can gain new insights in performing tasks (ibid). This is due to the current information or contents that the system has. This relationship, in turn, could answer the research questions of this research that are as follows: "How do we include individuals

in the learning-based systems development? Why use meta-abilities in order to include individuals in the learning-based systems development?"

The training programme in Gurun was undertaken in the golf resort's conference hall. Kemaman's programme was undertaken at the beach resort. The two locations were at locations different to the usual working area and research site. This was considered beneficial, since this strategy enabled the research participants to concentrate on the programme. The programme incorporated a variety of features and activities to enhance the learning experience and maximise the personal benefits. These included: (1) interactive lectures; (2) syndicate group work; (3) work on live business and IS issues, (4) profiling questionnaires; (5) case studies; (6) one-to-one tutorials or coaching; (7) individual work and (8) a one-day follow up. As noted above, the post-pilot training materials were utilised during the training programme in Perwaja.

On the final day of the programme, the research participants constructed a comprehensive 60 day action plan that contained personal development and organisational change issues. This formed the basis of the progress review. For the progress review, the researcher met the participants again in order to further develop the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse by discussing their achievement on the targeted actions. Any problems that arose during the developmental period were discussed and tackled at a face-to-face meeting. This meeting was held in the research participant's room. One month after the progress review session, the data collection commenced.

5.4.3 Evaluating the Effectiveness of the Training Programme

Before discussing the findings of the case study, the evaluation of the training programme was dealt with. From the information on the programme evaluation form, it was found that the effectiveness of the training programme was at a satisfactory level and related to the relative effectiveness for the specific appraisal issues. For each of the 13 issues, an average "effect of the programme" rating was calculated using a scale of 1 to 5 (where 5 = excellent and 1 = unacceptable). The reason for using a 5-point scale is offered in Section 3.4.4.

As illustrated in Table 5.1, the 13 issues were then arranged in descending order. This is to assist the researcher in determining the area that requires an improvement in the

future research programme. This also recorded the number of responses in categories 1, 2, 4 and 5. These four categories were utilised as they represented extreme positions in the evaluation process. Categories 1 and 2 represented the unsatisfactory levels, whereas categories 4 and 5 represented the satisfactory levels. Category 3 was excluded since it represented a neutral point of view in the evaluation process. From Table 5.1, it can be seen that the rating trends clearly indicated that the training programme was effective, which indicated a high degree of understanding and appreciation of the seven competency sets amongst the participants.

Table 5.1 The effectiveness of the meta-abilities training programme

Appraisal Issue	Average	1 and 2	4 and 5
The benefit of this lecture	4.38	-	32
The instructor's answered questions	4.33	-	36
The instructor's manners and professionalism	4.31	-	31
Delivery of the lecture by the instructor	4.08	-	29
The instructor's communication	4.08	-	31
The clarity of the lecture	4.05	-	30
The level of concentration during the lecture	3.95	-	24
The presentation of this lecture	3.95	-	27
The level of formality for this lecture	3.90	-	28
The information in the lecture	3.87	-	25
The instructor's appearance	3.77	-	21
The level of understanding in this lecture	3.59	-	20
The ability to ask questions	3.44	-	16

Having discussed the effectiveness of the training programme but not its impact on the participants, the following sections will describe the empirical results of the case study and relate them to the structure of the framework in Figure 4.1. The empirical results also further substantiate the effectiveness of the training programme in instilling the elements of understanding organisational roles, internal strengths, formal and informal discussions, and rational discourse amongst research participants.

5.5 Findings of Case Study

From the aforementioned discussions, the researcher wanted to investigate whether the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse can develop meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies in the research participants' mindsets. In addition, the researcher wanted to investigate the impact of meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies on tacit knowledge externalisation and OL-based IS

development. The answers for these research questions are offered in the following subsections.

5.5.1 Meta-Abilities: Cognitive Skills

To obtain the feedback on the development of cognitive skills from the research participants, the following question was asked during the interview session: "What is the impact of the programme on the development of cognitive skills?" The research participants described changes related to the development of cognitive skills. For example:

> "This programme was really beneficial from my point of view. This is because I am not rushing to complete my tasks anymore. Instead, I will take time to think about the problem, discuss with colleagues or managers and eventually implement the decision."
>
> Mr. Anuar

> "This programme increased my confidence in communicating with my subordinates or superiors. I set in my mind that everything that I did was my duty and therefore it is my responsibility to accomplish it for the sake of Perwaja. I should not become arrogant, annoyed and sensitive to any instruction if it has been agreed in the meeting or is beneficial to my staff and company."
>
> Mr. Abdul Rahim

Mr. Anuar and Mr. Abdul Rahim highlighted the ability to notice and interpret what is happening in interpersonal situations. In this case, they mention the importance of their relationship with superiors, colleagues and subordinates in the workplace. The ability to notice and interpret what is happening in interpersonal situations allowed Mr. Anuar and Mr. Abdul Rahim to read situations, understand and resolve problems effectively (Butcher *et al.*, 1997). Therefore, it can be learnt that the training programme had successfully developed the cognitive skills of Mr. Anuar and Mr. Abdul Rahim.

The training programme had also successfully developed the ability to entertain multiple perspectives and integrate them in the workplace amongst the participants. For example:

> "The course gave me guidance on how to build a good relationship with others in Perwaja. Before this, when I faced a problem, I always looked to other departments from the negative side, such as they try to blame or degrade my department and others. But after the

> course, I had a positive outlook on them and a willingness to collectively solve the problem."
>
> Mr. Mohd Rahmat

> "I utilise different languages for different types of people. For example, when dealing with top people, I tend to utilise a direct meaning language rather than a double meaning language. This is to escape from misunderstanding issues when dealing with them. For the subordinates or colleagues, I might use jokes, unserious or informal language. In short, I will ensure that the correct language is used at the correct people and time."
>
> Mr. Md Isa

From the above statements, it can be seen that Mr. Mohd Rahmat and Mr. Md Isa were flexible when dealing with others. This could enable them to effectively determine the cause and effect of their actions in the workplace – cognitive flexibility. This ability, in turn, develops their cognitive skills (Butcher *et al.*, 1997).

Additionally, the research participants also highlighted the ability to envision strategic futures. For example:

> "Before the attendance on the programme, I was unsure of how to solve a problem effectively. After the course, I could see the systematic flows in the decision making process in the organisation. The element that assisted me in this was the ability to communicate with my staff or colleagues. By communicating with others, I could know the problem in detail and discuss its solution in a collective manner."
>
> Mr. Mohd Adi

> "Before the course, I did not know how to solve a problem in an effective manner. After the course, my mind was concerned with the planning for the unit and the approach to integrating all members in the decision making process such as through discussion, face-to-face meeting, dialogue and meeting with the senior management. The meeting discussed the problems, their causes and the actions to solve them. In other words, the course gave me a smooth guidance on how to tackle problematic situations effectively and efficiently."
>
> Mr. Norazlan

From the above statements, Mr. Mohd Adi and Mr. Norazlan highlighted the ability to envision their strategic actions in the workplace. These skills allowed them to determine the actions that they can consider when facing difficulties in the workplace – perceptual acuity. Based on the argument of Butcher *et al.* (1997), this ability is related to the

development of cognitive skills. Therefore, it can be learnt that the training programme had successfully developed the research participants' cognitive skills.

The research participants also gained the ability to sort and analyse data from the attendance on the training programme. For example:

> "The programme discussed the best procedures that should be followed in problem solving and instilled virtuous values for the effective works. After the course, I became clearer on my scope of work, obtained ability to prioritise information and tasks and managed to handle tasks better than before."
>
> Mr. Mohd Zulmahri

> "This programme was great. It increased my knowledge and skills in managing my work effectively. In addition, it broadened my scope of thinking and improved my communication skills. I became more open-minded in dealing with my staff and daily work."
>
> Mr. Fakhrurazi

From the above statements it can be seen that Mr. Mohd Zulmahri and Mr. Fakhrurazi experienced a profound development of the ability to sort and analyse data in the workplace – gaining clarity. This ability allowed them to "read situations, understand, and resolve problems" effectively (Butcher *et al.*, 1997). In other words, Mr. Mohd Zulmahri and Mr. Fakhrurazi experienced a profound development of cognitive skills.

From the above statements, the research participants highlighted the ability to notice and interpret what is happening in interpersonal situations, to entertain multiple perspectives and integrate them, to envision strategic futures and to sort and analyse data. These skills allow organisational members to read situations, understand and resolve problems (Butcher *et al.*, 1997). All these abilities, in turn, develop an individual's cognitive skills (ibid). Therefore, it can be learnt that the training programme had successfully developed the research participants' cognitive skills.

5.5.2 Meta-Abilities: Self-Knowledge

To investigate the level of self-knowledge experienced by the research participants, the following question was asked during the interview session: "What is the level of self-knowledge after the programme?" The overall findings showed that the research

participants described increased self-knowledge as an outcome of the training programme. For example:

> "Frankly speaking, before this I didn't know how to solve problems wisely. However, by practising the elements of the programme, I gained a lot of improvement. I am able to communicate with my staff in a friendly situation and solve problems in a collective manner. My current strength is the confidence to solve problems through formal or informal discussions. I am not brave for fighting but for having a discussion. I am confident that I can do it."
>
> Mr. Abdul Rahim

> "I feel that this programme has instilled virtuous working values in the participants. This is because I can differentiate between the important work and the less important work, the task that should be completed first or postponed, and others in the workplace. The contents of the course can be implemented in any situation and by any people."
>
> Mr. Mohd Wahyudi

From the above statements, Mr. Abdul Rahim and Mr. Mohd Wahyudi highlighted the ability to judge about how to approach different situations by helping them to distinguish between their personal needs, the needs of the situation and of other people. This could enable them to determine how to change their approach or even push them into action when they could have otherwise done nothing. All these abilities, in turn, develop an individual's self-knowledge (Butcher *et al.*, 1997).

The research participants also highlighted the ability to value critical self-examination, to continue to evaluate themselves back at work in order to maintain a current picture of their strengths and weaknesses. It helped them value and use the skills of their staff and colleagues in more complementary ways:

> "The programme made me more concerned with daily tasks and implemented them according to their priority and after undertaking meticulous evaluation. It made me aware that if we make mistake, the company will have to bear the risks and therefore make us feel guilty to do it."
>
> Mr. Ishak

> "Another important impact of the programme on me is that I became more open with my colleagues. I am aware that everybody has their own expertise and characteristics. I will utilise these expertises and characteristics for the sake of the company through the medium

> of discussion. If my staff have problems, I will ask them personally and assist in overcoming the problems. I always reminded them that personal stuff cannot be mixed up with working stuff."
>
> Mr. Mohd Azmi

From the above statements it can be seen that Mr. Ishak and Mr. Mohd Azmi experienced a profound development of the ability to consider a range of options in their own behaviour and to make better judgements of what to do. They allowed other skills and knowledge to be used more flexibly (Butcher *et al.*, 1997). In other words, the research participants experienced a profound development of self-knowledge.

Additionally, the research participants also highlighted the ability to understand their own reactions and find alternative approaches, which help them remain effective. For example:

> "By attending the programme, I now have a better understanding about myself and my work. Being equipped with this knowledge, I now have the ability to understand the impact of my actions on others, the people that I need to refer to and the priority of every task. All these are determined in the discussion with boss or colleagues."
>
> Ms. Susi

> "After the programme, I was able to control my temper. I forced myself to listen to what other people said first and then acted accordingly. I will only open my mouth after they finished their conversation. If I think the view is not so realistic, I will give my idea. But the idea is still open for discussion. I will always control my voice of speech in dealing with these scenarios."
>
> Mr. Azahari

From the above statements it can be seen that Ms. Susi and Mr. Azahari experienced a profound development of the ability to understand their own reactions and find alternative approaches. The ability to react to pressure was considered important because organisational life creates many stressful situations for the research participants. This ability also allowed Ms. Susi and Mr. Azahari the personal robustness to use knowledge and skills more flexibly (Butcher *et al.*, 1997). In other words, the research participants experienced a profound development of self-knowledge.

Self-knowledge also included being clear about personal goals (Butcher *et al.*, 1997). From the following statements it can be seen that the research participants experienced a profound development of the ability to determine their personal goals in the workplace. In other words, the research participants experienced a profound development of self-knowledge. For example:

> "The programme helped me to understand my personal aims and objectives. This is really helpful in making sure that I do not fall into unsystematic job implementation, such as unavailability of equipments, spare parts and others. In addition, all tasks should be completed on specified time. I can imagine the feeling of doing work in the darkness."
>
> Mr. Zakaria

> "From the course, I realised the importance of trust in the workplace. Behind every single cent that is received from the company is a responsibility that must be fulfilled. In addition, I realised that work planning is critical in the process of achieving an effective task implementation. Therefore, after the course I made up my mind to know future tasks at the beginning stage so that their implementation would be much easier and more organised."
>
> Mr. Mohd Yazi

From the above statements it can be seen that the research participants were able to view themselves through another's eyes, know one's own motivations and values, and distinguishing one's own needs from those of others. These skills allowed organisational members to consider a range of options in their own behaviour and to make better judgements of what to do (Butcher *et al.*, 1997). They also allowed other skills and knowledge to be used more flexibly (ibid). All these skills illustrate a significant development of self-knowledge amongst the research participants. Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing self-knowledge in this research.

5.5.3 Meta-Abilities: Emotional Resilience

To examine the level of emotional resilience experienced by the research participants, the following question was asked during the interview session: "How about the impact of the programme on emotional resilience?" From this, the research participants described increases in emotional resilience as a result of the training programme. For some, the focus was on self-discipline:

> "The course improved my internal strength to work hard in the company. In this case, I look at the trust perspective. The company entrusted me with the critical jobs. Therefore, it is my responsibility to observe and fulfil the given trusts. This course enabled me to be patient and steadfast in facing the difficulties in the workplace, especially the human-related difficulties. In addition, it improved my motivation to do my best in the company. Through all these values, I am sure that the opportunity to develop my career is widely opened in the company."
>
> Mr. Norazlan

> "With the support of the family, boss and friends, I was able to do my work in a determined way. In other words, I was able to focus on my work and put aside all distractions. The course has strengthened this value in my heart. I would not give up in anything that I do in the future. Instead, I will improve the performance of my unit and achieve the best for the company. All these factors will also improve my personal development."
>
> Mr. Zainol

From the above statements it can be seen that Mr. Norazlan and Mr. Zainol experienced a profound development of self-control and discipline. These skills allowed organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). In other words, Mr. Norazlan and Mr. Zainol experienced a profound development of emotional resilience. In turn, this development illustrated that the training programme had successfully developed the research participants' emotional resilience.

For other research participants, the impact was on how they managed their feelings. Feelings, when appropriately managed, are an important part of engaging other people, energising situations and taking action (Butcher *et al.*, 1997). "Appropriate management" was, in some cases, a matter of reducing the volatility and dominance of emotion in behaviour while, in other cases it was more about learning to express feelings rather than suppressing them (ibid):

> "This programme has made me more mature in terms of my feelings and thoughts. I became good at staying calm in difficult situations, especially when it is related to the interrelationship between staff in the department. Sometimes it really hurts but after a few days it just disappears. To dissipate the hard feeling, I continue to keep in touch with them. The programme has made me stronger in facing all these scenarios."

Mr. Azize

"I admit this. Normally, when I supervise a long term project, the existence of tension is widespread. But I now reduce the tension through good communication. In addition, I am now able to control my anger when undertaking tasks. I undertake tasks happily with my staff, despite the existence of tiredness. I always greet my staff and ask if they face any problems, etc. If it is within my capability, I will lend a hand in sorting out problems. The motive for all these strategies is to eliminate hatred among staff and colleagues."

Mr. Kamal

"Yes it is. I am a bad tempered guy. I will give an instruction in a direct manner, without a friendly smile or joke. This scenario may be due to the army training that I gained at university. But after the course, I was able to control my temper. I could feel the change in my action or approach. In addition, I was able to deal with my colleagues or staff."

Mr. Shaarin

The aforementioned empirical results demonstrate a significant development of the Mr. Azize, Mr. Kamal and Mr. Shaarins' ability to use emotion well to cope with pressure and adversity. In this case, they became more patient when facing difficult situations in the workplace. In short, this ability develops their emotional resilience (Butcher *et al.*, 1997). Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing emotional resilience in this research.

Many research participants also described being able to remain objective and self-disciplined under pressure as a result of the training programme. For example:

"Yes it did. The top management requires that the entire breakdown should be settled within two to three hours. But the operational workers like me think that this is impossible. The top people keep calling us every 7 – 15 minutes to check the progress of the maintenance works. This situation puts pressure on me. However, I will not express this pressure to my staff, so that they can concentrate on their work. So I just keep it in my heart and concentrate on my work. The course gave me a valuable tip on facing and handling this situation effectively."

Mr. Mohd Syafawi

"Sometimes my staff and colleagues told me that "why do you work so hard when you know that there will be no salary increment?" My response was that the type of thinking should be changed because the most important thing in the workplace is fulfilling our

> responsibility to the company. The course gave me strength to explain this to my staff and colleagues. My main point was that we should perform work sincerely. Normally this explanation would take place in the daily morning meeting."
>
> Mr. Zainizam

> "This course increased my internal strength to face all the difficult, sad and hurt moments in the workplace. All these are normal things in an organisation. I was not annoyed when my staff disobeyed me or performed badly. Instead, I just gave advice and views to reconcile the situations and asked them to contemplate them at home. I also asked them to come and see me again to explain the impact of my advice, if they had free time later on."
>
> Mr. Mazalan

From the above statements it can be seen that Mr. Syafawi, Mr. Zainizam and Mr. Mazalan experienced a profound development of the ability to remain objective and balance feelings about oneself. These skills allowed them the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). In other words, they experienced a profound development of emotional resilience. In turn, this development illustrated that the training programme had successfully developed the research participants' emotional resilience.

By far the most dominant theme in responses about emotional resilience concerned personal confidence. Research participants felt a great deal more confident as a result of the training programme. For example:

> "Yes of course. This course has increased my internal strength to face everything in the workplace and improve my communication skills. I always work under pressure because my boss keeps giving me tasks, although I am still not finished with the current one. But I managed to control myself, do the high priority one and no compromise on work quality."
>
> Mr. Mohd Wahyudi

> "Yes, of course. This course taught me to dare to receive complaints and objections from colleagues. In this case, I should be confident to face all these phenomena."
>
> Mr. Zulkipli

The aforementioned empirical results demonstrate a significant development of the Mr. Mohd Wahyudi and Mr. Zulkiplis' ability to face and deal with difficult situations more effectively and to be more able to apply their skills and knowledge at these times. This could enable them to effectively control their actions in the workplace. This ability, in

turn, is related to the development of an individual's emotional resilience (Butcher *et al.*, 1997). Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing emotional resilience in this research.

From the above statements it can be seen that the research participants experienced a profound development of self-control and discipline, the ability to use emotion well to cope with pressure and adversity and balance feelings about oneself. These skills allowed organisational members the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). In other words, the research participants experienced a profound development of emotional resilience. In turn, this development illustrated that the training programme had successfully developed the research participants' emotional resilience.

5.5.4 Meta-Abilities: Personal Drive

To obtain the feedback on the development of personal drive from the research participants, the following question was asked during the interview session: "What is the impact of the programme on the development of personal drive?" From this, the research participants described increases in personal drive as a result of the training programme. For example:

> "Good! I can see many changes in myself which enable me to deal smoothly with others. I can being confident in expressing ideas or give opinions. I am equipped with abilities to solve problems by using right and systematic approaches and also without creating conflicts with others. Overall, everything is really excellent."
>
> Mr. Rosli

> "The impacts of the programme are various. The most significant one in myself is that I became more effective and committed in work and also became more responsible in everything I do. I managed to organise my self and my tasks more systematically and according to the company's procedure, and also to view a problem from a wider perspective."
>
> Mr. Samsulisam

> "I am more concerned with my work planning and its implementation to ensure everything runs smoothly. This is because the programme changed my attitude of complacency into

> the desire for excellence. Therefore, I am able to coordinate work effectively through organised planning and self-discipline."
>
> Mr. Mohd Syukri

From the above statements it can be learnt that Mr.Rosli, Mr. Samsulisam and Mr. Mohd Syukri experienced a significant development of self-motivation and determination and a willingness to take responsibility and risks. These values helped them to persist, motivate others and meet targets (Butcher *et al.*, 1997). In other words, they experienced a significant development of personal drive. This development illustrated that the training programme had successfully developed the research participants' personal drive.

To recapitulate, the aforementioned empirical results demonstrate a significant development of meta-abilities (cognitive skills, self-knowledge, emotional resilience and personal drive). This showed that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing meta-abilities. From these findings, it can be said that the foundation of this research, conceptual framework, has been successfully established (stages A and B of Figure 4.1). This, in turn, justified the relevancy of those elements in developing meta-abilities in this research. The following subsections will discuss the impact of meta-abilities on tacit knowledge externalisation and sharing and, in turn, OL-based IS development.

5.5.5 Influencing Skills, Sharing Attitudes and Inquisitive Tendencies

After being questioned about the post-training meta-abilities, the respondents were asked about their impact on the post-training influencing skills, sharing attitudes and inquisitive tendencies. Questions included: "What can you say about the level of influencing skills after the programme? How do meta-abilities assist you in improving influencing skills? Do you experience an improvement in the sharing attitudes after the programme? What is the role of meta-abilities in improving your sharing attitudes? How about the level of inquisitive tendencies after the programme? Do meta-abilities play an important role in developing your inquisitive tendencies?" The research participants described increases in the influencing skills as a result of the programme. For example:

> "After the course, I was able to improve my influencing skills. I lead one team in my department and I want it to be the best. To achieve this goal, every unit member should

appreciate it also. Before this, teamwork in my unit was not so good. After the programme, I started playing an important role in instilling this understanding amongst my staff. All the problems will be settled in the meeting. Thank God, it was a most fruitful strategy. Everybody has started to work together now."

Mr. Azize

"The main thing I learnt from the course was the importance of having a good relationship between staff members. Before this, I was sceptical about doing a job together and communicating with others. Maybe they have political reasons for doing such things. However, I managed to gradually overcome this feeling."

Mr. Hazis

"The most important things that I learnt from this course were communication skills. With these skills, I was able to solve a problem rationally and control emotions during the meeting. If I have a problem, I will express it and there is no need to blame anyone else. So with this skill and plus rational discourse, I was able to solve the problem effectively."

Mr. Mohd Wahyudi

From the above statements it can be learnt that Mr. Azize, Mr. Hazis and Mr. Mohd Wahyudi experienced a significant development of communication skills and a willingness to persuade others. These values helped them to effectively utilise knowledge and skills in order to influence others in the organisation. In other words, they experienced a significant development of influencing skills (Butcher *et al.*, 1997). This development illustrated that the training programme had successfully developed the research participants' influencing skills.

As well as this, the research participants significantly commented on the development of sharing attitudes. For example:

"On returning from the programme, I felt that all the staff members were like one big family. It is my responsibility to help others, share the information that I possess and establish a good relationship with others."

Mohamed Ridzuan

"The programme not only developed myself but also my unit members. After the programme, I had the strength to explain the right way in undertaking the designated jobs to all my staff. Before this, they just followed their gut feeling in undertaking tasks, which

> normally ended with a low level of quality. At the moment, the situation is improving day by day."
>
> Mr. Ishak

> "It was clear in the meeting that I felt confident enough to explain everything that needs to be undertaken during the maintenance operations. I explained every single step that should be undertaken to improve the previous weaknesses. So advanced planning is really important in work improvement process."
>
> Ms. Herlina

From the above statements, Mr. Mohamed Ridzuan, Mr. Ishak and Ms. Herlina highlighted the ability to inform others about the need for changes or improvement. This ability helped them to explain everything that needs to be undertaken during the operations to others. All these abilities, in turn, develop their sharing attitudes (Selamat and Choudrie, 2004). This development illustrated that the training programme had successfully developed the research participants' sharing attitudes.

With regards to the inquisitive tendencies, the research participants indicated improvement as a result of the programme. For example:

> "From an active communication programme that I promoted in my unit after the programme, my staff were not hesitant to meet me for any technical or non-technical assistance. I tried my best to assist them and, if I thought that it was not under my expertise, I referred them to the right person, but still under my supervision. So... yeah... through asking activities, the work could be undertaken smoothly. Furthermore, we should learn from many experts, not only ones specific to the nature of the problem."
>
> Mr. Zaini

> "The course has changed my behaviour from timid to friendly. Before this I was not very sociable. After delegating the tasks to my subordinates, I would concentrate on my own work. But after the course I always met my subordinates to ask about work progress, problems and internal feeling due to heavy work burdens. In addition, I became confident in facing my colleagues in the meeting and expressed my views if necessary."
>
> Mr. Abdul Rahim

> "I was involved in many projects including the external projects. As a result, I needed to understand and catch up with so many things in one time. This is due to the different projects requiring different technical understanding. So the best way to face it is by asking

the experts. The programme assisted me in this by providing the techniques to understand other staff members and the working environment."

Mr. Yumas

The aforementioned empirical results demonstrate a significant development of the Mr. Zaini, Mr. Abdul Rahim and Mr. Yumass' ability to ask others more effectively. This ability helped them to undertake tasks according to the accepted procedures. In other words, they experienced a profound development of inquisitive tendencies (Butcher *et al.*, 1997). Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing inquisitive tendencies in this research.

From the aforementioned discussions it is clear that significant development of meta-abilities (as mentioned above) is followed by a significant development of influencing skills, sharing attitudes and inquisitive tendencies. These findings illustrate that stages A, B, C, D and E of the research conceptual framework (as illustrated in Figure 4.1) has been achieved. In other words, the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse had successfully developed meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies in the research participants' mindsets. This justified the integration of the seven competency sets that are proposed by this research. As a result, a relevant platform to examine the feasibility of the conceptual framework in a real life setting is obtained. However, a process to analyse the platform in order to validate the conceptual framework will be undertaken in Chapter 6.

At this point, the impact of the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse on the development of meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies have been discussed. However, the externalisation of tacit knowledge has not yet been covered and so the next subsection will describe the externalisation of tacit knowledge through the medium of ideas, actions, reactions and reflections.

5.5.6 Externalised Tacit Knowledge: Ideas, Actions, Reactions and Reflections

Having described the first level of development, the second level of development of this research has been triggered, which asks the question: "What did this development allow individuals to do with their tacit knowledge?"

As mentioned in Chapter 2, the developments in the seven competency sets, as noted above, could be linked to improvements in tacit knowledge externalisation and sharing. In this case, improvements in influencing skills, sharing attitudes and inquisitive tendencies should allow the research participants to formulate their ideas, actions, reactions and reflections.

To examine the level of tacit knowledge externalisation and sharing (ideas, actions, reactions and reflections) experienced by the research participants, a second conversation was undertaken four weeks after the first conversation. The rationale of this approach is offered in Section 3.5. The responses from the participants are illustrated in the following paragraphs.

One of the greatest issues of concern was improving the research participants' ability to externalise their ideas. However, the following examples offer an overview of the improvements described by the research participants:

> "After the programme, expressing ideas has become a norm in my daily activities. However, I will also encourage others to do the same. If the ideas come from one source only, it is risky, because every idea has its weakness. So, before making a decision, I will listen to and understand other people's ideas so that a comparison could be made. This strategy is much safer than relying on one source of ideas."
>
> Mr. Nordin

> "By asking and sharing, it was admitted that the ideas' expressions were quite common in my department. Because of the persons who attended the programme, the meeting became alive and active."
>
> Mr. Zainol

> "By influencing, sharing and asking, I was able to get feedback from my colleagues for the sake of work improvements. Although I know exactly how to do it, by practising such things indirectly I was able to create synergy in my unit because everyone contributes to ideas in order to achieve unit's goals."

Mr. Tg Mahathir

Mr. Nordin, Mr. Zainol and Mr. Tg Mahathir highlighted the ability to externalise ideas. In this case, they mention the importance of sharing their ideas with others in the workplace. Therefore, it can be learnt that the training programme had successfully developed the research participants' ability to externalise ideas.

With regards to the actions and reactions, the following are the examples that illustrated the participants' ability to externalise and express them:

> "If we do not ask other persons that know better than us, then we will repeat our mistakes. For this reason, the elements that I gained from the programme were really critical in shaping my mindset and building my willingness towards sharing culture."
>
> Mr. Ruzuan

> "By observing what I learnt from the programme, I was able to rationalise my working style and consequently improve its effectiveness and efficiency. Having an idea of the work of 10 people is much better when improving our actions and reactions."
>
> Mr. Yaakop

> "When I know that my worker is behaving in a particular way, I will approach him according to that personal value. By practising this, I am able to tackle problems in the site smoothly. In addition, I know how to delegate work appropriately, based on my staff's abilities and constraints. This programme was really helpful in creating this culture and I started to spread it gradually in my unit."
>
> Mr. Zainizam

The above empirical results revealed that Mr. Ruzuan, Mr. Yaakop and Mr. Zainizam described changes in an ability to perform ideal actions and to change their perceptions or working techniques in order to cope with changes in the environment (reaction process). From the responses, it can be learnt that they were able to delegate, empower their staff, contribute to cross-functional decisions and improve important working relationships. This value, in turn, enabled an active re-examination and revaluation process of the needed information. In turn, this development illustrated that the training programme had successfully developed the research participants' ability to generate actions and reactions in the workplace.

As a result of the training programme, the participants described changes in their ability to reflect upon problems and, in turn, determine a suitable solution. These changes were the result of the participants' responsibility and awareness to improve their organisation. They reported being able to sift and prioritise information, evaluate problems from multiple points of view and determine "the right thing at the right time." For example, one of the participants stated that he never consulted his subordinates. If there was any issue, it remained in his mind and therefore all he did was convey instructions to subordinates so that customers' order could be delivered on time. However, after the programme he began to interact with his staff and discussed the problems in the plant using face-to-face meetings. As a result, many personal conflicts in the plant were resolved and the teamwork was improved. In other words, the research participants are better equipped to navigate the dynamic organisational environments and influence effectively within them. The examples are as follows:

> "By asking somebody, I knew how to solve problems effectively and knew the correct contact person. I faced so many types of problems including human-related problems. All of these needed acute responses, and communication was the safest approach to be utilised. This was what the programme had significantly helped me with."
>
> Mr. Abdul Halim

> "Influencing, sharing and inquiring activities are like an early warning system. Through all these activities, I was able to detect working problems earlier and thereafter seek preventions or accordingly corrected the plan. As a result, my unit recently received appreciation from the bosses."
>
> Mr. Mohd Rahmat

From the above statements it can be learnt that Mr. Abdul Halim and Mr. Mohd Rahmat experienced a significant development of the ability to reflect upon problems and, in turn, determine a suitable solution. This ability helped them to effectively utilise knowledge and skills in order to reflect problems in the organisation. This development illustrated that the training programme had successfully developed the research participants' ability to effectively reflect problems.

The above results of ideas, actions, reactions and reflections formulation represent the ability of the participants to effectively externalise and share their tacit knowledge. This was further supported by three findings. The first was that the participants were

motivated to share their work progress with others. In this case they were not restricted to asking the CMMS officers for any specific technical assistance. All the participants in this research felt that there was a significant improvement in implementing the personal level of their maintenance plan and all of them shared the maintenance information with others, especially with the CMMS officers. Second, the participants were actively involved in documenting their ideas, actions, reactions and reflections. These documented inputs were then shared with the system officers for the purpose of updating the CMMS. In this case, the information on the machinery breakdown and maintenance progress was frequently reported to the system officers. This iterative link between the users and systems enabled synergistic inputs to be provided for continuous CMMS development. Third, the CMMS officers described undertaking sole responsibility and an awareness for updating and utilising the contents of CMMS. Updating and utilising the CMMS's contents, in many cases, involved having active communication and face-to-face meetings with the users. All these changes enabled CMMS to obtain new inputs and, as a result, be able to provide current progress of the maintenance jobs to the users (stages F and G of Figure 4.1).

The information about the current progress of the maintenance jobs enabled the engineers to effectively plan the maintenance tasks. In addition, the engineers were able to determine the activities that should be undertaken in order to repair the breakdown machines. These scenarios showed that the learning process occurred. This was strongly reinforced by the finding that the participants actively utilised CMMS for planning and improving their maintenance work. That is, as a result of the training programme, the participants stated that the past, ongoing and future maintenance work progress was actively shared with staff and colleagues in a daily "half-an-hour morning meeting." Any correction plans were also highlighted in the meeting. This meeting acted as a platform to determine the immediate actions to improve the situations or predict the prevention actions for work improvements. All these processes illustrated the occurrence of an active learning process.

Implicit in the above findings was that the seven competency sets did provide a platform to the participants for externalising their tacit knowledge in a creative and spontaneous manner. This was evident from the ideas, actions, reactions and reflections that they documented and shared with the system officer. Therefore, it is declared that stages F and G of this research conceptual framework (as illustrated in Figure 4.1) had

been substantiated. This finding will be utilised to validate the conceptual framework of this research (undertaken in Chapter 6).

When relating the above tacit knowledge externalisation issue to IS development, all the participants agreed that there could be a basis for establishing learning-oriented information. In this case, there was a significant relationship between the documentation of the externalised tacit knowledge with the continuous re-examination and modification of IS contents. It is argued that this type of IS content is capable of promoting OL. The statement made by the one of the system officers was the best example of this issue:

> "The course gave me guidance on how to build a good relationship with users in my department. Before this, when I got a complaint I always considered the users' views from the negative side, such as "they are trying to blame me or damage my reputation". But after the course, I had a positive outlook of them and was also willing to collectively solve the problem."

The aforementioned results supported stages H, I, J and tacit knowledge development of this research's conceptual framework (as illustrated in Figure 4.1), which is that the externalised and shared tacit knowledge led to OL through updated and progressive IS contents. This finding will also be utilised to analyse the validity of this research's conceptual framework in Chapter 6.

From the above discussion it is clear that the development of the seven competency sets can assist in developing an OL-based IS. This is because they create a willingness amongst the staff members to provide knowledge-based inputs to the systems. These inputs, in turn, enable a continuous IS re-examination and modification, given the changing reality. Continuously challenging the current "company norm," such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow. By obtaining access to that current "company norm" and internalising them, the staff members can improve their actions through better knowledge. Consequently, tasks can be undertaken effectively – the learning process. Therefore, at this point it is declared that the conceptual framework used in this research can be applied to diffuse the staff members' knowledge and expertise effectively within the organisation.

5.6 The Differences and Similarities between the Theoretical and Practical Work

This section discusses the differences and similarities between the theoretical and practical work after undertaking the case study. The differences or similarities, in turn, are used to refine the post-pilot conceptual framework of this research. However, before this, a brief description of the lessons learnt from the training programme is advanced.

5.6.1 Lessons Learnt from the Training Programme

Several lessons can be learnt from the training programme, as cited in the previous sections. First, as found in the pilot, the revised training materials and training approaches were able to instil the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse in the participants' minds. This, in turn, highlighted the fact that the developed training materials and approaches were relevant in developing individuals in this research. This finding provides a good basis to examine the applicability of this research conceptual framework in the practical situations.

With regards to the training programme, there was a need to have a beneficial solution between the management and researcher. This requirement was critical in order to conduct a longitudinal study such as this. The organisation used for the research should be convinced of the benefits of the intended research (Ali, 1998). One of the research contributions that can be considered is the undertaking of a special training programme. Nevertheless, the training programme must be supported by strong theoretical and practical foundations (Butcher *et al.*, 1997). A beneficial solution can establish cohesiveness between the management, researcher and participants during the research period, which is critical to the research process.

5.6.2 Lessons Learnt from the Case Study

This subsection discusses the differences and similarities between the theoretical and practical work of this research. The discussion of the theoretical and practical differences is firstly offered.

In Figure 4.1, it is illustrated that the problem in an organisation when diffusing the staff's knowledge is a lack of an element that could trigger the utilisation of knowledge and skills amongst staff members. However, from the case study it was found that an organisation also played a key role in motivating their staff members to utilise their

knowledge and skills. This was evident from the impact of the cooperation that was given to the researcher during the research period. By reflecting upon the commitment that was given by the management to the participants and researcher, the research participants were motivated to actively participate in the training programme and data collection. However, the role of management is not included in the post-pilot framework. This was because the role of management in the pilot case study was so minimal. Therefore, the conceptual framework that is illustrated in Figure 4.1 requires a change. The descriptions and definitions of the revised conceptual framework are provided in Section 5.7.

Having highlighted the differences between the theoretical and practical work of this research but not their similarities, the following paragraphs will describe the similarities between the theoretical and practical work of this research.

The first similarity is the development of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse being central to the development of the seven competency sets. The seven competency sets in turn are central to the idea of individual participation in the IS development process. This is because organisational reality, such as human interaction and business strategy, are not logical, controllable or clear. To deal with reality effectively, abilities such as resilience, good judgement and clear thinking are required (Butcher *et al.*, 1997). To instil these values, individuals must improve their organisational roles, internal strengths, formal and informal discussion and rational discourse.

The second similarity is the development of meta-abilities resulting in the development of influencing skills, sharing attitudes and inquisitive tendencies. These three elements motivate participants to produce their ideas, actions, reactions and reflections. Additionally, the participants are motivated to document their ideas and actions which ultimately enable the systems officer to gain inputs for updating the CMMS. In this case, it was learned that self-documentation, such as writing down the required spare parts, has potential in updating the contents of CMMS. When the information about the required spare parts is keyed into the system, the Materials Management Manager can print out that information and subsequently place an order to the vendor. In short, due to the updated contents, the CMMS is capable of disseminating the updated maintenance schedule and information within Perwaja. By accessing the updated information, the participants

determine the maintenance tasks that need to be undertaken. This means that participants benefit from the CMMS.

5.7 Revising the Conceptual Framework

Reflecting on the above discussion, it can be seen that this research needs to add one more element in its framework, which is the organisation. The other elements are maintained in this research because they are evident in the case study of this research. Based on this viewpoint, the new framework is illustrated in Figure 5.1. The descriptions of Figure 5.1 are offered in the following paragraphs.

In Chapter 2 it is declared that individual development should become the starting point in an OL-based IS developmental framework. Individual development, in turn, is fostered by the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse (Stage A). As noted in chapters 2 and 4, all these elements are proposed by Barham and Rassam (1989), Burgoyne (1988), Schroder (1989), Morgan (1989), Drucker (1992), Pedler *et al.* (1994), Goleman (1995), Fitz-Enz (1997), Butcher *et al.* (1997) and Manogran and Liang (1998). The descriptions and definitions of each element are offered in Section 2.5.2. These elements were selected because being equipped with those elements enables staff members to effectively utilise their knowledge within the organisation, which is critical to the learning process (Goleman, 1995; Butcher *et al.*, 1997). Therefore, the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse is beneficial to be included in learning-based IS development.

The findings in sections 5.5.1, 5.5.2, 5.5.3 and 5.5.4 illustrate that the development of the elements of understanding organisational roles, internal strengths, formality and informality, and rational discourse is followed by a significant development of meta-abilities (cognitive skills, self-knowledge, emotional resilience and personal drive). This scenario is shown in Stage B. Being equipped with meta-abilities enables staff members to determine how and when knowledge will be practised within the organisation (Butcher *et al.*, 1997). These values have potential to motivate staff members to participate in learning processes and should therefore be considered when developing an effective learning-based systems (Choudrie and Selamat, 2004).

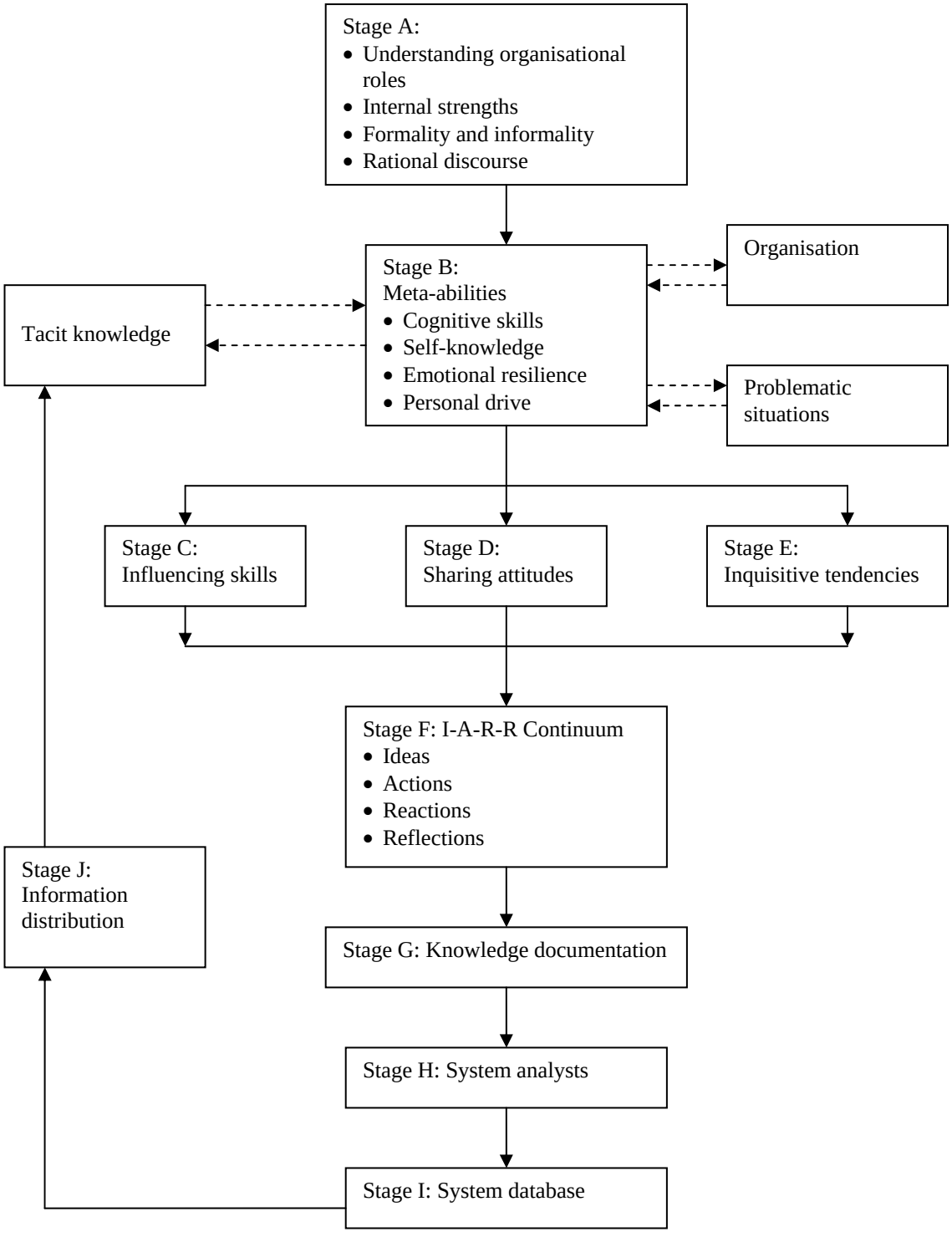

Figure 5.1 Framework for the learning-based information systems

Contrastingly, the findings in Section 5.5.5 illustrate that significant development of meta-abilities is followed by a significant development of influencing skills (Stage C), sharing attitudes (Stage D) and inquisitive tendencies (Stage E). In other words, the elements of understanding organisational roles, internal strengths, formal and informal

discussion, and rational discourse had successfully developed meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies in the research participants' mindsets. This justified the integration of the seven competency sets that are proposed by this research. Being equipped with influencing skills, sharing attitudes and inquisitive tendencies enables staff members to effectively externalise and share their tacit knowledge. This, in turn, provides inputs for IS continuous update (Selamat and Choudrie, 2004).

When undertaking influencing, sharing and inquiring activities, an individual implicitly expresses his tacit knowledge. This expression is either in physical form (actions and reactions) or verbal form (ideas and reflection) (Selamat and Choudrie, 2004) (Stage F). This relationship is evident from the findings in Sections 5.5.6. This I-A-R-R continuum provides externalised tacit knowledge for OL-based IS development (Choudrie and Selamat, 2004). However, it must be documented first (Huber, 1991; Karhu, 2002) (Stage G). This is achieved through the value of self-documentation, which is also developed by meta-abilities (Butcher *et al.*, 1997; Choudrie and Selamat, 2005). This is because, as cited in the previous chapters, due to the development of meta-abilities, the willingness to question implicit assumptions, explore new possibilities and direct energies toward higher standards enables the staff members to be well prepared, using good documented progress reports or working papers (ibid). All these self-documented facts in turn provide inputs for IS continuous update. The updated contents property enables the system to disseminate relevant information and ultimately establish a learning process.

As noted above, the responsibility to update the system is on the hand of system officers. At this stage, the system officers study the documented inputs provided by staff members and codify them (Stage H). By the time the inputs are transformed into codified domains within the CMMS, they become information for assisting staff members in fulfilling their responsibility. In the diagram, this process is represented by Stage I.

The information in the system can be disseminated within an organisation by using networked systems (Stage J). By obtaining new information, an engineer is able to identify a maintenance progress, to access to new maintenance approaches, and ultimately internalising them. At this stage, engineers can improve their actions through better knowledge and consequently can undertake their tasks effectively – the learning process. Through the learning process, an individual's understanding of the organisation's activities

(tacit knowledge) is enriched. This new understanding in turn becomes a platform for continuous IS re-examination and modification processes.

The framework for OL presented in this section represents a framework for the learning-based systems. The framework illustrates the elements that should be considered in order to create a learning environment within the organisation. The cooperation between individuals, the systems officer and the organisation is also an important attribute to include in the process of developing learning-based systems.

To further validate the elements in the framework (Figure 5.1), the empirical findings that are described and defined in this chapter will be analysed by using hermeneutics analysis. The analysis stage is discussed in Chapter 6.

5.8 Summary

The chapter began by describing the research process followed in undertaking the case study. Thereafter, details of the case research process were provided. From the discussions, it became clearer that an in-depth case study was used in the research. The case assisted in examining the suitability of this research conceptual framework in practical situations. The case study that was used in this research was a large organisation.

Similar to the practices undertaken in the pilot case, the data determined from the literature review was presented to the participants by the researcher in an explicit verbal form. For the post-training section, the collated data was in qualitative terms. Consequently, the results were concurrent to the research conceptual framework and the discussions are provided in the chapter. The following chapter will draw on the case study findings and utilise them to validate the proposed conceptual framework of this research. This should allow the research to propose the conceptual framework for OL-based IS development.

6 CHAPTER SIX: Analysing the Conceptual Framework

6.1 Introduction

This chapter describes the analysis process of this dissertation. The aim is to validate the feasibility of the conceptual framework in a real life setting. As noted in chapters 1 and 3, this research utilises the hermeneutic modes of analysis. By undertaking this analysis, it is expected that this research will contribute significantly to the development of an OL-based IS.

6.2 Background Information

A total of 39 respondents participated in this in-depth case study. The number of respondents was based upon those who participated in the training programme and interview sessions, and who completed the training programme evaluation form. The response rate was 100%.

A demographic profile of the subjects is provided in Table 6.1. The data suggest that the participants used in this research consisted of 31 engineers and 8 system officers. Engineers were selected as they are a critical group in the plant; therefore, the learning process was emphasised to them. Alternatively, the system officers were selected because

they provided a platform to evaluate the impact of the framework in IS development. The respondents were not clustered within limited age groups. This was to represent the real composition of the staff members in the maintenance operations. All the respondents possessed bachelor degrees in either engineering or IS. In other words, there was no considerable variation amongst respondents. The respondents' gender profiles were skewed towards males (92.31%), in comparison to the females (7.69%), as a whole. The low number of female respondents was due to a lack of female workers in the steel industry. Table 6.1 provides a more complete summary of the demographic profile.

Table 6.1 Demographic profile of the Perwaja Respondents

	Respondents
AGE:	
Under 25 years	7.69%
25 – 39	56.41%
40 – 54	30.77%
55 or over	5.13%
SEX:	
Male	92.31%
Female	7.69%
EDUCATION:	
Bachelor Degree	100.00%

6.3 Data Analysis

From the empirical results, as illustrated in Chapter 5, it is concluded that, bearing in mind the original objective and the results, two phases to the research process had to be developed. The first was to validate the theoretical underpinnings used for this research, which is achieved in this chapter. The second is to propose a conceptual framework from the findings (stated in Chapter 7).

As mentioned in Chapter 3, this research adopted the qualitative research method. With regards to the qualitative approach taken, the qualitative data was analysed by using hermeneutics. Hermeneutics refers to understanding part of the context in order to comprehend the whole situation (Gadamer, 1976). Therefore, the empirical evidence was analysed from the context of the role of the seven competency sets in enabling tacit knowledge externalisation. In this case, the externalisation of tacit knowledge is determined through the medium of ideas, actions, reactions and reflections. This context

will be analysed to determine whether the integration of the seven competency sets and tacit knowledge externalisation can be used to develop systems that can promote learning.

The process followed by the research to make some sense of the collated raw qualitative data is as follows. When the data was first obtained, there was no structure or boundary assigned to it. For example, when asked about the impact of meta-abilities on sharing attitudes, the respondent said that "the programme improved my ability to instil a good relationship in the unit." That is, in its raw form, the data was just "data" and there was no means of forming any interpretation. Using Gadamer's (1976) and Bleicher's (1980) hermeneutic approaches, the data was provided with some form. In this case, the data to "instil a good relationship" was interpreted as "sharing good values, delegating tasks smoothly and solving problems using a medium of discussion." All these activities represented the sharing and externalisation of ideas, actions, reactions and reflections. A suggestion made by Gadamer (1976) about understanding and interpreting the text was then applied, the results of which can be viewed in this chapter. The data was initially formed in text and assigned to categories established in the literature review. The involved categories are: (1) the confidence to express ideas; (2) the ability to determine and define actions and reactions and (3) the ability to reflect on problems.

In the following sections, the process of analysing the data and validating the conceptual framework for this research are offered.

6.4 The Analysis Trail from the Post-Training Evidence of Respondents

As noted in the previous chapters, there were 39 respondents, which resulted in 39 transcriptions (texts) from their one-guided conversations. A total of 461 pages of A4 transcriptions were generated, which represented approximately 100 hours of respondent-researcher contact time (including the training programme).

It is not possible to offer a trail of all the responses in detail. This is because it will lengthen this dissertation. For illustrative purposes, a brief story of the impacts of the programme on the respondents is presented to allow the reader to appreciate the style and approach taken. Alternatively, the background information, such as age, sex and educational level of the respondents are illustrated in Table 6.1.

Examples of the text are given to illustrate each stage of the process. Every attempt is made to explicate the impact trail, such that the readers can appreciate how intrinsic values are challenging when reporting a linear approach.

6.4.1 Hearing and Writing the Story

As mentioned in Section 3.5, the first stage of the hermeneutic analysis process of this research is hearing and writing the story. To undertake this process, each audio-recorded conversation was transcribed to gain a sense of each respondent's story. These actions encourage entry "into the hermeneutic circle properly" (Bleicher, 1980). This is further enhanced through writing the story in one's own words as it encourages a deeper engagement with the research. It also enables researchers to further appreciate their own prejudices. The written story needs to include personal reflections of the event to illuminate the experience and re-capture the conversation. The writing process offers an act of projection; that is, the gaining of a sense of the whole before the detailed analysis, which involves further reflection, assimilation and questioning (Clarke, 1999). Anticipation of the whole may well occur before it is reached but analysing the parts permits checking the prejudices of the whole. The summary of the written stories follows.

The Story prior to Engaging with the Respondents

Before a visit to the research sites for the data collection, the researcher called the appointed liaison for this research. The liaison was the training officer at the Kemaman and Gurun plants. The liaisons were the same people who assisted in organising the training programme. The researcher requested the training officers to arrange a meeting with all the respondents. At the research sites, the researcher was given a room to undertake the interview session. The researcher asked the training officer to ask the respondents to come to the interview room. This process was undertaken by using a telephone to ensure that the respondents were prepared for the meeting and could be met at a specified time and without disturbing their daily activities.

The Story from the Introductory Meeting

When the respondents came to the room, the researcher greeted them and asked them to have a seat. The response that was received from the respondents was very encouraging, whereby a warm and friendly welcome to the researcher or their facilitator

was provided. Normally, the first 10 – 15 minutes were spent discussing the personal affairs and experiences of the study. This was to create a warm environment of mutual respect and trust.

Thereafter, the researcher explained the purpose of this research, which was to conduct interviews regarding the impact of the training programme on their daily activities. The respondents were eager to begin narrating their story. After a hot drink was served, the researcher and respondents began the narration process. Before the conversations began, the researcher informed the respondents that the conversation was being tape recorded. While the tape recorder was on, the researcher and the respondents began to settle into a conversation. For example, the researcher said that "the aim of this interview is to obtain the information regarding the impact of the training programme on the daily operations. For your information, the interview is being tape recorded. However, the information is highly confidential and, for the research purposes only, could you please share with me the impact of the programme on the development of cognitive skills?" Combined with hand signals, body language and researcher's anticipatory or retrospective interjections of words of encouragement for the respondents to accept or reject, both parties progressed forward. For example, one of the participants said "I am not very happy with my manager." The researcher then stopped the conversation by raising his hand and asked the participant to elaborate: "What are the factors that make you feel dissatisfied with your manager?" The participants elaborated by giving the factors that make him dissatisfied with the manager, such as one-way communication, unfair performance evaluation and others.

Based on the responses, the interview sessions took at least four weeks to complete. In average, each interview took around two hours. However, there were instances when the researcher needed to visit the research sites again. This was to meet the respondents who could not be interviewed during the first visit. The respondents told their story with laughter, determination, patience and humour. More importantly, it was an open, direct account. For example, one of the respondents said: "My subordinates bypass me and report directly to the boss. This was very annoying." Then the researcher replied: "I face the same problem in the workplace. My research group members did not inform their problems to me. Instead, they expressed their problems to someone else and this tarnished my image. However, I calmed down and had a meeting with them to resolve the issue. So this

scenario is normal in the workplace." By conducting an open, direct account interview session, both parties progressed forward. The respondents' stories are dealt with in the following subsection.

The Respondents' Story

The story of each respondent is structured around experiences in his/her department. As mentioned in chapters 3 and 5, the respondents were based in the maintenance and IS departments. The maintenance operations in the Kemaman plant are undertaken by six different departments: (1) instrumentation; (2) mechanical services; (3) water; (4) electrical; (5) crane and (6) maintenance planning. The Gurun plant, on the other hand, has two maintenance departments: (1) maintenance solutions; and (2) utilities. The descriptions of each story are dealt with in the following subsections.

Instrumentation Department

The instrumentation department is responsible for maintaining the electrical equipment, instruments and automation in the steel meltshop plant. It also manages the operation of the calibration laboratory. The department also maintains the electrical equipment, instruments and automation in Petronas and several chemical companies around Kemaman – external jobs. Overall, there are five units in the instrumentation department. Therefore, five respondents were selected to represent the instrumentation department in this study. The involved respondents are responsible for operating CMMS and were as follows: (1) Mr. Mohd Syafawi (electrical services); (2) Mr. Mohd Syukri (instruments); (3) Mr. Mohd Azmi (automation); (4) Mr. Yumas (laboratory) and (5) Mr. Zainizam (external jobs).

After the course, Mr. Mohd Syafawi was able to control his emotions when dealing with others in the workplace. The largest problem that he faced in Perwaja was that other departments always blamed his department when there was no electricity. Other departments always said that the people in the instrumentation department did not do their jobs. However, during the interview session he said "I was able to control my emotions in whatever situation were encountered in the workplace. In addition, I became more open in discussions, where we had to find the best solution to particular problems." In this case, after the programme, Mr. Mohd Syafawi was able to control his emotions by calming down and tackling the problem through the medium of discussion. He was also motivated

to improve his knowledge and skills in the electrical services area after the course. He stated, "When I now get available time, I read all the mechanical drawings and try to understand them. So, when somebody informs me about any machine breakdown, I can easily determine what part of the drawing I should refer to." These activities illustrate that Mr. Mohd Syafawi gained the strength to communicate and to share his views with others. Documenting these views enables useful and relevant inputs to be provided for organisational IS development.

From Mr. Mohd Syukri's side, the course gave him valuable inputs on how to effectively manage people and tasks. Before the programme, he was shy when interacting with others, especially with his subordinates and manager. Therefore, his staff were doing what they only wished to do. For example, when he instructed his staff to repair part A of a machine first, they just ignored the instructions and worked on part B. This was annoying to Mr. Mohd Syukri. However, the programme gave him the strength to manage his people effectively. This was evident from this statement: "After the course, I said to myself "How should I manage my staff, improve my relationship with superiors and obtain good planning?" All these thoughts kept circling in my mind." As was stated by Mr. Mohd Syukri, he obtained the feeling of responsibility to manage his unit properly as a result of the programme – personal drive. By interacting with his subordinates and manager, Mr Mohd Syukri can determine the best solutions to particular problems. Documenting these solutions enables useful and relevant inputs to be provided for organisational IS re-examination and modification.

When Mr. Mohd Azmi returned from the programme, he was able to determine the best approach that increased the level of quality in his work. This is evident in this statement: "I got brilliant ideas on how to do the work according to the accepted procedures and set a target. In addition, I was able to interpret the behaviour of a person and his advantages and then manipulate them for the sake of work improvement. This was undertaken through an open-minded and no-hard-feeling discussion." In other words, Mr. Mohd Azmi was able "to notice and interpret what happened in interpersonal situations; to entertain multiple perspectives and integrate them; to envision strategic futures; and to sort and analyse data" after the programme (Butcher *et al.*, 1997). These skills, in turn, allowed Mr. Mohd Azmi to interpret situations, understand them and then resolve problems. In short, the impact of the programme on Mr. Mohd Azmi was on the development of

cognitive skills. For example, when facing a sudden machine breakdown, he discussed the problem with other engineers first before giving any instruction to his subordinates. These activities, in turn, illustrated Mr. Mohd Azmi's abilities to effectively utilise, share and externalise tacit knowledge through the medium of ideas, views and actions. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS (Selamat and Choudrie, 2004).

Contrastingly, Mr. Yumas described an improvement in personal confidence after the course. He said, "The most significant impact was the development of personal confidence. Before the course, I was so dependent on other colleagues and not so confident in decision making. For example, "when the machine broke, I would wait for instructions from my manager or other engineers regarding the actions that should be undertaken." However, the course made me question myself: "what I am going to do, how to develop my unit; if I felt confident with one thing, should I be definite in it and did I form the right decision?" By answering all the questions through relevant and reliable actions, Mr. Yumas said that he was appreciated by his staff and colleagues and they began to seek more opinions from him. Additionally, he experienced a tremendous improvement in the willingness to settle a problem through the medium of discussion. This was achieved through daily morning meeting or face-to-face meetings. The meetings enabled him to obtain inputs for tackling problems effectively. From these statements it can be seen that Mr. Yumas experienced a profound development of the ability to face and deal with difficult situations more effectively and to be more able to apply his skills and knowledge at these times – emotional resilience. When undertaking these activities, Mr. Yumas implicitly expresses his tacit knowledge. This expression is either in physical form (actions and reactions) or verbal form (ideas and reflection). Documenting the externalised and shared tacit knowledge enables useful and relevant inputs to be provided for organisational IS development.

After the course, Mr. Zainizam experienced an improvement in motivation to work hard in the workplace. As he said, "Sometimes my staff and colleagues told me that 'why do you work so hard, when you know that there will be no salary increase.' My response was that type of thinking should be changed because the most important thing in the workplace is fulfilling our responsibility to the company… My main point was that we should perform work sincerely." From this statement it can be learnt that Mr. Zainizam

was very motivated in doing his work and contributing to Perwaja's performance. In short, the impact of the programme on Mr. Zainizam was on the development of personal drive. This value, in turn, enabled an active re-examination and revaluation process of the needed information.

From the above discussion, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse have successfully improved the participants' meta-abilities. This was illustrated by the development of the capability to deal with people, tasks and situations in a more friendly and smooth manner. These activities, in turn, illustrated the participants' abilities to effectively utilise, share and externalise tacit knowledge through the medium of ideas, views and actions. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS (Selamat and Choudrie, 2004). In addition, through the face-to-face meetings during the training programme, the relationship between the researcher and participants was very close. As a result, the participants freely expressed their experiences and feeling. To recapitulate, the impact of the programme on the respondents from the instrumentation department was significant. To further discuss the respondents' story, the next subsection will offer the story of the mechanical services department.

Mechanical Services Department

The mechanical services department is responsible for the quality, health and safety environment. It consists of two units; the internal services and external services units. Four respondents represented the mechanical services department, they are (1) Mr. Rosli (internal services unit); (2) Mr. Mohamed Ridzuan (internal services unit); (3) Ms. Zuriana (external services unit) and (4) Mr. Zakaria (external services unit).

When asked about the changes experienced after the course Mr. Rosli replied, "The course motivated me to work hard and with due diligence. If a job needed to be completed urgently, I would do it without a break. All staff and colleagues are like a family in which the occurrence of the problem will be discussed together." What can be elicited from this statement is that after the course Mr. Rosli gained internal strengths to contribute in a significant way to the organisational development. The statement, "…I would do it without a break" showed that Mr Rosli gained strengths to work hard and fulfil all his

responsibilities – personal drive. This resulted in a willingness to utilise the company's resources intelligently and wisely. When undertaking these activities, Mr. Rosli implicitly expresses his tacit knowledge through the medium of ideas, views and actions. Documenting the externalised and shared tacit knowledge enables useful and relevant inputs to be provided for organisational IS development.

On the other hand, Mr. Mohamed Ridzuan shared this feeling with the researcher: "The programme assisted me in many aspects. The most significant one was that I could dare to take risks by doing something new. I moved to a new department recently and although my colleagues strongly advised me to not doing so because the tasks in that department are very challenging and difficult. I still did it. What came across in my mind was that 'if other people can do it, so why can't I?' In short, the programme encouraged me to change." In other words, the course made Mr. Mohamed Ridzuan stronger in facing newer possibilities in the company – emotional resilience. As a result, Mr. Mohamed Ridzuan was able to communicate with others without any hard feeling. By documenting the externalised and shared tacit knowledge that were generated during the communication process, Mr. Mohamed Ridzuan can provide inputs to the system analyst for updating the system.

With regards to Ms. Zuriana, the researcher found that the respondent did not appreciate the programme so much. From the conversation, it was found that she was dissatisfied due to the workplace conditions. She claimed that no-one was cooperative, took advantage of her and isolated her. All these inhibited her from sharing the elements that were discussed in the programme. Nevertheless, she admitted the course improved her self-knowledge as she was able to determine the best action to be undertaken at one time. She said, "The programme gave me the spirit to undertake all work in due diligence. I accomplished the work in its timeframe. I solved the problematic issues by consulting other members and the boss. If the work was not within my capability, I would inform my superior." Self-knowledge enabled Ms. Zuriana to consider a range of options in her own behaviour and to make better judgements of what to do. When undertaking these activities, Ms. Zuriana implicitly expresses her ideas and actions. Documenting these ideas and actions enables useful and relevant inputs to be provided for organisational IS development.

For Mr. Zakaria, the programme improved his ability to ask others about the approach in undertaking a task and his sense of responsibility to the company. He said, "After the programme, the significant impact that I felt was the ability to ask other members, involve others in my work and be responsible for the company's development." In addition, the programme helped him to recognise his personal aims and objectives, which assisted in avoiding unsystematic job implementations. The programme made Mr. Zakaria more patient, sincere and hard working. This was evident from this statement: "This programme instilled virtuous values that enabled me to be patient, sincere and hard working. Whenever people got annoyed with me, I do not get angry as I know I did my job sincerely and so I knew that I was right. I have also become patient. I just ignore what other people say." In short, the impact of the programme on Mr. Zakaria was on the development of cognitive skills and self-knowledge. In turn, this development enabled Mr. Zakaria to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr. Zakaria to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

To recapitulate, the programme made a significant impact upon the respondents from the maintenance services department. Although Ms. Zuriana did not benefit from the course, she did experience a significant improvement in self-knowledge and emotional resilience values. In short, the programme had successfully developed the participants' ability to control emotions, as well as their relationship with others and a sense of responsibility to develop Perwaja. These elements, in turn, assisted the participants in determining how and when knowledge can be used – meta-abilities. As a result, the participants were motivated to share ideas and act wisely in the workplace. This scenario illustrated that the participants gained strength to actively externalise and share their knowledge. Documenting these ideas and actions enables useful and relevant inputs to be provided for organisational IS development. This finding is parallel to the finding of the participants in the instrumentation department. Having described the findings from the mechanical services department perspective, the next subsection will describe the findings from the water department perspective.

Water Department

The function of the water department is to oversee the operations and maintenance of the water facilities, water treatment plant, industrial water cooling facilities, gas and

compressed air facilities. These services are under the internal services unit. The department also gets involved with external jobs, such as maintaining the water treatment plant, repairing pumps, undertaking overhaul services, piping and others. Mr. Hazis and Mr. Azahari represented the internal service unit, whereas Mr. Samsulisam and Mr. Shaarin represented the external service unit.

Prior to the programme, Mr. Hazis's and Mr. Azahari's relationships with the manager were not good. This was due to the relationship being based on one-way communication and no appreciation from the manager's side. For example, if one task was accomplished before the deadline, the manager was reluctant to say "thank you". The impact of this problem could be noticed in the reactions or responses that they gave in the interview sessions. However, both parties progressed using the combination of hand signs, body language and the researcher's anticipatory or retrospective interjections of words for the respondents to accept or reject their views. From the feedback, it was noticed that the programme improved Mr. Hazis's and Mr. Azahari's communication skills and ability to control emotions. This was evident from this type of statement: "However, for the sake of the company, I have to face all these annoying scenarios nicely and wisely…" Since both of them faced a problem with the manager, the improvement in communication skills and emotional resilience was anticipated. In this case, Mr. Hazis and Mr. Azahari were told to be patient and communicate appropriately with the manager to ensure that all the tasks were accomplished in accordance with an established procedure. By communicating with others and controlling emotions, Mr. Hazis and Mr. Azahari can externalise and share ideas and feelings healthily. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS.

Contrastingly, the programme gave valuable inputs to Mr. Samsulisam, regarding understanding the scope of work and planning effective tasks. Before the programme, he had no targets and was unsure of his responsibilities to the company. He said, "This programme assisted me in planning my daily work. First and foremost is planning my organisational goals and work targets. Before this, I had no targets, but after the programme I could feel the importance of having them. It made me clearer on what I was trying to achieve in the future. The course improved my internal strength to contribute significantly to the company. This course made me feel responsible when undertaking tasks with due diligence. Before this, I was demotivated whenever I faced a problem in the

workplace. After the course, however, I gained a sense of responsibility to contribute to the organisational development." From this statement it can be learnt that the programme assisted Mr. Samsulisam in planning his organisational tasks effectively. In short, the impact of the programme on Mr. Samsulisam was on the development of self-knowledge and personal drive. In turn, this development enabled Mr. Samsulisam to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr. Samsulisam to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

From Mr. Shaarin's side, the attendance on the programme had improved his personal confidence, motivation and managerial knowledge. Before the programme, Mr. Shaarin faced difficulties in organising his actions appropriately. This was based on this statement: "This course developed my self-confidence, my awareness to undertake tasks according to their priority, my ability to solve problems collectively and effectively and my skills to determine what should be done at every time and my situation in the company. For example, I always had a face-to-face meeting with my boss to discuss the best action or reaction in dealing with maintenance problems… I am a bad tempered guy. I would give an instruction in a direct manner, without a friendly smile or joke. This scenario may be due to the army training that I gained from the university. But after the course, I was able to control my temper. I could feel the change in my action or approach. In addition, I was able to deal with my colleagues and staff." In short, the attendance on the programme enabled Mr. Shaarin to manage his actions in the workplace effectively – cognitive skills, self-knowledge and emotional resilience. Being equipped with these abilities, Mr. Shaarin was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Shaarin actively obtaining clarification and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

From the aforementioned discussion it became clear that the programme made a large impact on the respondents from the water department. In short, the programme had successfully developed the participants' ability to control emotions, actions and relationship with others – meta-abilities. Being equipped with these abilities, the participants were able to determine when and how to utilise their knowledge when facing problems. This resulted in the participants actively obtaining clarification and sharing ideas

with others. All these represented an improvement in their ability to externalise and share tacit knowledge. In other words, the programme developed their ability to externalise and share tacit knowledge amongst the participants from the water department. By documenting the externalised and shared tacit knowledge, the research participants can provide inputs to the system analyst for updating the system. This finding further supports the finding in the previous departments. The next subsection will describe and define the changes that were experienced by the electrical department staff.

Electrical Department

The electrical department involves the power operation and maintenance of the Kemaman plant. There are four units in the department: (1) the direct reduced plant unit; (2) steel meltshop unit; (3) water treatment plant unit and (4) the port and conveyer unit. The four people that represented electrical department were as follows: (1) Mr. Yaakop (direct reduced plant unit); (2) Mr. Norazlan (steel meltshop unit); (3) Ms. Herlina (water treatment plant unit and (4) Mr. Mohd Zulmahri (port and conveyer unit).

The first time the researcher met Mr. Yaakop, he was very happy and eager to be interviewed. He was not like the other respondents that had been met before. After having a nice chat with him, the researcher began to ask about the impact of the programme on his daily activities. The first and foremost aspect that he highlighted was the confidence to talk to or communicate with others. According to him, before the programme he was very shy and timid and had no interest in interacting with others. In other words, he just did his own work. However, after the programme he gained the willingness and confidence to interact with others and started to participate in the department's activities. This was evident from the following statement:

> "Before the course, I was reluctant to talk to anybody in the workplace. But after the course, I had the self-confidence to talk to everybody. I admitted to myself that in whatever condition I have to talk and express my views. Without communicating with the others, the organisational task cannot be undertaken easily. In the beginning, I was quite nervous. But it is improving day by day. I shared the ideas in the training module with my staff and colleagues. The elements that were discussed in the programme assisted me with improving my communication skills. By talking to others, I began delegating tasks and persuading others to follow my way more effectively. All this really helped me in coordinating organisational tasks in my unit. The responses from my staff were so positive

> and everybody started to work together. The values that were shared included good perception to others, self-confidence, best practice application and others. Everybody must put an effort in improving his knowledge and skills."

From the above statement it can be seen that Mr. Yaakop experienced a profound development of the ability to consider a range of options in his own behaviour and to make better judgements of what to do. These skills allow him to use other skills and knowledge more flexibly (Butcher *et al.*, 1997). In other words, Mr. Yaakop experienced a profound development of self-knowledge. In turn, this development enabled Mr. Yaakop to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr. Yaakop to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

The attendance on the programme enabled Mr. Norazlan to improve his decision making skills. Before the programme he was afraid of making decisions due to the risk of making mistakes. This was based on this statement: "Before the course, I did not know how to solve problems in an effective manner. After the course, my mind began to consider planning for the unit, the approach to integrate all members in the decision making process such as through discussion, face-to-face meetings, dialogues and meeting with the senior management. The meeting discussed the problems, their causes and the actions to solve them. In other words, the course gave me smooth guidance on how to tackle problematic situations effectively and efficiently." This value, according to Mr. Norazlan, resulted in the capability to organise tasks more systematic and efficient. In short, the impact of the programme on Mr. Norazlan was on the development of cognitive skills and self-knowledge. This development illustrated that the training programme had successfully developed Mr. Norazlan's ability to externalise and share his tacit knowledge through the medium of ideas and action plans. These externalised and shared ideas and action plans can provide synergistic inputs for a continuous development of IS.

Ms. Herlina was one of the three female respondents who participated in this study. She was active and talkative during the conversation. It was surprising since she was quite passive during the training programme. In relation to the programme, she said, "From the course, I became aware of the importance of practising best norms in the workplace. I became more focused in what I am going to achieve in my future work. I must work hard to achieve the best in the workplace. It encouraged me to think big, have a good picture of

my responsibility and have a strong determination to achieve all my goals." The points of the impact of the programme that she shared with the researcher were basically relating to these values. In short, the programme instilled the ability to plan work and motivation to do the best within the company – cognitive skills, self-knowledge and personal drive. These elements allowed Ms. Herlina the personal robustness to read situations, understand, and resolve problems, and to persist, motivate others and meet targets. Through all these activities, Ms. Herlina was able to externalise and share her tacit knowledge through the medium of ideas and action plans. These externalised and shared ideas and action plans can provide synergistic inputs for a continuous development of IS.

From Mr. Zulmahri's perspective, the programme instilled virtuous values that were critical in these processes: (1) solving problems; (2) understanding better work of scope; (3) increasing a sense of responsibility to the company; (4) improving relationship with other members and (5) increasing motivation to give the best to the company. This was extracted from this statement: "the training programme was really helpful. It discussed the best procedures that should be followed in problem solving and instilled virtuous values for the effective work. After the course, I became clearer on the scope of my work, obtained the ability to prioritise information and tasks and managed to handle tasks better than before." In other words, Mr. Zulmahri experienced a profound development of meta-abilities. In turn, this development enabled Mr. Zulmahri to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr. Zulmahri to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

From the aforementioned discussion, it is clear that the programme did give a significant impact to the electrical department's staff. The impacts were widespread from organising tasks to managing human-related issues. In other words, the electrical department's staff experienced a significant development of meta-abilities. These impacts enabled the participants to actively externalise and share their knowledge and skills. Therefore, it can be learnt that the programme had successfully developed the ability to externalise and share tacit knowledge amongst the participants in the electrical department. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS. This finding is parallel to the finding in the previous

departments. The next subsection will discuss the impact of the programme on the crane department's staff.

Crane Department

The crane department is responsible for maintaining the crane in the steel meltshop and port. In the steel meltshop, the crane is used to move the ladle furnace to the casting section. Contrastingly, the crane at the port is used to unload iron ore and pellets from the vessel to the stockyard. Additionally, the department also involves external jobs. Three respondents represented the crane department and the entire unit of the department: (1) Mr. Azize represented the port unit; (2) Mr. Mohd Rahmat represented the steel meltshop unit and (3) Mr. Mohd Adi represented the external job unit.

During the interview session, the three respondents were asked about their feelings before and after the training programme. Mr. Azize expressed his difficulties in handling the subordinates and organising maintenance tasks. He said that, before the programme, his desk was messy and piled up with files, documents and stationery. Everything was in the worst condition. In addition, the tasks were delegated unsystematically, which ultimately ended with dissatisfaction amongst the subordinates. However, after the programme, he gained enthusiasm and motivation to organise the unit's tasks and office systematically. In addition, he started to mingle with his staff, communicate with them and make them feel like they belong to the unit.

> The programme not only developed me, but also my unit members. After the programme, I had the strength to explain the right way in undertaking designated jobs to all my staff. Before this, they just followed their gut feeling in undertaking tasks, which normally ended with a low level of work quality. At the moment, the situation is improving on a daily basis.

From the above statement it can be learnt that Mr. Azize experienced a significant development of self-motivation and determination and a willingness to take responsibility and risks. This helped Mr. Azize to persist, motivate others and meet targets (Butcher *et al.*, 1997). In other words, Mr. Azize experienced a significant development of personal drive. In turn, this development enabled Mr. Azize to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr.

Azize to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

Contrastingly, after the programme, Mr. Mohd Rahmat gained the strength to build a good relationship with his boss, colleagues and staff. Before the programme, he always had a bad perception of the other members and departments and therefore tended to quarrel with them. This situation worsened in cases where his staff did not report to him but to the manager. However, after the programme he had the strength to face the relevant staff and manager directly to improve the situation. As a result of the programme, he always had positive thoughts about facing all the problems and staff in the unit. In other words, Mr. Mohd Rahmat experienced a profound development of emotional resilience. These skills allowed Mr. Mohd Rahmat the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). Being equipped with these skills, Mr. Mohd Rahmat was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Mohd Rahmat actively obtaining clarification and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

Mr. Mohd Adi, on the other hand, mentioned his difficulty in solving problems before the programme. He was not clear on how to tackle problems in an effective manner. After the programme he could envision a smooth way of solving a problem by utilising the platform of discussion and good relationship. He stated that the course gave him the "awareness and initiative to involve others in the decision making process." In short, the impact of the programme on Mr. Mohd Adi was on the development of cognitive skills. This development, in turn, enabled Mr. Mohd Adi to externalise and share his tacit knowledge effectively. This externalised and shared tacit knowledge can provide synergistic inputs for a continuous development of IS.

From the aforementioned discussion, it can be learnt that the programme assisted the participants in the crane department in organising tasks and managing relationship with the subordinates. These activities involved an active use of knowledge and skills – meta-abilities. In other words, the programme assisted the participants to effectively externalise and share their tacit knowledge. By documenting the externalised and shared tacit knowledge, the research participants can provide inputs to the system analyst for updating the system. This finding substantiates the findings of other departments. Whilst this

subsection discussed the impact of the programme on the respondents from the crane department, the next subsection will describe the stories of the respondents from the maintenance planning department.

Maintenance Planning Department

The maintenance planning department is responsible for planning the maintenance tasks and schedule. Four respondents represented this department in the study which were as follows: (1) Mr. Mohd Wahyudi; (2) Ms. Susi; (3) Mr. Mazalan and (4) Mr. Nordin.

Upon returning from the programme, Mr. Mohd Wahyudi was able to improve his personal confidence, communication skills and prioritise work. This was evident from this statement: "The first thing that I learnt from this course is how to build up my internal strength and self-confidence. So everything that I learnt was related to self-confidence, effective communication, virtuous values in work and cognitive skills. Although in the beginning I felt very bored, later on I was able to think on a global scale." On top of this was Mr. Mohd Wahyudi's ability to talk to others: "The most that I learnt from this course was communication skills. With this skill, I was able to solve problems rationally and control emotions during the meeting. If I had a problem, I could express it and have no need to blame anyone else. So with this skill and rational discourse, I was able to solve the problem effectively." From this statement it can be learnt the programme enabled Mr. Mohd Wahyudi to feel confidence when communicating with others and organising tasks – cognitive skills and emotional resilience. Being equipped with these abilities, Mr. Mohd Wahyudi was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Mohd Wahyudi actively obtaining clarification and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

Contrastingly, Ms. Susi experienced an improvement in cognitive skills due to her attendance on the programme. She said, "The programme made me aware of my aims, and thereafter motivated me to work hard and smart because I knew my aims. It instilled a sense of responsibility and belonging to the company. Now it is implicit that every single cent that I receive from the company is a responsibility that I must fulfill." The development of cognitive skills assisted Ms. Susi to read situations, understand and resolve

problems. These abilities, in turn, enable Ms. Susi to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

Mr. Mazalan made the following statement to highlight the impact of the programme on his daily activities: "The attendance on the programme assisted me in solving problems in the workplace through good relationships and communications. I practised the elements that were obtained from the programme in the workplace gradually… It made me more concerned with the welfare of my staff. This is for the sake of cohesiveness in the workplace… This course increased my internal strength to face all the difficult, sad and hurtful moments in the workplace." The statements showed that the programme enabled Mr. Mazalan to improve his ability to solve problems through the medium of communication. In other words, Mr. Mazalan experienced a profound development of emotional resilience. These skills allowed Mr. Mazalan the personal robustness to direct their energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). Being equipped with these skills, Mr. Mazalan was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Mazalan actively externalising and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

From Mr. Nordin's side, the programme was able to develop his skills in organising and undertaking more tasks systematically. He said, "After the course, I put the target that all the tasks should be completed before the deadline. So far, my achievement is encouraging. The course has made me more responsible for what I am doing right now in which I am using the best approach in handling my tasks. The tasks that were given to me were completed before the deadline." From this statement, Mr. Nordin highlighted the ability to judge about how to approach different situations by helping him to distinguish between his personal needs, the needs of the situation and of other people. This could enable him to determine how to change his approach or even push him into action when he could have otherwise done nothing. All these abilities, in turn, develop Mr. Nordin's self-knowledge (Butcher *et al.*, 1997). When undertaking these activities, Mr. Nordin implicitly expresses his tacit knowledge. This expression is either in physical form (actions and reactions) or verbal form (ideas and reflection). Documenting the externalised and shared tacit knowledge enables useful and relevant inputs to be provided for organisational IS development.

From the above discussion it can be learnt that the research participants experienced a significant development of meta-abilities – abilities to effectively use their tacit knowledge. This was because the programme had successfully improved participants' skills of communication, solving problems and building a good relationship with others. Being equipped with these abilities, the participants were able to determine when and how to utilise their knowledge when facing problems. This resulted in the participants actively externalising and sharing ideas with others. By documenting the externalised and shared tacit knowledge, the research participants can provide inputs to the system analyst for updating the system. In short, this finding further supports the finding of the previous departments. Whilst this subsection discussed the impact of the programme on the respondents from the maintenance planning department, the next subsection will describe the stories of the respondents from the maintenance solutions department.

Maintenance Solutions Department

The maintenance solutions department is based at the Gurun plant. The department is responsible for maintaining all types of machines from the aspects of mechanical, electrical, automation and voltage – internal services unit. It also involves external jobs such as with Petronas, SIRIM Ltd. and Lafarge Cement Ltd – external services unit. Two respondents came from the internal services units: Mr. Kamal and Mr. Ruzuan. On the other hand, the external services unit was represented by Mr. Abdul Rahim and Mr. Md Isa.

Mr. Kamal gained a significant impact on the ability to improve relationships and share information with others after the course. He observed, "This programme inspired me to build a good relationship and to share information with others. This resulted in an effective and efficient task implementation. I did not practise unkind remarks but listened to others' heartfelt expressions. My relationship with top people is good and I always consult them in many issues." In addition, he experienced an improvement in the strength to control emotions after the course. In short, the programme assisted Mr. Kamal in building a good relationship and sharing information with other colleagues and subordinates – emotional resilience. These abilities, in turn, enable Mr. Kamal to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

Upon returning from the programme, Mr. Ruzuan had noticed changes in his ability to be patient and motivated to perform tasks in a collective manner. Before the programme, establishing collective tasks was a big problem for him. These experiences were expressed in this statement: "This course taught me to be patient when dealing with the staffs' behaviours and conflicts in the workplace… I got a feeling that all the staff members are like a family. Without them, I cannot complete the work effectively and efficiently. Before this, I just instructed my staff on what was supposed to be done. However, after the course I got a strong feeling to work together with them to achieve the goals." From this statement, it can be learnt that Mr. Ruzuan gained the abilities to control emotions and create teamwork in his unit after the programme. These skills allowed Mr. Ruzuan the personal robustness to direct his energies, deal with intense situations and manage challenges healthily (Butcher *et al.*, 1997). These abilities, in turn, enable Mr. Ruzuan to externalise and share his tacit knowledge effectively. By documenting the externalised and shared tacit knowledge, Mr. Ruzuan can provide inputs to the system analyst for updating the system.

The researcher met Mr. Abdul Rahim in his house. The session with him was of the longest duration. According to him, the programme had increased his strength to communicate with his subordinates and superiors. The strength to communicate with others was utilised by him to solve problems through formal or informal discussions, guiding staff in the daily operations and working happily and scrupulously. The following statement explains his satisfaction with the programme:

> The course has changed my behaviour from being timid to being friendly to everyone. Before this I was not very friendly. After delegating the tasks to my subordinates, I would concentrate on my own work. But after the course I always met my subordinates to ask about work progress, problems and internal feelings due to heavy work burdens. If necessary, I would assist them in solving their personal problems. In addition, I became strong when facing my colleagues in a meeting and expressing my views if necessary.

From the above statement it can be seen that Mr. Abdul Rahim experienced a profound development of self-control and discipline, the ability to use emotion well to cope with pressure and adversity and balance feelings about oneself – emotional resilience. Being equipped with these abilities, Mr. Abdul Rahim was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Abdul Rahim

actively externalising and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

For Mr. Md Isa, the course gave him awareness about his responsibilities to the company and the need to work scrupulously. When asked about the impact of the programme on his daily operations, he replied: "Yes, from the perspective of talking and socialising with others… If I glanced back to the content of the module and what has been discussed in the programme, I will now question myself "who am I, where I am right now, whom I am working with and others?" This feeling will remind me what should be done or accomplished in the workplace, who I should refer to and delegate work wisely and nicely… For me, if I am not completing the tasks, it is like I am betraying the company. Therefore, this value strengthened my spirit to contribute significantly to the organisational development… This course stressed the importance of a sense of responsibility and belonging to the company. These values made me more confident to deal with other members and face difficulties when undertaking tasks in the company." In short, the programme had successfully increased Mr. Md Isa's sense of responsibility to give the best to Perwaja – personal drive. This helped Mr. Md Isa to persist, motivate others and meet targets (Butcher *et al.*, 1997). This development, in turn, enabled Mr. Md Isa to actively obtaining clarification and sharing ideas with others. These externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

To recapitulate, the respondents from the maintenance solutions department benefited from the programme significantly. This can be seen from the abilities to control emotions, build a good relationship with others and communicate with others – meta-abilities. These abilities represent an active process of utilising and sharing tacit knowledge amongst the participants. In short, the programme had successfully developed the participants' abilities to effectively externalise and share their tacit knowledge. Documenting this externalised and shared tacit knowledge can develop synergistic inputs for a continuous development of IS. Due to the updated content, that type of IS can assist in promoting OL. This finding, in turn, further supports the findings of the previous departments. Whilst this subsection discusses the feedback from the maintenance solutions department staff, the next subsection will describe the feedback from the utilities department staff.

Utilities Department

The utilities department is also based at the Gurun plant. It is responsible for operating and maintaining the facilities equipment, electronic equipment, electric power, vehicles, cranes and water treatment at the Gurun plant. These services are placed under the internal services unit. The department is also involved with external activities, such as the Public Work Department and Ministry of Education. Two staff represent the internal services unit; these are Mr. Tg Mahathir and Mr. Abdul Halim. Mr. Zulkipli represents the external services unit.

By attending the programme, Mr. Tg Mahathir was able to understand his responsibilities and scope of work better. Additionally, he was able to delegate tasks more smoothly and more efficiently than before. He noted this in the statement: "After the course, I felt more responsible towards my tasks. This sense of responsibility gave me strength to successfully complete one task after another. I would undertake a task without any complaining remarks. I delegated work to my staff according to their interests and skills. I did not want to be too bossy. Instead, I would coach my staff and assist them according to my ability." In short, the programme improved Mr. Tg Mahathir's sense of responsibility and ability to organise organisational tasks. In other words, Mr. Tg Mahathir experienced a significant development of cognitive skills and personal drive. When applying these skills, Mr. Tg Mahathir implicitly expresses his tacit knowledge through the medium of ideas, actions, reactions and reflections. Documenting the externalised and shared tacit knowledge enables useful and relevant inputs to be provided for organisational IS development.

Mr. Abdul Halim benefited from the programme in terms of the ability to understand the surrounding environment before making decisions. As mentioned in the interview session, "This programme gave me a valuable input on how to improve relationships with others and understand the working environment. As a result, I became aware of my weaknesses in the workplace and tried to gradually improve it." In this case, the attendance on the programme enabled Mr. Abdul Halim to be self-critical in concerning the workplace. This development, as noted by him, resulted in the right decision being made at the right time – self-knowledge. When undertaking these activities, Mr. Abdul Halim actively obtaining clarification and sharing ideas with others. These

externalised and shared ideas can provide synergistic inputs for a continuous development of IS.

Mr. Zulkipli developed internal strength and communication skills by attending the programme. This internal strength resulted in an awareness and willingness to maximise the productivity of the unit. The communication skills played an important role in integrating the unit members and, in turn, improving the relationship between them. The following statement illustrated these scenarios:

> As he said, "First of all, this course increased the spirit to work hard in me and I did not feel like giving up when undertaking tasks in the workplace. Second, it improved my personal confidence in doing a job. Third, this course improved my communication skills and willingness to build a good relationship with boss, colleagues and subordinates. So it became clearer to me on how to manage my work and departmental members."

From the above statement it can be learnt that Mr. Zulkipli experienced a significant development of self-motivation and determination and the ability to face and deal with difficult situations more effectively. In other words, Mr. Zulkipli experienced a significant development of emotional resilience and personal drive. In turn, this development enabled Mr. Zulkipli to externalise and share his tacit knowledge effectively. It is suggested that being equipped with these abilities enables Mr. Zulkipli to provide ideas or views (inputs) for a continuous re-examination and modification of IS.

The aforementioned discussions revealed that the staff from the utilities department also benefited from the programme. This was evident from the improvement in the values of communication skills, decision making and organising tasks. In other words, the programme had successfully developed the participants' abilities to determine how and when knowledge can be used – meta-abilities. Implicit in these values is the ability to effectively externalise and share knowledge and skills. By documenting the externalised and shared tacit knowledge, the research participants can provide inputs to the system analyst for updating the system. This finding, in turn, substantiates the previous findings. To complement the story of the impact of the programme amongst respondents, the following subsection describes the impact of the programme on the respondents from the IS department.

Information Systems Department

As mentioned in Chapter 5, there is one systems officer, who is responsible for updating and managing the CMMS in each of the maintenance departments in Perwaja. In total, eight systems officers participated in this study. However, the systems officers are responsible to the IS department and not to the maintenance departments. The systems officers involved with this research are as follows: (1) Mr. Amran (CMMS – instrumentation); (2) Mr. Zaini (CMMS – mechanical services); (3) Mr. Zainal (CMMS – water); (4) Mr. Mohd Yazi (CMMS – electrical); (5) Mr. Ishak (CMMS – crane); (6) Mr. Anuar (CMMS – maintenance planning); (7) Mr. Azmi M (CMMS – maintenance solutions) and (8) Mr. Fakhrurazi (CMMS – utilities).

According to Mr. Amran, the programme increased his strength and willingness to interact with others. Before the programme he was quite shy. The researcher established this by considering his personality. Furthermore, the researcher had to interrupt conversations by encouraging Mr. Amran to express his experiences after the programme. After the programme, it seemed to the researcher that he was able to reduce his shyness when communicating with others. The following statement strengthens this scenario: "On returning from the programme, I became confident and had a strong desire to interact with my colleagues. I worked harder to maintain this spirit. It would be a big loss if I did not practise the elements that I learnt in the programme." In short, the impact of the programme on Mr. Amran was on the development of cognitive skills and self-knowledge. Through these values and communicating platform, Mr. Amran was able to effectively gather ideas, views and actions (inputs) for a continuous development of IS. It is argued that communicating with the user is critical in the IS world, since it provides a platform to gain feedback or inputs for the continuous IS re-examination and modification.

Contrastingly, the impact of the programme on Mr. Zaini was twofold. First, the programme increased his ability to prioritise tasks, such as prioritising machine-related tasks over others. Second, the programme increased Mr. Zaini's personal confidence. In this case, he gained strength to communicate with colleagues and superiors. Furthermore, he said that being equipped with these two values enabled him to meet the users more frequently, to gather inputs for the maintenance planning and recording. This was evident from this statement: "In the workplace, there are two important values, which are priority and personal interest. In this case, I should know which one should be undertaken first or

postponed… Overall, the course gave me personal confidence in handling the tasks and staff in my unit. I do reckon that, without this value, it would be hard to organise tasks and staff properly." In short, the impact of the programme on Mr. Zaini was from the internal strength development to communicate with CMMS's users in the workplace. These activities, in turn, illustrated Mr. Zaini's willingness to continuously update the contents of the system. Due to the updated content, that type of IS can assist in promoting OL.

From Mr. Zainal's point of view, the course was beneficial for the decision making process (similar to the view of Mr. Mohd Adi). This was based on this statement: "This course gave guidance to me on how to solve problems and motivation to do work effectively. It also made me more confident in accomplishing tasks and sharing ideas in meetings." In addition, he observed that the course refreshed his memory towards the virtuous values that are critical to be adapted in the workplace. All these contributed in a significant way to organisational development. In short, the impact of the programme on Mr. Zainal was on the development of cognitive skills and personal drive. These values, in turn, illustrated Mr. Zainal's abilities to actively gain feedback or inputs for a continuous re-examination and modification of IS through the medium of discussion. Due to the updated content, that type of IS can assist in promoting OL.

For Mr. Mohd Yazi, the course improved his self-discipline and objectivity to contribute to Perwaja's development. As mentioned, "The course taught me that, for a task, trust should be fulfilled. This value resulted in an internal strength to work hard in achieving a target, although sometimes the results are not as expected. The most important thing is a sense of responsibility to work hard in assisting the company in achieving its goals… my self-discipline was improved in a significant way. For example, I would come to the office early and organise files better. Before this, I thought that my position was good enough and therefore reduced my willingness to change. But now, whenever my idea is rejected, I investigate the reason behind that and improve accordingly…" In short, the impact of the programme on Mr. Mohd Yazi was from the internal strength development to face difficulties and pressures in the workplace – emotional resilience and personal drive. In turn, this development enabled Mr. Mohd Yazi to actively gain feedback or inputs from the users. It is suggested that being equipped with this ability enables Mr. Mohd Yazi to effectively update the contents of CMMS.

The programme has had a great impact on Mr. Ishak's ability to undertake tasks in a collective manner. He said, "First and foremost, my personal confidence was increased. After the programme, I was really confident in performing the best for the company. The programme also increased my sense of responsibility and sincerity in assisting the company to achieve its goals. As a result, my colleagues felt more confident in me." In short, the impact of the programme on Mr. Ishak was on the development of emotional resilience and personal drive. Being equipped with this value, Mr. Ishak was able to experience many improvements in the daily activities. These values allow Mr. Ishak the personal robustness to fulfil users' needs and manage challenges healthily. This, in turn, enabled Mr. Ishak to continuously update the contents of CMMS.

On the other hand, Mr. Anuar experienced a great improvement in the emotional resilience value after the course. He observed that, "The programme had developed my internal and external strengths to face difficulties and stressful situations in the company. Everything begins with emotional resilience. If we look at negative things from the positive side, it will become positive from our side. I stressed the importance of emotional resilience to my colleagues after the course. From my personal observation, all the participants had showed similar changes in their commitment and willingness to develop the company. They became less grumpy in the workplace." The emotional resilience, in turn, enabled Mr. Anuar to fulfil the users' needs smoothly and effectively. The interesting point in his statement was the testimonial that he made regarding the success of the programme in developing the ability to control emotions amongst participants. In short, the development of emotional resilience enabled Mr. Anuar to continuously update the contents of CMMS.

Mr. Azmi gained the ability to talk to or communicate with others in the department from the programme. Before the programme, it was hard for him to express the feeling of inability to undertake a given task. This resulted in a great pressure on him in the workplace. However, after the programme, he said that "The overall impact from the programme was that I became confident when communicating with everybody in my department. If I felt that I could not do one task, I expressed it by talking to the boss and giving my suggestion to overcome it. Before this, I was so afraid to admit my weaknesses, due to my shy and inferior feelings. But right now I feel confident enough in expressing my feelings and confronting my boss." The pressure due to the inability to undertake tasks

is normal in the IS profession. However, the attendance on the programme enabled Mr. Azmi to manage the pressure smoothly – emotional resilience. In other words, through good relationships and communications, Mr. Azmi was able to actively gain feedback or inputs for a continuous re-examination and modification of IS.

From Mr. Fakhrurazi's perspective, the programme strengthened his capability to tackle the human-related issues in the workplace. This was evident from this statement: "On returning from the programme, I was able to control my feelings and think more effectively. As a result, I would not easily jump to conclusions. I would evaluate an issue thoroughly and discuss it with my colleagues or staff before a final decision was made." In other words, the programme enabled Mr. Fakhrurazi to be objective in the workplace – emotional resilience. According to him, the most important things in the working life are the targets and efforts to achieve them. Being equipped with these abilities, Mr. Fakhrurazi was able to determine when and how to utilise his knowledge when facing problems. This resulted in Mr. Fakhrurazi actively obtaining clarification and sharing ideas with others in order to continuously update the contents of CMMS.

To recapitulate, the programme made a significant impact upon the respondents from the information systems department. Therefore, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are capable of developing participants' ability to control emotions, relationship with others and a sense of responsibility to develop Perwaja. In other words, the participants experienced a profound development of meta-abilities. These elements motivated the participants to gain feedback or inputs for a continuous re-examination and modification of IS. This scenario illustrated that the participants gained strength to actively update the contents of CMMS. This finding is parallel to the finding of the previous departments.

Whilst the aforementioned subsections discussed the impact of the programme on the respondents' activities, the next subsection will develop the meaning of the stories by utilising the hermeneutic interpretation.

6.4.2 Hermeneutic Interpretation – Developing Meaning

The hermeneutic interpretation intends to appreciate what has been understood and learnt through writing a story (interpretation) and trying to present the entire narrative

through its parts. This involves identifying clusters of significant statements in relation to the impact of the programme on the development of the seven competency sets and, in turn, its impact on tacit knowledge externalisation. The outcome is to discover what is being meant, learnt or misunderstood, and then verified with the respondents. A questioning process is paramount before and during the guided conversations, reading the transcription of the audio recording and during the writing of respondents' stories. Questions included: "What am I learning from them?", "What do they mean, what are they trying to say?", "What are my prejudices in my learning/interpretation?", "How do their stories help me to understand the seven competency sets, tacit knowledge externalisation and OL better?", "Do the themes I have developed reflect the seven competency sets, tacit knowledge externalisation and OL?", "What is still puzzling me?"

As these questions were considered, certain phrases became obvious from the text and offered some answers. The first elements that need to be understood are the development of meta-abilities. Therefore, the questions that were posed included: "Could you please share with me the impact of the learning that you gained after the programme? Are you able to experience the development of cognitive skills? What is the level of self-knowledge after the programme? How about the impact of the programme on emotional resilience? What is the impact of the programme on the development of personal drive?" For every meta-ability's term, the definition and examples were provided.

The responses from the research participants were tape-recorded. The researcher then transcribed the audio-taped information and transformed them into text. As part of the hermeneutic analysis, the researcher then elicited the significant statements that can be detected from the text. For illustrative purposes, this dissertation illustrates the significant statements that were elicited from the text of Mr. Abdul Rahim. The text is as follows:

> This programme increased my confidence in communicating with my subordinates or superiors. I set in my mind that everything that I did was my duty and therefore it is my responsibility to accomplish it for the sake of Perwaja. I should not become arrogant, annoyed and sensitive to any instruction if it has been agreed in the meeting or is beneficial to my staff and company.

The significant statements of the above text are as follows: (1) solve problems collectively and (2) receptive to any ideas. The summary of the significant statements of

the respondents is illustrated in the column cognitive skills, self-knowledge, emotional resilience and personal drive of Appendix F.

The themes illustrated in Appendix F show that the respondents experienced significant developments in their meta-abilities. These findings, in turn, show that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are relevant to develop meta-abilities. From these findings, it can be said that the foundation of this research, conceptual framework, has been successfully established (stages A and B of Figure 5.1). This result validates the first proposition of this research: There is a significant influence of organisational roles, internal strengths, formal and informal discussion and rational discourse on the respondents' level of meta-abilities (as defined and described in Section 2.7). The question that could be raised from these findings is "What are the impacts of these changes?"

For the purpose of this research, the impact and development of meta-abilities will be linked to influencing skills, sharing attitudes and inquisitive tendencies activities. This is due to the development of meta-abilities that resulted in individuals implementing significant change within their organisations (Butcher *et al.*, 1997). These changes range from introducing specific initiatives to realigning the culture and values of the organisation. Significantly, these changes are individually driven, at times fragmented actions, which succeed in creating subcultures, demonstrating new approaches and influencing attitudes within the organisation. They are underpinned, not by corporate control or widespread campaigns, but by an understanding of the complexity and political nature of the organisational influencing process. Above all, they are driven by individual beliefs, commitment, enthusiasm and perseverance. Implicit in these phenomena are the existence of an individual's strength, confidence and a sense of responsibility and belonging to develop the company in an active manner. These values, in turn, encourage individuals to influence, ask and share ideas with others within the company.

This approach is similar to Butcher *et al.* (1997) whereby they link the development of meta-abilities with influencing skills. Therefore, after being questioned about post-training meta-abilities, respondents were asked about their impact on the post-training influencing skills, sharing attitudes and inquisitive tendencies. Questions included: "What can you say about the level of influencing skills after the programme? How do meta-abilities assist you in improving influencing skills? Do you experience an

improvement in the sharing attitudes after the programme? What is the role of meta-abilities in improving your sharing attitudes? How about the level of inquisitive tendencies after the programme? Do meta-abilities play an important role in developing your inquisitive tendencies?"

The responses from the research participants were tape-recorded. The researcher then transcribed the audio-taped information and transformed them into text. As part of the hermeneutic analysis, the researcher then elicited the significant statements that can be detected from the text. In the case of Mr. Abdul Rahim, the following text was obtained:

> The course has changed my behaviour from timid to friendly. Before this I was not very sociable. After delegating the tasks to my subordinates, I would concentrate on my own work. But after the course I always met my subordinates to ask about work progress, problems and internal feeling due to heavy work burdens. In addition, I became confident in facing my colleagues in the meeting and expressed my views if necessary.

The significant statements of the above text are as follows: (1) gain confidence to undertake formal or informal discussion with others and (2) gain knowledge to improve skills. The summary of the significant statements of the respondents is illustrated in the column influencing skills, sharing attitudes and inquisitive tendencies of Appendix G. Once these significant statements were identified, the researcher developed the generic themes that represent all the significant statements. In this case, the researcher determined the common concepts that were shared by influencing skills, sharing attitudes and inquisitive tendencies. This theme is termed as the first level theme (Clarke, 1999). This was because this research intended to further examine the validity of the first level theme by using a second conversation.

From the significant statements in the column influencing skills, sharing attitudes and inquisitive tendencies (Appendix G), it is argued that the respondents experienced significant impacts of meta-abilities on influencing skills, sharing attitudes and inquisitive tendencies. This result illustrates that meta-abilities are closely related to influencing skills, sharing attitudes and inquisitive tendencies. These results, in turn, validate the following propositions of this research:

- There is a significant influence of meta-abilities on the respondents' level of influencing skills

- There is a significant influence of meta-abilities on the respondents' level of sharing attitudes
- There is a significant influence of meta-abilities on the respondents' level of inquisitive tendencies.

The close relationship between meta-abilities and the elements of influencing skills, sharing attitudes and inquisitive tendencies, in turn, illustrate that stages A, B, C, D and E of this research conceptual framework has been achieved (refer to Figure 5.1 of Section 5.7 for details).

The interpreted themes (first level theme column of Appendix G) are activities that enable the externalisation of tacit knowledge through the medium of ideas, actions, reactions and reflections. However, the validity of the interpreted themes is questionable, since the respondents' actions would be contrary to the researcher's behaviour or prejudices. This broadened the researcher's experience and understanding of a respondent's approach to such tacit knowledge externalisation. This dissonance challenged the researcher into trying to "find common sense between the strange and the familiar" (Weinsheimer, 1985, p. 184). If the researcher encountered meanings that are outside his known prejudice, then he needs to question these meanings and his prejudices to deepen his understanding to widen "one's own horizon so that it can integrate the other" (Bleicher, 1980, p. 112). The researcher needed to further discuss this first level with the respondents during the second conversation, in order to confirm the interpretation through his expanded horizons.

6.4.3 Learning through Dialogue

Returning to the respondents for the second conversation enabled further dialogue to question the first level themes (first level theme column of Appendix G). These themes were still specific to each respondent and had not yet been aggregated or clustered with the other individuals. This dialogical process in hermeneutic research would usually be between interpreter and text but the theoretical justification for returning to the participant is offered by Bleicher (1980). He states that in the dialogical process, "the concepts used by the Other, be it a text or a thou, are regained by being contained within the interpreter's comprehension. In understanding the question posed by the text we have already posed

questions ourselves and, therefore, open up possibilities of meaning" (Bleicher, 1980, p. 144).

Therefore, the first level themes can be viewed as questions about the seven competency sets, which the researcher believes are helping to understand the externalisation and sharing of tacit knowledge. Verifying these themes with the respondents allowed for confirmation of meaning or refutation and dialogue for a further possible meaning to be agreed. Usually the researcher returned to the respondents within a three-week period in order to enable transcriptions of the conversation, to send a copy of the transcript for the respondents (through Perwaja's Human Resource Division), to develop questions and construct first level themes for discussion at the second meeting.

To summarise, the aim of the second set of questions was the researcher's exploration of the first level themes in the context of the following questions: "This is what I am understanding, can I confirm this with you? This is what I have learnt about influencing skills, sharing attitudes and inquisitive tendencies from you, can I determine whether this is what you meant? Can you identify the meaning behind this theme as explaining ideas/actions/reactions/reflections expression, there may be multiple realities from the language of the respondents, is expressing ideas/actions/reactions/reflections the key process in this theme? Does something else arise?" The content and context of an extract from a second conversation follows.

Extract from the Second Guided Conversation with Respondents

Four weeks later, the second conversations took place. As usual, the training officers at both research sites had an important role in arranging the meeting with the respondents. The same rooms in the research sites were used to undertake the second conversation. This meeting, in comparison to previous ones, was a more intimate affair. In this case, the researcher and participants had sessions consisting of laughter, humour, a friendly manner and open-mindedness. At one point, some of the respondents made a cup of coffee, which did not occur in the first meeting. However, the researcher maintained the structured methodology that is described in Chapter 3 to ensure that the important information is not lost.

The respondents had read the first transcript of our conversation and agreed with its accuracy, which was an important point due to the challenges posed in the transcribing.

The researcher offered the respondents a synopsis of the first level themes he had developed. The respondents expressed their thoughts verbally in order to confirm or refute the themes.

The researcher checked whether the respondents had been "externalising tacit knowledge" in the workplace. This was undertaken by asking the research participants whether they gained strength from actively expressing ideas or views in the workplace. From the feedback, it was evident that the respondents experienced a significant improvement in the ability to externalise their tacit knowledge actively through the medium of ideas, actions, reactions and reflections.

For illustrative purposes, this dissertation illustrates the process that was undertaken on Mr. Abdul Rahim. As noted in the column 'First Level Themes' of Appendix G, it was found that Mr. Abdul Rahim had been "highlighting issues in the formal or informal discussions" and had experienced "interacting with staff to develop them and the unit;" both to colleagues and staff. In this case, as mentioned in the subsection Maintenance Solutions Department, Mr. Abdul Rahim said that, after the course, he always met his subordinates to ask about work progress, problems and internal feelings, due to heavy work burdens. Mr. Abdul Rahim agreed that he was highlighting these issues in the meeting and interacting with staff for unit development. He elaborated that it was a significant impact that he gained from the discussion in the research programme. In suggesting that he was trying to externalise the ideas, both of us were able to fuse our horizons of understanding. This led to several first level themes merging into one second level theme of "becoming confident enough to express ideas." The approach that was utilised to determine the second level theme with Mr. Abdul Rahim was utilised with the other respondents as well. This was because Mr. Abdul Rahim was the first research participant that the researcher met.

In every case, the researcher and respondents discussed the first level themes, which arose from the respondents' text. Then the two groups met in similar situations where the respondents could determine how the interpreted themes had been arrived at, although they had not always reflected on them in that way. For example, Mr. Abdul Rahim's horizon of understanding was heightened in the researcher's interpretation of his actions in interacting with staff without hesitation. The tentative theme was "Interact with staff to develop them and the unit." He had stated that "I set in my mind that everything

that I did was my duty and therefore it is my responsibility to accomplish it for the sake of Perwaja. I should not become so arrogant, annoyed and sensitive to any instruction if it has been agreed in the meeting or is beneficial to my staff and company." In other words, Mr. Abdul Rahim did not want the unit "to face havoc in the operation" and he considered the staff would not be able to "work in a conducive environment." As a result, he had "forced himself to talk to others" and had "given instructions as to what approach should be applied." By comparing the researcher's interpretation with the participant's statement, it can be learnt that both of them were able to fuse their horizons of understanding. Therefore, the researcher's interpretation was able to be verified from the second meeting.

Upon questioning of the respondents' actions, it was concluded from the researcher's point of view that, if a similar situation had occurred, the researcher would be forced to interact with others and utilise the best approach to undertake a task. These actions, in turn, enable the individual to actively externalise ideas in the workplace. For example, Mr. Abdul Rahim's action of interacting with others in the unit suggested to the researcher that he was externalising his ideas for the sake of Perwaja's development.

Whilst this action described the extract from the second guided conversation with the respondents (through one example), the next subsection will cluster the themes into the constructed individual categories.

6.4.4 Construction

Once the individual second level themes were established through dialogue, the next stage was to decide what themes could be clustered to construct individual categories. In the search for categories, however, Frank (1997, p. 85) suggests that "categories are not an end in themselves" and aid the willingness of the researcher to "stay tuned" to the respondents and to "observe how they adapt and transform new situations, reinventing the meaning of their activities and lives." The second conversation served to assist this process.

From the aforementioned discussion, it can be learnt that the researcher and respondents discussed the first level themes, which arose from the respondents' text. As being practised in the first interview, the responses from the participants were tape-recorded. The researcher then transcribed the audio-taped information and transformed them into text. The researcher then elicited the significant statements that can be detected

from the second conversation text. The summary of the significant statements of the respondents is illustrated in the column second level themes of Appendix H. Once the second level themes were identified, the researcher developed the generic themes that represent the first and second level themes. In this case, the researcher identified the common concepts that were shared by both themes. This type of generic theme is termed as an individual category (Clarke, 1999). This is because the developed generic themes represent the themes for a research participant. The individual category for every research participant is illustrated in the column individual category of Appendix H.

Individual categories were completed for all 39 respondents and then examined collectively to construct three main categories. This process is illustrated in Appendix I.

From Appendix I, it is shown that there are three constructed major categories, which are as follows: (1) the confidence to express ideas; (2) the ability to determine and define actions and reactions and (3) the ability to reflect a problem. From the constructed three major categories, it can be learnt that the respondents were able to externalise and share their tacit knowledge through the medium of ideas, actions, reactions and reflections. These results, in turn, validate the following propositions of this research:

- There is a significant influence of influencing skills, sharing attitudes and inquisitive tendencies in externalising respondents' ideas.
- There is a significant influence of influencing skills, sharing attitudes and inquisitive tendencies in creating respondents' actions and reactions.
- There is a significant influence of influencing skills, sharing attitudes and inquisitive tendencies in creating respondents' reflections.

The close relationship between the elements of influencing skills, sharing attitudes and inquisitive tendencies and the formation of ideas, actions, reactions and reflections illustrates that Stage F of this research conceptual framework has been achieved (refer to Figure 5.1 of Section 5.7 for details). This finding shows that the linear relationship between stages A, B, C, D, E and F of the conceptual framework can be obtained in practical situations.

6.5 Documentation and Codification

The above results of ideas, actions, reactions and reflections formulation represent the ability of the participants to externalise and share their tacit knowledge effectively.

Implicit in this was that the seven competency sets did provide a platform to the participants to externalise their tacit knowledge in a creative and spontaneous manner. At this point, there is a need to visit Stage G of the conceptual framework that is the documentation of ideas, actions, reactions and reflections (refer to Figure 5.1 of Section 5.7 for details). This is because, without being documented, it is hard for the systems officer to remember the ideas that are given by the staff members. In this case, there is a high tendency that the systems officer will forget what others have shared with him/her. However, by being documented, the systems officer can put the written ideas in the temporary file before they are embedded in the system database.

To understand the scenario of self-documentation in this research, the following question was posed to the respondents: "What is your comment on the idea of documenting the externalised ideas/actions/reactions/reflection?" The obtained responses are summarised in Appendix J.

Appendix J shows that all the respondents agreed with the idea of documenting the externalised tacit knowledge. This result shows that Stage G of this research conceptual framework can be obtained within practical situations. Thus, the final proposition of this research is substantiated. Majority of the respondents believed in self-documentation rather than a knowledge steward. A knowledge steward is a person who is responsible for obtaining ideas from the staff members. However, this finding does not affect this research because the concepts of using a knowledge steward and self-documentation can be used in different contexts. Self-documentation is more appropriate in daily activities because they require staff members to use their knowledge in a spontaneous manner. In this case, after experiencing something new, the staff members write down that experience in the notebook. Contrastingly, a knowledge steward is more appropriate for a formal meeting where knowledge stewards interview staff members to obtain their ideas on certain issues. In short, the results in Appendix J show that the development of meta-abilities result in a willingness to document tacit knowledge amongst respondents.

After discussing the issue of knowledge documentation with respondents, the issue of knowledge codification was then highlighted (stages H and I of Figure 5.1) to CMMS system officers. This was because system officers are the people who are responsible for codifying inputs into the CMMS. All system officers who participated in this research felt that there was a significant improvement in the motivation to update the contents of the

maintenance record. According to them, this was achieved through the strength to meet users and obtain necessary inputs for recording purposes. When relating this issue to IS development, all the system officers agreed that there could be a basis for establishing learning-oriented information. In this case, there was a close relationship between the documentation of the externalised tacit knowledge with the continuous re-examination and modification of IS contents. It is argued that this type of IS content is capable of promoting learning. These scenarios show that stages J and tacit knowledge development of this research conceptual framework are applicable in practical situations.

6.6 Summary

From the aforementioned discussion, it can be learnt that the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse assist in developing meta-abilities. Meta-abilities, in turn, assist in building a capable, confident and responsible individual who can face the difficulties of externalising and sharing tacit knowledge and obtaining opinions from colleagues through three humanistic elements. First, meta-abilities create individual influencing skills. Second, meta-abilities develop individual sharing attitudes. Finally, meta-abilities develop an individual's strength in acquiring opinions from other staff members. By practicing these influencing skills, sharing attitudes and questioning attributes individuals generate ideas, actions, reactions and reflections. The terms "ideas", "actions", "reactions" and "reflections" represent forms of activities within an organisation. Documenting this externalised and shared tacit knowledge can develop synergistic inputs for a continuous development of IS. Due to the updated content, that type of IS can assist in promoting OL. The whole process of this is conceptualised in a framework. The findings of this research, as discussed above, validate the fact that this research conceptual framework is obtainable in the practical situations.

Having validated the framework but not its applicability in the real life setting, the next chapter will implicate the framework with the practical situations.

7 CHAPTER SEVEN: Review, Summary and Conclusions

7.1 Introduction

This chapter concludes the results and findings of the research presented in this dissertation. Before highlighting the conclusions of this research, the definitions and descriptions of this research's conceptual framework are revisited. This is followed by descriptions of the conclusions of this research. Thereafter, a discussion of the research contributions and achievements, in terms of the underlying disciplines and subject areas, is undertaken. Following this is a review of the future directions of the research findings.

7.2 Review of the Conceptual Framework

The conceptual framework discussed earlier highlights the important role of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse in developing an individual's meta-abilities. This development, in turn, is important in preparing individuals for OL-based IS development. In other words, the framework consists of two major components which are as follows: (1) individual

development and (2) learning-based system development. In short, the framework tries to motivate individual participation in the OL-based IS development process. As noted in chapters 1 and 2, the driving factor for this strategy is attributable to the knowledge and skills that individuals have. Nowadays, change management approaches, such as BPR and TQM, place more emphasis on human capital development for future competitive advantage and also spur the need to have such a framework (Burnes, 2004).

The conceptual framework for this research that was developed after a pilot and case study were undertaken is illustrated in Figure 5.1. The diagram illustrates that there are ten stages in the framework: (1) individual development; (2) meta-abilities; (3) influencing skills; (4) sharing attitudes; (5) inquisitive tendencies; (6) I-A-R-R continuum; (7) knowledge documentation; (8) system analysts (coding); (9) system database; and (10) information distribution. These stages involve both individual and technical reactions to change during the IS development process. The previous OL theoretical frameworks do not include the elements of individual development, meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies, and this makes this research contribution unique.

The way that the framework operates is as follows. The need for knowledge application is triggered by situational problems faced by an organisation or individual. This can occur as a result of internal or external pressures. External pressures can be economical and political issues as well as changing technology. Examples of internal pressures include information flow, human resources, organisational power, politics and culture. Those who are not confident in solving problems will resist solutions; thereby preferring to become the implementers of instructions or asserting that the problem is not significant. This, in turn, highlights the fact that the assumptions that were made by the previous OL theories of individuals participating actively in IS development is unobtainable in practical situations.

The findings of this research illustrate that, being equipped with an understanding of the organisational roles, internal strengths, formal and informal discussion and rational discourse enables individuals to have strong meta-abilities. The development of meta-abilities results in the development of influencing skills, sharing attitudes and inquisitive tendencies. This is possible because meta-abilities build positive characteristics when using tacit knowledge (such as high levels of confidence, willingness, resilience, good judgement and being motivated by strong feelings). These positive characteristics, in turn, develop

staff members' learning capabilities and help them to externalise their tacit knowledge through the medium of ideas, actions, reactions and reflections. Documenting this I-A-R-R continuum can provide inputs to the system officer when updating the contents of the IS.

The role of a systems analyst is to study the documented inputs provided by the staff members or knowledge stewards. This is followed by a codification process. By the time the inputs are transformed into a codified domain within the systems, they become information. Organisational members can obtain access to this information to undertake daily activities or to solve problems by using ICTs, such as a local area network, internet and intranet. ICTs are utilised because they provide computerised facilities and an infrastructure to process and disseminate information at a high speed. The dissemination of information within an organisation can enrich an individual's understanding of an organisation's activities (tacit knowledge development) and eventually provide a continuous I-A-R-R feedback for continuous IS re-examination and modification processes.

To recapitulate, the whole process of the conceptual framework developed in this research can promote learning in an organisation. This learning, in turn, reveals that one's knowledge or expertise can be disseminated and diffused within an organisation. The conceptual framework illustrates a cycle to continuously re-examine and modify an IS. This is due to continuous inputs from the staff members, which are in the form of documented I-A-R-R continuum. By being continuously updated, the IS can assist staff members in obtaining the right information for the right problem.

Whilst this section revisits this research conceptual framework, the next section will conclude the results and findings of the research presented in this dissertation.

7.3 Conclusions

The research questions of this dissertation are as follows: "How do we include individuals in the learning-based systems development? Why use meta-abilities in order to include individuals in the learning-based systems development?" In other words, this research has attempted to recognise and capitalise on the critical role that individual development plays in OL-based IS development. To achieve the aim of studying the elements that can encourage staff members to contribute inputs for learning-based systems development, this research developed a conceptual framework based on the concepts of

meta-abilities and tacit knowledge externalisation and sharing. Meta-abilities, in turn, are developed by using the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. To enable validation of the above research issues, an in-depth, longitudinal case study and a pilot were presented.

From the undertaken research it was found that the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse enabled the development of meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies. These abilities, in turn, improved the participants' responsibility and awareness to externalise and share their tacit knowledge effectively. By documenting the externalised and shared tacit knowledge, the research participants can provide inputs to the system analyst for updating the system (Choudrie and Selamat, 2004). Continuously updating the current "company norm," such systems are expected to prevent the core capabilities of yesterday from becoming the core rigidities of tomorrow. In short, an active involvement of staff members in contributing views or ideas enables the contents of organisational IS, such as maintenance management, accounting and finance, quality management, multiple-level production and human resource systems subject to continual re-examination and modification given a changing environment. Being continuously updated, it is argued that the systems can promote learning because staff members can gain new insights in performing tasks (ibid). These findings illustrate that the research questions of this research has been successfully answered. Therefore, the main focus of this research for IS should be towards an individual's meta-abilities development that develops a willingness to contribute views or ideas that further update the IS contents continuously.

Contrastingly, it can also be learnt that individual development is important for OL-based IS. This is due to the process of learning occurring in a human being's mindset, which if not well developed can become extinct and subsequently of no use to the organisation. Therefore, staff members should be instilled with the elements that can motivate and increase a sense of responsibility amongst them to learn new organisational approaches and to provide inputs to the system analyst for updating the system. Being continuously updated, it is argued that the systems can promote learning because staff members can gain new insights in performing tasks (Choudrie and Selamat, 2004). In other words, to establish an effective learning system and environment within an organisation, the participation from staff members is necessary and has to increase. From this discussion,

it is suggested that individual development should become the starting point for any OL-based IS development.

Another driving factor behind the need to continuously re-examine and modify the system is the fact that tacit knowledge remains the property of a human being. Such knowledge is lost when staff members leave the organisation. As a result, the involved organisations have to "reinvent the wheel." Additionally, it is also possible that some executives may be operating their organisations based on inadequate or obsolete knowledge when knowledge is not shared across the organisation. Therefore, the staff members should be encouraged to contribute views or ideas to continuously update the IS contents.

The findings of this research also indicate that the training programme that is undertaken outside a working site, such as training centres, has a much more important role in developing individuals. This is because a high level of concentration enables the participants to fully understand the elements that are discussed in the programme. Such training programmes are capable of providing a unique environment in which individual development, as OL-based IS development, can be the focus.

To recapitulate, top down, corporate wide OL-based IS development is becoming less consistent with contemporary organisational forms. The requirement on staff members to deal effectively with more complex organisations and environments places a greater premium on individual contribution, which in turn relies on individual development. This strongly implies that individual development is becoming a more appropriate starting point for OL-based IS development.

7.4 Contributions of this Research

It has been concluded that this research offers a contribution to research by developing a novel framework. In the following subsections the added benefits of this research are emphasised and discussed hereafter.

7.4.1 Contributions to Academia

There is a growing realisation that often human issues are a substantial, if not the primary, factors for IS failure (Eason, 1988; Buchanan, 1991; Ewusi-Mensah and Przasnyski, 1994; Doherty and King, 1998; Tsoukas, 2002; Malhotra, 2004). The main

reason for this occurrence is that forces in the contemporary business environment and the consequent emergence of new organisational forms develop an individuals' self-conscious to re-order, to re-arrange and to redesign an IS (Bell, 1999). In other words rapid changes in the environment will transform an organisational members' knowledge and as a consequence change their perception and judgement on the role of IS. This research proposes possible solutions for those human issues, such as anxiety, lack of confidence and unwillingness to participate in a continuous development of IS by proposing the elements of understanding organisational roles, internal strengths, formal and informal discussions and rational discourse. It is suggested that these elements can motivate and increase a sense of responsibility amongst staff members to participate in the organisational IS development. The participation of the human aspects allows ideas and suggestions (input) to continuously re-examine and modify the system. An example of this could be a situation where a manager in the Maintenance Department is interested in determining the cost-effectiveness of introducing a new maintenance schedule. In this example, the manager will utilise his/her previous experiences in appraising the machine conditions, spare parts and technicians. Based on this understanding, the scheduling system is updated. Nevertheless, to complete that task, the manager must have the willingness to externalise previous experiences, have a meeting with engineers and technicians, consult the experts, obtain additional information from colleagues or share the strategy with the system officer. It is suggested that being equipped with meta-abilities enables maintenance manager, engineers and technicians to actively provide ideas or views (inputs) for a continuous re-examination and modification of maintenance scheduling system.

In most of the research undertaken on OL, there have been investigations into frameworks that enhance the exchange and sharing of tacit and explicit knowledge (Senge, 1990; Huber, 1991; DiBella, 1995; Malhotra, 1997; Davenport *et al.*, 1998; Klimecki and Lassleben, 1998; Meso and Smith, 2000; Liu *et al.*, 2004). The emphasis in these cases has been on determining the technical perspective of the OL or tracing the roots of OL, thus resulting in fewer empirical results that support these frameworks. In addition, it is always presumed that organisational members are able to externalise and share their tacit knowledge effectively, which is not always the case in real life situations. This research offers a contribution in that it is examining a topic that has not been extensively discussed in the area, which are the elements that can encourage staff members to contribute inputs for learning-based systems development. As noted above, the proposed elements are as

follows: (1) understanding organisational roles; (2) internal strengths; (3) formal and informal discussions; (4) rational discourse; (5) meta-abilities; (6) influencing skills; (7) sharing attitudes; and (8) inquisitive tendencies. It is suggested that being equipped with these elements enables staff members to provide ideas or views (inputs) for a continuous re-examination and modification of IS. The system officers study the inputs provided by staff members and codify them. By the time the inputs are transformed into codified domains within the IS, they become information for assisting staff members in fulfilling their responsibility. By obtaining new information, staff members are able to identify a work progress, to access to new working approaches, and ultimately internalising them. At this stage, staff members can improve their actions through better knowledge and consequently can undertake their tasks effectively – the learning process. In other words, this research proposes the elements that improve the process of externalisation, internalisation and sharing which is critical in the learning process. This will allow organisations that are developing OL-based IS to promote learning to determine whether they are following the same or different path, or to draw an organisation's attention to some of the identified theoretical and empirical results. This premise in turn enables organisations to minimise the risk of failing to gain returns from the investments on OL-based IS projects.

The elements of understanding organisational roles, internal strengths, formal and informal discussions, rational discourse, meta-abilities, influencing skills, sharing attitudes and inquisitive tendencies can also be used to assist organisations to harness their staff members' expertise in the system. This is due to the fact that tacit knowledge remains the property of a human being (Tsoukas, 2002). Such knowledge is lost when staff members leave the organisation. It is suggested that being equipped with these elements enables staff members to provide ideas or views (inputs) for a continuous re-examination and modification of IS. Through this process, the organisations can establish an effective knowledge management system and can solve the problem of "reinventing the wheel."

7.4.2 Contributions to Industry

By studying the competencies enabling the externalisation and sharing of tacit knowledge, a contribution to practice is also achieved. By utilising the elements of understanding organisational roles, internal strengths, formal and informal discussion, rational discourse and communicating with the participants for their meta-abilities

development, this research identifies that practitioners are offered an approach and elements that should be considered in their attempt of adapting "individual development as the starting point to organisational development." This allows the research to present a rich picture of the competencies enabling the externalisation and sharing of tacit knowledge, in particular, and OL in general. This alternative is something that most of the previous research in OL and knowledge management has not touched upon (discussed in Section 2.4) and adds a new dimension to research in the OL and knowledge management areas. As previously mentioned, the OL area has had a high rate of failure (Malhotra, 2004), and one of the contributing factors leading to this rate is the competency to externalise and share the tacit knowledge area. Thus, practitioners should find this research helpful.

Industry can also benefit from the training approaches that were utilised in this research. When conducting the case study for this research, a training programme was established. The following discussion exhibits its benefit. It is important for a training officer in the Human Resources Department to interact actively with the participants during the training programme. In this case, the training officer should allow the participants to express their views, ideas, beliefs and perception on a discussed issue. All the ideas or problems that are expressed by the participants should be noted and opened to other participants for discussion. This strategy enables the participants to reflect upon the others' mistakes or problems and learn from those mistakes or problem. Nevertheless, at the end of the session the trainer should provide one best approach in tackling that problem effectively.

This research also provides an organisation with a platform that can reduce the dependency on the material rewards in motivating staff members. By saving money, one company can be prepared for any fluctuation in the economy. Therefore, organisations should examine the humanistic elements that can make their staff members aware of the organisational responsibility. The humanistic elements that are developed in this research can assist organisations in this process. An active involvement of staff members in the daily operations can contribute to performance improvement. This is because individuals are the backbone of any organisation in this world.

7.5 Limitations and Future Research

Having obtained a view of the contributions, this research will now describe the limitations of this research. As noted in the previous chapters, diffusing and enriching tacit knowledge is not easy. This is due to tacit knowledge being internalised such that it has often become a natural part of peoples' behaviour or their way of thinking (Haldin-Herrgard, 2000; Tsoukas and Vladimirou, 2001). Additionally, factors such as the lack of confidence, anxiety and unwillingness hinder individuals from learning and sharing their tacit knowledge (Harvey and Butcher, 1998). Meta-abilities, a concept that relates to individual development, also suffer from the same problem, which is that they are to be externalised and shared by individuals. However, as this research studies elements that can motivate people to externalise and share knowledge, the problems were resolved by discussing them in the training programme.

Another limitation of this research is that this research could only be undertaken in IS development due to the time restrictions. This limitation can be overcome in the future by extending the contexts to other areas such as, IS effectiveness and managing the human aspects of systems development and implementation. Further areas, where this can be used are issues pertaining to group coordination and communication and managing the impact of information technologies on organisations planning and control strategies, who would also benefit from an understanding of meta-abilities. This is achieved by encouraging people that surround the systems to contribute inputs for the systems development. All these areas have the potential to be introduced with meta-abilities, since they are bound to a human's awareness and willingness for successful implementation. Additionally, the growth of individual meta-abilities enables an understanding of how to intelligently respond to unknown situations and go beyond the established knowledge to create unique interpretations and outcomes.

Finally, this research was undertaken in Malaysia; therefore a limitation is that this research is restricted to a certain context – Malaysia. This includes the elements of culture, faith, perception, values and norms, which are different in that country. In addition, as a developing state, managerial style and business philosophy, it is different to the western companies. For instance, pension schemes, project management and relationships with the government are all issues to contend with. Moreover, as the involvement of government-linked companies in the Malaysian economy is very significant, the business functioning of

Malaysian companies is different. This is because multi-billion government-linked companies do not pose a threat to the economy but huge business opportunities. All these scenarios might influence the way of thinking amongst Malaysian professionals. Therefore, this research should be conducted in different contexts so that the benefits can be diversified.

APPENDIX A

RESEARCH PLANS

PHASE 1
Induction Programme
- Organisational structure
- Business operation
  - Product/services
  - Functional management
- Business development process
  - Strategic planning
  - Implementation process
  - Re-examination process
- Documents review
- Informal discussion
- Digest organisational information systems
  - Information requirements
  - Information processing flows
  - Technological adoption
  - Re-examination and modification process
- Workshop preparation
  - Module
  - Slide
  - Cases
- Set time for meta-abilities ind. prog. with mgmt.

PHASE 2
Meta-Abilities Training Programme
- Formal workshop
  - Presentations
  - Cases discussion
  - Interactive discussion
- Informal meeting and discussion

PHASE 3
Data Collection
- Set time for interview sessions with mgmt.
- Semi-structured interview
- Unstructured interview - informal meeting
- Work-related document review
- Job observation

- represent 2 weeks

APPENDIX B: The Performance of the Meta-Abilities Training Programme

Instructor: Mohamad Hisyam Selamat

Please rate the following statements:

	Unacceptable	Poor	Average	Good	Excellent
The Lecture					
Rate the information in the lecture	1	2	3	4	5
Rate the presentation of this lecture	1	2	3	4	5
Rate the clarity of the lecture	1	2	3	4	5
Rate the level of formality for this lecture	1	2	3	4	5
The Instructor					
How well did the instructor deliver the lecture	1	2	3	4	5
How well did the instructor answer questions	1	2	3	4	5
Rate the instructor communication	1	2	3	4	5
Rate the instructor appearance	1	2	3	4	5
Rate the instructor manners and professionalism	1	2	3	4	5
You, the instructor and the lecture					
Rate your level of understanding this lecture	1	2	3	4	5
Rate your level on concentration during the lecture	1	2	3	4	5
Rate the ability to ask questions	1	2	3	4	5
Rate your benefit from this lecture	1	2	3	4	5

APPENDIX C

The list of top management that have been interviewed in Perwaja

Kuala Lumpur	Number of Interview	Kemaman Plant	Number of Interview	Gurun Plant	Number of interview
Chief Executive Officer	1	General Manager	1	General Manager	1
Director of Operations	1	Direct Reduced Plant Manager	1	Mill Manager – wire rod and beam section	1
Director of Human Resource	4	Steel Melting Shop Manager	1	Mill Manager - nails	1
Director of Engineering Services	1	Finance Manager	1	Finance Manager	1
Director of IS	1	Human Resource Manager	1	Human Resource Manager	1
		Metallurgical Manager	1	Product and Quality Management Manager	1
		IS Manager	1	IS Manager	1
		Product and Marketing Manager	1	Marketing Manager	1
		Materials Management and Warehousing Manager	1	Chief Operating Officer – Maintenance Solutions	1
		Residence Engineer	1	Chief Operating Officer – Utilities	1
		Safety Officer	1	Chief Operating Officer – Industrial Training	2
		Chief Operating Officer - Instrumentation	1		
		Chief Operating Officer – Water	1		
		Chief Operating Officer – Mechanical Services	1		
		Chief Operating Officer – Crane	1		
		Chief Operating Officer – Electrical	1		
		Chief Operating Officer – Maintenance Planning	1		
		Chief Operating Officer – Industrial Training	2		

APPENDIX D

First Interview Questions:

1. What is the impact of the programme on the development of cognitive skills?

2. Are the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are relevant to develop cognitive skills?

3. What is the level of self-knowledge after the programme?

4. Are the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are relevant to develop self-knowledge?

5. How about the impact of the programme on emotional resilience?

6. Are the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are relevant to develop emotional resilience?

7. What is the impact of the programme on the development of personal drive?

8. Are the elements of understanding organisational roles, internal strengths, formal and informal discussion and rational discourse are relevant to develop personal drive?

9. What is the significant impact that you gain from the training programme?

10. What is your perception on other members after the course?

11. What can you say about the level of influencing skills after the programme?

12. Do the elements in the programme enable you to gain influencing skills?

13. How do meta-abilities assist you in improving influencing skills?

14. What are the factors that motivate you to influence other members?

15. What are the factors that inhibit you from influencing other members, if any?

16. Do you experience an improvement in the sharing attitudes after the programme?

17. Do the elements in the programme enable you to gain sharing attitudes?

18. What is the role of meta-abilities in improving your sharing attitudes?

19. What are the factors that motivate you to share information with other members?

20. What are the factors that stop you from sharing information with other members, if any?

21. How about the level of inquisitive tendencies after the programme?

22. Do the elements in the programme enable you to gain inquisitive tendencies?

23. Do meta-abilities play an important role in developing your inquisitive tendencies?

24. What are the factors that motivate you to ask other members?

25. What are the factors that inhibit you from asking other members, if any?

26. Does anything else that you want to share with me?

Second Interview Questions:

1. This is what I am understanding, can I confirm this with you?

2. This is what I have learnt about influencing skills, sharing attitudes and inquisitive tendencies from you, can I determine whether this is what you meant?

3. Can you identify the meaning behind this theme as explaining ideas/actions/reactions/reflections expression, there may be multiple realities from the language of the respondents, is expressing ideas/actions/reactions/reflections the key process in this theme?

4. Does something else arise?

5. Is it necessary to appoint someone to document the ideas/actions/reactions/reflections or we do it ourselves?

6. Does anything else that you want to share with me?

APPENDIX E

DEVELOPING A LEARNING ENVIRONMENT THROUGH DEVELOPING INDIVIDUALS

UNDERSTANDING ORGANISATIONAL ROLES

- Staff members need to understand that behind every single cent that they earn from the company is a responsibility that needs to be fulfilled.

- By being recruited, an individual must be thankful to his/her organisation. This thankfulness should be followed by an inspiration to work hard and smart for the sake of the company. Moreover, every organisation expects its members to significantly contribute to its continuous development. In short, staff members must embed this understanding in their mindsets so that motivation to work diligently and thoroughly in the organisations is always exist.

- Staff members need to understand two fundamental aspects when undertaking their work:

    1. The nature of work
    2. Aims and target

- To ease the process of understanding the nature of work, an individual can categorise them into a minor or major category. Be clear with the job specification so that time is not wasted on work that cannot give a positive recognition on the performance evaluation.

- Staff members need to be clear with their aims and targets in certain periods of time. Working without aims or target is like "a blind person touching things in a dark room." Aims and targets should be developed to shed light on how to monitor activity in the organisation. However, do not be too ambitious. Plan aims or targets that are achievable.

INTERNAL STRENGTHS

- The following internal qualities are not the complete elements that contribute to successful work within the organisation. However, being equipped with these qualities will ease an individual to fulfil his/her responsibility to achieve successful work within the organisation.

- This programme highlights the following internal qualities that need to be instilled and practised by staff members:
    1. Personal confidence
    2. Observing accepted organisational approaches
    3. Undertaking tasks with commitment and self-discipline

4. Self-awareness
5. Self-remembrance
6. Compassion
7. Sincerity
8. Willingness to Change

Personal Confidence

- All work must start with this element. A thousand steps start from a single step. However the first step must be inspired with the belief that "I can start my first step."

- For example, look at the climber of a coconut tree. The first thought that occurs in his mind is "Can I climb this coconut tree?" If he is confident enough, he will say "I can do this job" and, as a consequence, he will start using his skill and energy to climb the coconut tree. However, if he is not confident, he will just leave the tree.

- To obtain this internal quality, the following actions must be practised:
  1. Keep telling people that "I can do this job" or, in other words, motivate yourself and others.
  2. When other people give motivation on work, listen carefully and verify it. This includes when we are in a workshop or seminar.

- The benefits of being confident are as follows:
  1. It develops personal ambition for responsibility and the ability to motivate one's self and others, as well as to take personal risks.
  2. It develops a strong commitment to work and to develop others (delegating, coaching, counselling).
  3. It develops a balanced view of the self (both positive and critical, ideal and realistic).

Observing Accepted Organisational Approaches

- By observing accepted organisational approaches, staff members can undertake tasks based on "the right approach for the right situation." This action in turn enables cost, time and energy savings.

- For example, refer back to the above coconut tree climber. To ensure the success of the climbing process, the climber needs to know the best climbing method and the required tools. To assist him in this process, the climber can ask the climbing expert for guidance and advices. By internalising this guidance and advices, the climber is becoming aware of the best strategy to accomplish his mission. This, in turn, can reduce the failure risk.

- To obtain this internal quality, the following actions must be practised:
  1. Keep discussing task accomplishment strategy, experiences and approach formally and informally with the superior and subordinate. This is to gain "new knowledge" or "organisational approach" in undertaking tasks in the organisation.

2. Keep asking experts or persons that have been involved in previous success projects for information on the "organisational approach." In undertaking this task, interviewing skills and persuasive skills are critical. Trust is prominent in this process.
3. Keep adopting an "organisational approach" in the workplace. This can build up sincerity in undertaking that "organisational approach." This, in turn, enables individuals to practise the "organisational approach" confidently. This confidence enables individuals to be steadfast with that "organisational approach."

- The benefits of being aware of the "organisational approach" are as follows:
  1. Develop the ability to shift perspectives, remain open-minded and consider possibilities.
  2. Develop the ability to take multiple and integrated perspectives; to recognise and hold conflicting concepts in mind.
  3. Develop the ability to notice and interpret what is happening in interpersonal interactions.

Undertake Tasks with Commitment and Self-Discipline

- The most important thing that we have to bear in mind when we are in one organisation is that "we must do the job." The main objective of an organisation in recruiting people is to assist the management in achieving the organisational goal, which is maximising profit.

- In addition, staff members must perform organisational tasks with high commitment. Without commitment, it is difficult for staff members to do their jobs diligently and thoroughly. This, in turn, will affect the quality of the service/operation/product.

- In the case of the coconut tree climber, he must have a willingness and commitment to climb the tree. His effort in climbing the tree is the most important part of the whole climbing process. His reluctance to climb will deny the involved person from receiving money from the coconut sale.

- To obtain this internal quality, the following actions must be practised:
  1. Before starting any job, we should envisage the risk of failing to accomplish the task and therefore tell ourselves and others the importance of accomplishing the given task within the organisation.
  2. During the task we have to adopt five elements: (a) the right faith, in which we feel confident that we can do the job; (b) the right procedure, in which we perform the task in accordance with the established criteria; (c) the right spirit, in which we envisage the benefit that will be gained when completing the task; (d) the right intention, in which we do the job for the sake of the company and (e) a good degree of morale, in which we always perform our best for the best organisational performance.
  3. After completing one task, we should check for any deficiency and, consequently, set the intention of improving it in the future.

- The benefits of being "hardworking" are as follows:
  1. Ensure the survival of our career and company.

2. Develop assertiveness and capability to deal with conflict.
3. Have the strength to persuade others to work hard and to manage organisational politics.

Self-Awareness

- The definition of self-awareness that is adopted in this programme is: "an ability to know what is the organisational task that needs to be accomplished at one particular time." The task, on the other hand, is accomplished by adopting the accepted organisational approach. In other words, it is related to the phrase "do the right things at the right time." This definition is used to enable staff members to cope effectively with the rapid changes in the organisational life and environment.

- For instance, the knowledgeable coconut tree climber will consider three elements before climbing the tree. He will: (1) ensure that the climbing task is the most important one to be accomplished at that particular of time; (2) be aware of the "best practice" that needs to be adopted in order to accomplish the climbing task successfully; and (3) he will pluck the right coconut so that he will get a good value for it.

- To obtain this internal quality, the following actions must be practised:
  1. To know "what is the organisational task that needs to be accomplished at one particular time" and to gain an understanding on job scope, job delegation and organisational structure. The understanding can be developed through formal and informal meetings between superior and subordinate.
  2. To accomplish the task by using the accepted organisational approaches, a workshop should be undertaken. In addition, informal discussion between staff members should be encouraged.
  3. Appreciate the sharing of knowledge between staff members and persuade others to have the same value.

- The benefits of being knowledgeable are as follows:
  1. It enables individuals to use their skills and knowledge flexibly, make better judgements about what needs to happen and be more ready to see a range of behavioural options for themselves.
  2. It assists in gaining clarity and using information effectively; it provides the ability to sort, prioritise and analyse data.
  3. It assists the development of self-control and self-discipline.

Self-Remembrance

- This value requires individuals to mind their actions when undertaking a task so that it can be accomplished effectively and efficiently. At the same time, individuals need to remember that, through their effective action, the company can achieve a good profit and, as a consequence, give them a good salary and bonus. The combination of these two values can motivate themselves and others to work hard and smart.

- To use an example, the coconut tree climber must always remember that he needs to climb the tree carefully so that he can reach the top. At the same time, he should remember that, if he can reach the top part of the coconut tree, he can start plucking the coconuts and, as a consequence, he can generate income from that.

- To obtain this internal quality, the following actions must be practised:
  1. Keep discussing the importance of minding one's actions in the company with colleagues. This is to instil a "remembrance" value informally among staff members.
  2. Always have a briefing session before starting work, so that all staff members will know what should be done on that day.

- The benefits of having a "remembrance" value are as follows:
  1. It helps develop a visionary ability – thinking in a long term perspective and envisaging a strategic direction.
  2. It helps develop the skill to manage organisational politics wisely.

Compassion

- To have a feeling that the whole organisation is like a "family." Every staff member should appreciate other members because everyone must have the same aim and objective in terms of job security. All staff members should learn how to "love" each other so that they can work in harmony.

- To use an example, the coconut tree climber should not have the intention of throwing a coconut to the person who is waiting on the ground so that he can get all the money. On the other hand, the ground person should not have the intention of running away with the coconut so that all the money will belong to him. Both parties should have a feeling to share the benefit of their work fairly.

- To obtain this internal quality, the following actions must be practised:
  1. Appreciate "family" value within the organisation and call others to have the same value.
  2. Try to appreciate the person who has more knowledge than us, try to respect the person who is older than us and try to love the person who is younger than us.
  3. The superior should try to appreciate his/her subordinate and the subordinate should try to respect his/her superior.

- The benefits of being compassionate to others are as follows:
  1. Develop the ability to manage emotions appropriately.
  2. Develop personal resilience (coping with pressure and adversity, or "bouncing back").

Sincerity

- This is the most important intrinsic value that should be instilled in the heart. Every staff member must have a feeling that he/she works for the sake of the company and for fulfilling their responsibilities to the company. Failure to instil sincerity results in

dissatisfaction and annoyance to the company amongst staff members. As a result, the staff members' spirit of working gradually decreases.

- In the case of the coconut tree climber, if he is not sincere he will pluck the wrong coconut so that nobody can get any benefit from him. However, by doing this, his colleagues will get annoyed and, as a consequence, will not trust him in future.

- To obtain this internal quality, the following actions must be practised:
  1. Always discuss with others the importance of being sincere in the workplace and call them to adopt it in daily work.
  2. Always check intentions – before, during and after – when doing any work. If we feel that we have wrong intentions, we must rectify them as soon as possible.

- The benefits of being sincere are as follows:
  1. It helps develop the ability to trust and value others as well as oneself within the organisation. This leads to empowerment and development of staff.
  2. It helps develop the ability to retain an objective view of his or herself.

Willingness to Change

- Due to rapid changes in organisational life and business environment, organisational strategy and approach should also change accordingly. For this to be achieved, staff members should have a willingness to change. This process is like a continuous improvement in organisation so that its competitiveness will not deteriorate.

- If the above coconut tree climber does not want to come down from the coconut tree, nobody will get the benefit. The ground people will not get the coconut because the climber will feel convenient by being at the top part of the coconut tree. On the other hand, the climber will not learn how to improve his climbing skill in the future.

- To obtain this internal quality, the following actions must be practised:
  1. Attend the entire career development programme that is organised by the management.
  2. Sacrifice traditional beliefs and methods and thus be able to exploit the current opportunity in the market.
  3. Keep telling people about the importance of being changed and prepare them for that change.

- The benefits of being able to change are as follows:
  1. Develop and maintain an integrated view of the organisation and its external environment.
  2. Develop an understanding of the process of organisational change and, as a consequence, prepare the "tool kit" of techniques for analysing, problem solving and decision making to cope with it.
  3. Enable the organisation and its members to keep abreast of current development in "best practice" methods and principles.

FORMALITY AND INFORMALITY

- Another element that is proposed by this research to develop meta-abilities is the ability to conduct formal and informal discussion in the organisations. This is because staff members face various tasks in daily activities – routine, non-routine, official and unofficial. To cope with this variety, the integration of formal and informal discussion in handling tasks becomes necessary. Formal approaches are factors such as meetings, progress reports and performance evaluation reports. Informal approaches are dialogues, face-to-face interactions, corridor meetings, lunch table chats and coffee/tea table chats. In this case, each staff member must not be rigid in solving problems with other members. Being equipped with the ability to conduct formal and informal actions, it is argued that staff members can read situations, understand and resolve problems, and consider a range of options in a collective manner.

- The ability to conduct formal and informal discussion can encourage staff members to solve problems according to their context and situations. The information processing mix that is proposed in this training is illustrated in Figure 1.

	Routine	Non-routine
Official	MIS Management Accounting Systems Production control systems Transaction accounting processing	Access facilities Task forces Liaison roles
Unofficial	Black-books Just in case files	The grape vine Lunch table chats

Figure 1 The information processing mix
Source: Earl and Hopwood (1980)

- There are five factors that rationalise the importance of formal and informal discussion.

1. Power: The manner in which power structures are sustained. Face-to-face contact, in particular, provides the opportunity to build alliances and to extract additional information. A subordinate could solicit support for, or defuse the impact of, unfavourable numbers. A superior could justify the existence of his position, gain knowledge – which would reduce the impacted knowledge of subordinates – and could choose to either disguise unfavourable numbers or expose the "incompetence" of the segment which a subordinate is represented with.
2. Performance: Performance was monitored and guided in a less formal manner and additional information was obtained to assist these processes. Such information could be quantitative, available from operational or marketing information systems, or financial, available through capturing and classifying raw financial data. This enabled staff to protect themselves from criticism by their superiors through being knowledgeable. Informal dialogue also presented the opportunity to revise numbers or develop defensive arguments before presentation in a formal meeting.
3. Sharing risk and signalling: Closeness between senior staff in operating units and divisions inclined managers in the former to seek advice or confirmation, even for decisions which were strictly within their own jurisdiction. Less formal meetings provided participants with the opportunity to rationalise events, initiate wider communication to ameliorate unpleasant surprises, and also to share risks.

4. Responding to the environment: Face-to-face meetings, with several individuals present, also provided a congenial social gathering whilst enabling ideas to be explored in a less formal manner. The fear of rebuff was reduced. This potentially spurred creativity, which benefited both subordinate and superior participants, and also the organization as a whole. Successful managers constantly monitor their environments, and respond to changes, particularly during recession periods.
5. Implications for conventional wisdom: The consequences for conventional wisdom, of this culture of informal control, are potentially far reaching. Although the formal presentation of information upwards through the organisational hierarchy is important, for the sake of good order and achieving integration, contact culture enables information to be used in a more dynamic manner. Involvement of divisional staff acted as a catalyst for finding solutions. This drew information into a more dynamic arena, and potentially enhanced its importance.

RATIONAL DISCOURSE

- A rational discourse ensures that the arguments of all interested parties are heard, that the choice results in an informed consensus, and the formal value choice is only made by the force of the better argument.

- The following four conditions must be met with a rational discourse:
  1. All potential participants in a rational discourse must have an equal opportunity to begin a discourse at any time and to continue it by making speeches and rebuttals, and by questioning and answering. This is called "an equal chance to use communicative speech acts."
  2. For all participants there must be an equal opportunity to interpret, to assert, to recommend, to explain and to justify as well as to question or give evidence for or against the validity claim of any of these forms of speech. The purpose of this condition is to ensure that, in the long run, no presupposition or opinion can escape from becoming the centre of discussion and criticism.
  3. All participants are presumed to be equally able to express their attitudes, feelings and intentions. This is called a representative speech act and serves as a guarantor against self-deceit, illusions and insincerity of members among the speech community towards one another.
  4. All participants are presumed to be equally able to give and refuse orders, to permit and prohibit, to promise or ask for promises, to account and ask for accounting, etc. This is called a regulative speech act. It guarantees that the formal chance of equal distribution of opportunity to begin or continue a discourse is realised.

- For a rational discourse to be effectively implemented, three types of barriers must be overcome:
  1. Social barriers exist because of inequalities in power, education, resources, etc. Social inequalities lead to bias of perception and presentation, blockage of information and conscious or subconscious distortions.
  2. Economic and motivational barriers exist because time constraints make it impossible to deal with all possible participants, arguments and counterarguments, as suggested above. In practice, the psychological and economic cost of debate prevent this. People are simply not motivated to argue for a long time to deal with all possible objections and implications. Furthermore, there are social norms that

discourage disagreement and thereby breed conformity. Hence, commitment to rational discourse implies changing existing social norms from those working against openness and sharing, to rules of discourse which favour good communication. This entails instilling a new, preferred type of social ethics with supporting customs.

3. Linguistic barriers exist because the rationality of human communication tends to suffer from conflicting and ambiguous meanings, difficulty in expressing complex matters, limits of the human brain to comprehend lengthy reports and other factors which impede mutual understanding.

- To overcome the linguistic barriers, any arguments presented in the discussion must be checked against four types of validity claims:

1. Intelligibility. Intelligibility refers to the assumption that the meaning of what is being said is clear to all concerned. Intelligibility must be satisfied before the other claims can be checked.
2. Truth. Truth refers to the correspondence between factual claims and the actual state of affairs.
3. Veracity. Veracity refers to the sincerity of intentions of the speaker, that each is speaking honestly and without guile.
4. Normative justification or legitimacy. Legitimacy implies that the claimed value statement is consistent with norms and principles which have been validated through a rational discourse.

- The above three barriers could be overcome. This would involve the following factors:

1. Changing of social attitudes. The underlying challenge in this is to change social attitudes of organisational actors so that principles of criticism and logical analysis are elevated above social norms of conformity and acceptance of customs and traditions. Insofar as social norms mutually stabilise and reinforce existing attitudes and beliefs, they are undesirable from the perspective of a rational discourse and need to be constantly contested.
2. Importing of democratic checks and balances into organisations. There are some classic examples of the creation of social institutions and arrangements which facilitate a rational discourse. Historical examples include the separation of government powers and the adversarial system represented by courts of law and in bicameral parliamentary systems. They assure that the social justification of decisions can be made rational which could also apply to value judgements in the context of management.

- In addition, the organisations need to encourage critical thinking, evidence collection and formation of opinions in response to the best evidence disregarding extraneous influences such as vested interests or social conformity. The articulation of opinions and their sharing through participation in debate should also be encouraged.

DISCUSSION CASES

Case 1: Children and the Railway

A group of children are playing near two railway tracks, one is still in use while the other is disused. One child plays on the disused track, the rest play on the operational track. A passenger train comes and you are just beside the track interchanger. You can easily make the train change its course to the disused track and save most of the children. However, this means that the lone child playing by the disused track will be sacrificed. Would you just let the train go its way?

Question:

1. What is your choice(s)?

Case 2: The Brick

A young and successful executive was travelling down a neighbourhood street, going a bit too fast in his new Jaguar. He was watching for kids darting out from between parked cars and slowed down when he thought he saw something.

As his car passed, no children appeared. Instead, a brick smashed into the car's side door! He slammed on the brakes and reversed the car to the spot where the brick had been thrown. The angry driver then jumped out of the car, grabbed the nearest kid and pushed him up against a parked car shouting, "What was that all about and who are you? Just what the heck are you doing? That's a new car and that brick you threw is going to cost a lot of money. Why did you do it?"

The young boy was apologetic. "Please, mister please, I'm sorry but I didn't know what else to do, "He pleaded. "I threw the brick because no one else would stop..." With tears dripping down his face and off his chin, the youth pointed to a spot just around a parked car. "It's my brother," he said. "He rolled off the curb and fell out of his wheelchair and I can't lift him up."

Now sobbing, the boy asked the stunned executive, "Would you please help me get him back into his wheelchair? He's hurt and he's too heavy for me."

Moved beyond words, the driver tried to swallow the rapidly swelling lump in his throat. He hurriedly lifted the handicapped boy back into the wheelchair, then took out a linen handkerchief and dabbed at the fresh scrapes and cuts. A quick look told him everything was going to be okay.

"Thank you and may God bless you," the grateful child told the stranger. Too shook up for words, the man simply watched the boy push his wheelchair-bound brother down the sidewalk toward their home.

It was a long, slow walk back to the Jaguar. The damage was very noticeable, but the driver never bothered to repair the dented side door. He kept the dent there to remind him

of the advice "Don't go through life so fast that someone has to throw a brick at you to get your attention!"

Question:

1. What is the moral of the story?

Case 3: Managing Politics – damned if you do; damned if you don't

Fran Gilson has spent fifteen years with the Thompson Grocery Company. Starting out as a part-time cashier while attending college, Fran has risen up through the ranks of this 50-store grocery store chain. Today, at the age of 34, she is a regional manager, overseeing seven stores and earning nearly RM 80,000 a year. Fran also thinks she's ready to take on more responsibility. About five weeks ago, she was contacted by an executive-search recruiter inquiring about her interest in the position of vice-president and regional manager for a national drug store chain. She would be responsible for more than 100 stores in five states. She agreed to meet with the recruiter. This led to two meetings with top executives at the drug store chain. The recruiter called Fran two days ago to tell her she was one of the two finalists for the job.

The only person at Thompson who knows Fran is looking at this other job is her good friend and colleague, Ken Hamilton. Ken is director of finance for the grocery chain. "It's a dream job," Fran told Ken. "It's a lot more responsibility and it's a good company to work for. The regional office is just 20 miles from here so I wouldn't have to move. And the pay is first-rate. With the performance bonus, I could make nearly RM200,000 a year. But best of all, the job provides terrific visibility. I'd be their only female vice president. The job would allow me to be a more visible role model for young women and give me a bigger voice in opening up doors for women and ethnic minorities in retailing management."

Since Fran considered Ken a close friend and wanted to keep it a secret that she was looking at another job, she asked Ken if she could use his name as a reference. Ken said, "Of course. I'll give you a great recommendation. We'd hate to lose you here, but you've a lot of talent. They'd be lucky to get someone with your experience and energy." Fran passed Ken's name on to the executive recruiter as her only reference at Thompson. She made it very clear to the recruiter that Ken was the only person at Thompson who knew she was considering another job. Thompson's top management is old fashioned and places a high value on loyalty. If they heard she was talking to another company, it might seriously jeopardise her chances for promotion. But she trusted Ken completely. It's against this backdrop that this morning's incident became more than just a question of sexual harassment. It became a full-blown ethical and political dilemma for Fran.

Jennifer Chung has been a financial analyst in Ken's department for five months. Fran met Jennifer through Ken. The three had chatted together on a number of occasions down in the coffee room. Fran's impression of Jennifer is quite positive. In many ways, Jennifer strikes Fran as a lot like she was ten or so years ago. This morning, Fran came to work around 6:30 a.m. as she usually does. It allows her to get a lot accomplished before "the troops" roll in at 8:00 a.m. At about 6:45, Jennifer came into Fran's office. It was immediately evident that something was wrong. Jennifer was very nervous and uncomfortable, which

was most unlike her. She asked Fran if they could talk. Fran sat her down and listened to her story.

What Fran heard was hard to believe, but she had no reason to think Jennifer was lying. Jennifer said that Ken began making off-colour comments to her when they were alone, within a month of Jennifer joining Thompson. From there it got progressively worse. Ken would leer at her. He would put his arm over her shoulder when they were reviewing reports. He patted her rear. Every time one of these occurrences happened, Jennifer would ask him to stop and not do it again. But it fell on deaf ears. Yesterday, Ken reminded Jennifer that her six-month probationary review was coming up. "He told me that if I didn't sleep with him that I couldn't expect a very favourable evaluation." She told Fran that all she could do was go to the ladies room and cry.

Jennifer said that she had come to Fran because she didn't know what to do or whom to turn to. "I came to you, Fran, because you're a friend of Ken's and the highest ranking woman here. Will you help me?" Fran had never heard anything like this about Ken before. About all she knew regarding his personal life was that he was in his late thirties, single, and involved in a long-term relationship.

Questions

1. Analyse Fran's situation in a purely legalistic sense. You might want to talk to friends or relatives who are in management or the legal profession for advice in this analysis.
2. Analyse Fran's dilemma in political terms.
3. Analyse Fran's situation in an ethical sense. What is the ethically right thing for her to do? Is that also the politically right thing to do?
4. If you were Fran, what would you do?

Case 4: Leadership – developing leaders at the AYZ Group

Saiful has a serious problem. He can't find enough of the right kind of managers. Saiful is chief executive of the AYZ Group, a Malaysian shipyard and construction company that he is trying to expand into a diversified multinational corporation. Like many other chief executives in Asia, he sees an abundance of business opportunities and has the financial resources to pursue them. Yet there is a shortage of managers in the region. Not just any managers, but flexible, creative professionals who are comfortable in an increasingly competitive and sophisticated market. Most managers that Saiful finds have skills that are no longer appropriate for the changing competition they face. As wages have risen, the region's traditionally low-tech companies have had to move onto higher-value-added products whose success depends on expertise – overseas marketing sophistication and ability to direct highly skilled professionals, for instance – that old-line managers often do not have.

To compound Saiful's problem, the pool of potential managers with the educational level he needs is small. In Malaysia, only six percent of workers are university educated. This compares with twenty-three percent in the United States and sixteen percent in Japan. And the competition among Asian companies for skilled and educated managers is fierce.

Saiful realises that he must invest in developing his company's future leaders. He could offer formal classes in management and leadership, and supplement this with on-the-job training. But he's not exactly sure what such a formal leadership programme might look like. Or maybe he should look to graduates of business schools outside of Asia?

Questions

1. What kind of leadership do you think is needed in AYZ Group?
2. Do you think hiring non-Asians with advanced business degrees could solve Saiful's problem? Discuss.
3. Should Saiful hire Asians from Europe or North America? Discuss.
4. As a consultant hired by Saiful, design a leadership programme that would meet his needs.

GUIDELINES FOR DISCUSSION

Case 1

Let's pause to think what kind of decision we can make. Most people may choose to divert the course of the train, and sacrifice one child. Do you agree? To save most of the children at the expense of one child appears to be a rational decision, morally and emotionally. But, have you ever thought that the child choosing to play on the disused track has in fact made the right decision to play at a safe place? Nevertheless, he had to be sacrificed because his ignorant friends choose to play where the danger is.

This kind of dilemma happens around us everyday - in the office, community and in politics, the minority is often sacrificed for the interest of the majority, no matter how foolish or ignorant the majority are, and how far-sighted and knowledgeable the minority are. The child who chooses not to play with the rest on the operational track was sidelined and sacrificed, and no one will shed a tear for him. The friend who forwarded me the story said he will not try to change the course of the train because he believes that the children playing on the operational track know that the track is still in use, and that they will run away if they hear the train's horn.

If the train is diverted, the lone child will definitely die because he never expects the train will come over to that track! Moreover, that track is not in use, probably because it is not safe. If the train is diverted to the track, the lives of passengers on board may be put at stake! Whatever decision you make, my friend, choose wisely.

Case 2

God whispers in our souls and speaks to our hearts. Sometimes when we don't have time to listen, he has to throw a brick at us. It's our choice to listen or not.

God didn't promise days without pain, laughter without sorrow, sun without rain, but He did promise strength for the day, comfort for the tears and light for the way.

Read this line very slowly and let it sink in... If God brings you to it, He will bring you through it.

APPENDIX F

The Development of Meta-Abilities

Respondent	Cognitive Skills	Self-Knowledge	Emotional Resilience	Personal Drive
Abdul Halim	Solving problems better More open-minded	Aware of personal weaknesses	Able to control emotions Preserves good relationship	Improve motivation to work hard
Abdul Rahim	Solve problems collectively Receptive to any ideas	Act according to the consensus Act according to the company's best approach	Not arrogant, angry and too sensitive Be patient with the staffs' attitudes	Feel responsible for developing the company Motivation to complete tasks on time Motivation to improve unit's performance Join the staff in the daily activities
Amran	Solving problems better	Gain awareness to contribute to the best Do not trivialise problems Able to determine the personal goals	Improve personal confidence Improve relation with others	Feel responsible for completing tasks on time and with high quality Motivation to achieve target Willingness to face the challenges
Anuar	Think before start working	Act according to the consensus Gain virtuous values to control tasks	Able to control emotions better Remain objective and self-discipline	Always think positive Willingness to face the challenges
Azahari	More open-minded Gain inputs to deal with top people	Become more self-discipline	Let the annoyed persons express their feeling first Control voice when arguing with somebody	Improve motivation to work hard
Azize	More organised in the office Able to prioritise tasks	Act according to the accepted procedures	More rational in preserving good relationships	Motivation to be determined and defined in the workplace Positive thinking
Azmi	More open-minded Solve problems collectively	Uphold the best practice Document the activities	Improve self-confidence Gain strength to control emotions	Be determined on what is suppose to be done
Fakhrurazi	Broaden scope of thinking Gain skill to manage tasks More open-minded Solve problems collectively	Uphold the best practice	Improve relations with others More patient and not to jump conclusions Able to control emotions	Motivation to improve personal performance
Hazis	Able to refresh knowledge and skills	Experience the improvement	Experience the improvement	Improve motivation to work hard Feel responsible for developing the company
Herlina	Broaden scope of thinking Gain perceptual acuity Concentrate on the current tasks Solve problems collectively	Undertake tasks according to best practices Act according to the consensus Able to set targets	Collaborate with others in problem solving Improve self-confidence Ignore all disruptions	Motivation to work hard Feel responsible for developing the company Motivation to achieve target Positive thinking Motivation to change for better achievement
Ishak	Ability to prioritise tasks Think that the company will suffer if anything goes wrong	Evaluate tasks effectively Concern with daily tasks	Improve personal confidence Less grumpy in the workplace	Feel responsible for developing the company

	Establish a well-planned schedule	Undertake tasks according to the best practices	Self-discipline Sincerity Collaborate with others in the workplace	
Kamal	Solve problems collectively Undertake tasks collectively	Undertake tasks according to best practices	Compassionate to others Control tension and anger No backbiting	Desire to change for betterment No rigidity in the working style Desire to always achieve targets
Mazalan	Solve problems collectively Broaden scope of thinking	Concern with staff welfare Concern with the performance of the unit	Strength to face difficulties and conflicts Calm down and give advices Improve self-discipline	Motivation to improve performance Motivation to improve tasks
Md Isa	Undertake tasks systematically and collectively More open-minded	Utilise different language for different people Keep reminding self on what should be done at every time	Able to remain objective and self-discipline under pressure Openhearted and take everything normal Improve personal confidence Good perception on others	Feel responsible for developing the company Motivation to complete tasks Desire to make accurate decision Positive thinking
Mohamed Ridzuan	No changes	No changes	No changes	Dare to take risks Willingness to change for career development
Mohd Adi	Solve problems collectively and systematically Become more open-minded	Act according to the planning	Strength to face difficulties Dare to take challenges Self-confidence Not sad if idea is not accepted	Motivation to develop the company Positive thinking
Mohd Azmi	More open-minded Solve problems collectively Respect others' idea if it is rational Prioritise tasks effectively	Gain ideas to produce quality work Act according to the consensus Act according to the best practice Able to set targets	Respect, understand and do not drop others' water face	Openhearted feeling Desire to always achieve targets Able to be frank when dealing with others
Mohd Rahmat	Solve problems collectively and systematically	Act according to the company's norms and procedures Act according to the consensus	Build good relationship with others Positive views on others Put aside dissatisfaction	Feel responsible to the company Motivation to work hard
Mohd Syafawi	Able to support views More open-minded Solve problems collectively	Able to determine the personal goals Act according to the consensus	Managing time better Control the work pressure and conflict better Able to control emotions better	Motivation to gain knowledge for tasks improvement Feel responsible for improving tasks Motivation to work hard Motivation to develop the company No rigidity in the working style
Mohd Syukri	Prioritise tasks effectively Able to be more focus in the workplace Solve problems collectively	Able to determine the personal goals Aware of the role every time Document the activities Act according to the best practice	Ignore ridiculous statement	Feel responsible for giving the best to the company
Mohd Wahyudi	Think globally work locally Prioritise tasks better Solve problems	Act according to the plan Act according to the accepted practice	Improve personal confidence Strength to face difficulties	Motivation to produce quality work

	rationally	Able to diagnose problems better	Gain ability to control work pressure Able to control emotions better Never blame others	
Mohd Yazi	Whenever idea get rejected, will examine its causes and act accordingly	Act according to the early plan Able to determine the personal goals Act according to the consensus Act according to the best practice	More self-discipline Manage conflict better Manage bad habit better Not sad if idea is not accepted	Motivation to develop the company Trust others Feel responsible for completing the tasks Motivation to work hard and achieve target Willing to change
Mohd Zulmahri	Solve problems systematically Prioritise tasks and information Know better scope of work	Act according to the accepted practice	Able to console hurt feeling Able to control emotions better Strength to face difficulties	Feel responsible for developing the company
Norazlan	Establish a well-planned schedule Solve problems systematically and collectively Set the deadline for the tasks	Act according to the plan Aware of role every time Act according to the accepted procedures	Managing time better More patient Strength to face human-related difficulties Not sad if idea is not accepted	Committed to the tasks Feel responsible for fulfilling the entrusted tasks or develop the company Motivation to work hard and achieve target Motivation to give the best to the company Feel responsible for completing tasks on time and at minimum cost
Nordin	Improve the ability to work collectively	Able to determine the personal goals Undertake tasks according to best practices	Improve the ability to control emotions	Feel responsible for completing tasks on time
Rosli	Able to be focus in the workplace Prioritise tasks better	Act according to the accepted procedures	Gain strength and compassion to face conflicts Ignore what people said and be patient Improve personal confidence	Motivation to give the best and be more punctual Motivation to work hard and with due diligence Motivation to complete tasks on time
Ruzuan	Adopt rational views in action Able to be focus in the workplace	Act according to the consensus	More patient in handling staff and conflicts Not sad if ideas are not accepted Managing time better Improve personal confidence	Motivation to develop the company Join the staff in work – became soft heart Develop a sense of responsibility to the company
Samsulisam	Gain skill to organise daily tasks and staff Establish a well-planned schedule Solve problems collectively	Able to determine the personal goals Act according to the consensus Uphold the best practice	Strength to face difficulties Appreciate and compromise other views Improve the ability to control emotions Not sad if ideas are not accepted	Feel responsible for developing the company Motivation to work hard and with due diligence Develop a sense of responsibility to the company
Shaarin	Solve problems collectively Prioritise work effectively More open-minded Know better scope of work Receptive to other	Aware of the role every time Approach people differently to maximise their involvement	Improve confident to face colleagues/staff Able to control bad temper	Motivation to work hard Develop a sense of responsibility to the company No rigidity in the working style

	suggestions			
Susi	Prioritise tasks better	Aware of aims Understand self and tasks better Understand the impact of actions on others	Able to seek apology	Motivation to work hard and smart Develop a sense of responsibility to the company
Tg Mahathir	Know better scope of work Prioritise work effectively More receptive to other suggestions	Aware of the role every time Act according to the consensus Uphold the best practice	Undertake tasks without grumpy remarks	Feel responsible for developing the company Motivation to work properly Feel responsible for completing the tasks Less bossy
Yaakop	Solve problems collectively	Undertake tasks according to the consensus	Confident to talk to others Reduce nervous when dealing with others More patient Not jump into conclusion easily Ignore what people said Console heart and calm down No backbiting	Positive thinking Openhearted feeling Feel responsible to develop the company
Yumas	Solve problems collectively	Aware of the role every time Keep reminding self on what should be done at every time Act according to the best practice	Do not want to upset others Have strength to control emotions Confident to be independent	Motivation to work hard Feel responsible for developing the company
Zaini	Prioritise tasks better	Evaluate tasks based on its source Act according to consensus	Confident to fulfil responsibility Strength to face difficulties Control temper, hard feeling and remain objective More open-minded Do not mind if idea is rejected	Motivation to work hard Feel responsible for developing the company
Zainizam	Solve problems collectively	Act according to the best practices Act according to the consensus	Gain sincerity Improve personal confidence and behaviour Do not drop others' water face Good perception on others	Feel responsible for developing the company Motivation to work hard Motivation to complete tasks on time
Zainol	Solve problems collectively Prioritise tasks better Able to be more focus and determined Respect others' idea if it is rational Broaden scope of thinking	Evaluate tasks based on its source Act according to the best practice	Put aside distractions No giving up Do not bother if get scolded Able to accept criticism from others Uphold compromise value	Motivation to improve the performance Motivation to work effectively Positive thinking when facing problems Work towards prospering the company
Zakaria	Solve problems collectively and systematically Able to be more focus in the workplace	Understand personal goals Act according to the collective decision	More patient Gain sincerity Ignore ridiculous statements Managing time better Put aside personal stuff	Motivation to study documented information Motivation to complete tasks on time Motivation to work hard Feel responsible for developing the company
Zulkipli	Solve problems collectively and systematically	Implement tasks according to best practices	Dare to receive complaints or objections Improve personal	Motivation to work hard Do not give up Dare to take new tasks and

			confidence	try new approaches
Zuriana	Experience marginal impact	Able to determine the targets	Able to control emotions	Positive thinking Motivation to complete tasks on time Motivation to work with due diligence Able to be frank when dealing with others

APPENDIX G

The Development of Influencing Skills, Sharing Attitudes and Inquisitive Tendencies

Respondent	Influencing Skills	Sharing Attitudes	Inquisitive Tendencies	First Level Themes
Abdul Halim	Improve communication skills	Promote good relationship with others Share work-related information actively Express ideas in the meeting	Refer problem to the experts Learn the environment in the workplace	Interact with others for unit development Express ideas in the meeting Interact with others for task improvement Act according to the company's norms Refer unsolved problem to the expert Analyse the problem in depth before action
Abdul Rahim	Reduce timidity or shyness to communicate with others Monitor the performance of the staff Delegate tasks smoothly Develop staff to contribute significantly to the company	Express views in the meeting Share work-related information actively	Gain confidence to undertake formal or informal discussion with others Gain knowledge to improve skills	Interact with staff to develop them and unit Highlight issue in the formal or informal discussion Gain motivation for learning Interact with others for task improvement Aware of the approach whenever face problem Delegate tasks in an effective manner Analyse the problem in depth before action
Amran	Daily briefing from the staff Obtain others' views in the meeting/discussion	Gain confidence and desire to interact with others for task improvement Create cohesion in the unit Share work-related information actively	Ask for second opinions to improve the tasks Gain knowledge to improve skills Appreciate others' views	Interact with others for unit development Gain motivation for learning Interact with others for task improvement Act according to the consensus Obtain operational inputs before making decision
Anuar	Influence through good personality Comment on staffs' performance individually Develop staff actively	Promote good relationship with others Create cohesion and unity in the workplace	Discuss the problems with others Refer unsolved problem to the right people	Interact with staff to develop them and unit Became confident to express ideas Leadership by example Act according to the consensus Refer unsolved problem to the right people Contemplate problem in depth before action
Azahari	Improve communication skills Instil a teamwork spirit Develop staff actively	Express concerns if other view is not so realistic Promote good relationship with others Share work-related information actively	Solve problem through the medium of discussion Refer problem to the top people Gain feedback for skill improvement	Interact with staff to develop them and unit Express concerns to the top people actively Interact with others for task improvement Act according to the consensus Feel sensitive to unit development Refer unsolved problem to the expert
Azize	Develop others actively Improve communication skills	Gain confidence to express problem to the top people Promote	Solve problem through the medium of discussion Refer staff to the	Interact with staff to develop them and unit Highlight issue in the formal or informal discussion

	Know how to delegate tasks Ask top people to change if something is not right Instil a teamwork spirit	communication culture in the unit Remind about late project Share work-related information actively	experts	Interact with others for task improvement React to issue acutely to improve operation Act according to the consensus Delegate tasks in an effective manner Refer unsolved problem to the expert
Azmi	Improve communication skills Able to delegate task smoothly Able to convince others in problem solving More confident to deal with boss/colleagues	Express weaknesses to others Express ideas in the meeting Less selfish in sharing work-related information	Refer unsolved problem to the boss/experts Do not shy to ask for help from others	Highlight concerns in the meeting Gain confidence to convince others Interact with others for task improvement Act according to mutual understanding Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert
Fakhrurazi	Improve communication skills Evaluate one issue thoroughly with others before making decision Develop unit actively	Share work-related information actively Inform the progress to the top people	Solve problems through the medium of discussion Appreciate others' views Ask to determine the best practice	Interact with others for unit development Became confident to express ideas Interact with others for task improvement Act according to the consensus Evaluate problem in depth before making decision Obtain operational inputs before making decision
Hazis	Became confident to express ideas	Promote good relationship with others Share work-related information actively	Refer unsolved problem to the colleagues	Interact with others for unit development Became confident to express ideas Interact with others for task improvement Act without compromising good relationship with others Refer unsolved problem to the colleagues Analyse the problem in depth before action
Herlina	Other people feel confident and trust on her Start communicating with others Staff do not hesitate to seek for assistance and advices	Have a rational discourse with others Build good relationship with others Create good cooperation in the unit No more selfishness in sharing work-related information	Gain confidence to ask others Gain feedback and cooperation for work improvement	Interact with staff to develop them and unit Able to share idea in the rational discourse for solving problem Interact with others for task improvement Act according to the consensus Obtain operational inputs before making decision Visualise the impact of the action from broad perspective
Ishak	Influence through good outcome	Share work-related information actively	Solve problems through the medium of discussion Refer unsolved problem to the colleagues	Interact with others for task improvement Feel responsible to express ideas Leadership by example Act according to the consensus Refer unsolved problem to the colleagues
Kamal	Let others judge the	Share work-related	Gain feedback to	Interact with staff to develop

	completed tasks Reduce tension through good communication Listen to others' views and act accordingly Influence others through good working style Assist the staff to solve the problem	information actively Build good relationship with others Create happy environment amongst staff Express concerns to the top people	improve knowledge Refer unsolved problem to the boss/experts	them and unit Highlight concerns to the right people Gain motivation for learning Interact with others for task improvement React to issue acutely to improve operation Leadership by example Refer unsolved problem to the expert Visualise the risk of making mistakes
Mazalan	Improve communication skills Monitor the performance of the staff Assist the staff to solve the problem Gain strength to coach others for task improvement Develop the staff to be rational rather than emotional	Build good relationship with others Create cohesion in the workplace Ask staff to think about the advices at home Share work-related information actively Inform the staff about complaints and react collectively	Ask others regarding the feasibility or practicality of personal views Solve problem based on consensus agreement	Interact with staff to develop them and unit Became confident to express ideas Interact with others for task improvement Act according to the consensus React to issue acutely and collectively to improve operation Obtain operational inputs before making decision
Md Isa	Talking and socialising with others Gain skills to delegate tasks smoothly Motivate staff to participate in the task implementation process Gain ability to persuade others in the workplace	Create unity in the unit Share work-related information actively If necessary, remind others about the previous decision in the meeting	Refer problem to the experts Ask for confirmation on certain issue	Interact with staff to develop them and unit Highlight concerns to the right people Interact with others for task improvement Seek participation from other members Obtain confirmation before making decision Refer unsolved problem to the expert Delegate tasks in an effective manner
Mohamed Ridzuan	Experience marginal impact	Share work-related information actively	Gain confidence to ask the boss/experts Gain inputs before making decision	Interact with others for task improvement Obtain operational inputs before making decision
Mohd Adi	Improve communication skills Question the rational of the task Delegate tasks smoothly Develop staff to be active and independent	Stress on sharing information with others Promote good relationship in the unit	Develop strength to ask others to tackle problem Ask for the progress report	Interact with staff to develop them and unit Became confident to express ideas Interact with others for task improvement Act according to collective approach Question the rationale of the task Delegate tasks in an effective manner Obtain operational inputs before making decision
Mohd Azmi	Reduce shyness to communicate with others Assist the staff to solve problem Delegate tasks smoothly Remind staff to not be shy	Able to express ideas in the meeting Remind staff to not bring personal stuff into the workplace Create cohesion in the workplace Share work-related information actively	Obtain clarification from the staff who has problem Solve problems through the medium of discussion Ask for the progress report	Interact with staff to develop them and unit Highlight concerns in the meeting Gain confidence to convince others Interact with others for task improvement Act according to the consensus

	Able to convince others to implement his ideas in the meeting	Build good relationship with others		Delegate tasks in an effective manner Obtain operational inputs before making decision
Mohd Rahmat	Critical to others' views and argues if necessary	Highlight unsolved problem in the meeting Improve sharing attitudes	Obtain clarification from others	Involve in argument for confirmation Highlight issue in the meeting Interact with others for task improvement React to issue acutely and collectively to improve operation Obtain clarification from others
Mohd Syafawi	Gain confidence to communicate with others Develop others actively Establish formal and informal discussion in the unit Delegate task smoothly	Share work-related information actively Not shy to express ideas in the meeting	Feel responsible to ask experts to solve problem Solve problems through the medium of discussion Gain feedback to improve tasks and understand problems	Interact with staff to develop them Highlight issue in the formal or informal discussion Interact with others for task improvement Act according to the consensus Delegate tasks in an effective manner Refer unsolved problem to the expert
Mohd Syukri	Train staff to know their plans and aims Motivate staff to participate in the decision making process Delegate task smoothly and effectively	Create conducive working environment in the unit Build good relationship with others Share good values in the meeting Share work-related information actively Share the approach to undertake task with staff	Ask staff to brief the task progress Refer unsolved problem to the boss/experts Solve problem through the medium of discussion and dialogue	Interact with staff to develop them and unit Became confident to express ideas Interact with others for task improvement Seek participation from other members Act according to the consensus Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert
Mohd Wahyudi	Improve communication skills Delegate tasks better Able to influence others to adapt the proposed approach Encourage others to give ideas in the meeting	Express problems to the experts Gain confidence to express problem to the top people	Refer unsolved problem to the boss Solve problem through the medium of rational discourse	Establish rational discourse in solving problem Highlight concerns to the right people Gain confidence to convince others Seek participation from other members Actions are planned collectively Delegate tasks in an effective manner Refer unsolved problem to the expert React to issue acutely and collectively
Mohd Yazi	Coach staff actively Persuade others Motivate staff to participate in the decision making process Call for a meeting if necessary	Integrate with others to solve problem smoothly Create unity in the unit Share work-related information for task improvement	Solve problems through the medium of discussion Trust others in obtaining views Refer unsolved problem to the boss/experts Appreciate others' views	Interact with staff to develop them and unit Became confident to express ideas Interact with others for task improvement Seek participation from other members Act according to the consensus Obtain operational inputs before making decision Refer unsolved problem to the

				expert Call for a meeting if necessary
Mohd Zulmahri	Gain awareness to communicate with others Able to manage staff rationally Able to influence others to adapt the proposed approach	Build good relationship with others Share work-related information actively	Gain inputs for task improvements from others Obtain clarification from others actively	Interact with staff to develop them and unit rationally Gain confidence to convince others Interact with others for task improvement Apply task savvy to the situation Obtain clarification from others
Norazlan	Motivate staff to participate in the decision making process Convince others to adapt ideas through a high quality work Delegate tasks smoothly	Gain confidence to express problem to the top people Create integrity in the unit Share work-related information actively	Solve problem through the medium of discussion Gain confidence to obtain clarification from experts Ask others regarding the feasibility or practicality of personal views	Interact with others for unit development Highlight issues to the right people Interact with others for task improvement Seek participation from other members Leadership by example Act according to the consensus Apply task savvy to the situation Delegate tasks in an effective manner Obtain operational inputs before making decision Undertake comparative analysis before action
Nordin	Encourage others to participate in the daily operations	Share work-related information actively Create cohesion in the unit	Refer unsolved problem to the colleagues/experts	Interact with others for unit development Gain confidence to express ideas actively Interact with others for task improvement Seek participation from other members Refer unsolved problem to the expert Obtain clarification from others
Rosli	Delegate tasks smoothly and systematically Give advices to staff to improve performance individually Develop the newcomers	Share the approach to undertake task with staff	Do not shy to refer unsolved problem to the boss/experts Solve problem through the medium of discussion	Interact with staff to develop them Express ideas after examining causal relationship Interact with others for task improvement Act according to the consensus Act after prudent investigation Refer unsolved problem to the expert Delegate tasks in an effective manner Evaluate causal relationship before action
Ruzuan	Develop staffs' commitment actively Delegate tasks acutely to maintain cohesiveness Motivate staff to manage time well Improve communication skills	Create cohesion in the workplace Share work-related information actively Gain strength to express views to the top people	Do not shy to ask others to undertake tasks effectively Solve problem through the medium of discussion	Interact with staff to develop them and unit Highlight issues to the right people Interact with others for task improvement Act according to the consensus Delegate tasks in an effective manner
Samsulisam	Delegate tasks effectively Listen to others' views and act	Express views in the meeting Share work-related information actively	Gain feedback from the experts to improve skills	Interact with staff to develop them and unit Highlight views in the meeting Gain motivation for learning

	accordingly Develop others actively	Interact with others for developing a sound plan		Interact with others for task improvement React to issue acutely and collectively to improve operation Delegate tasks in an effective manner Visualise the risk of making mistakes
Shaarin	Able to influence others to adopt best approach Develop others actively	Express views to the boss Build good relationship with others Promote sharing culture in the unit Share work-related information actively	Refer unsolved problem to the boss/experts	Interact with staff to develop them and unit Highlight issues to the right people Gain confidence to convince others Interact with others for task improvement Act according to the consensus Know what should be done at every time Refer unsolved problem to the expert due to risk of making mistakes Visualise the risk of making mistakes
Susi	Improve communication skills Leadership by example Able to influence top people to accept new maintenance planning	Express views in the workplace actively Share work-related information actively	Refer to the right people for relevant inputs Solve problem through the medium of discussion	Express views in the workplace actively Gain confidence to convince others Interact with others for task improvement Leadership by example Act according to the consensus Obtain clarification from the right people
Tg Mahathir	Delegate tasks smoothly Coach staff actively Able to influence others to accept his view Give advices to staff to solve problem individually Motivate staff to participate in the decision making process	Share work-related information actively	Gain inputs from others for task improvement Refer unsolved problem to the boss	Interact with staff to develop them Gain confidence to convince others Interact with others for task improvement Seek participation from other members Act according to systematic and collective approach Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert
Yaakop	Reduce timidity or shyness to communicate with others Develop others actively Persuade others Delegate and coordinate tasks smoothly Give advices to staff to improve performance individually Motivate staff to reduce talking silly	Express views in the workplace actively Create cohesion in the unit Talk to others nicely Gain confidence to express workers' issues Share work-related information actively	Gain feedback to improve knowledge Solve problems through the medium of discussion Gain inputs from other units for improving task Do not hesitate to refer to the boss	Interact with staff to develop them and unit Interact with others for task improvement Express views in the workplace actively Gain motivation for learning Interact with others for task improvement Act according to systematic and collective approach Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the

	things Develop trust value amongst staff			expert Evaluate causal relationship before action Visualise the risk of making mistakes
Yumas	Encourage staff to implement collective decision Assist staff in establishing effective operations Improve communication skills Develop others actively Influence others through good outcome	Create cooperation amongst staff Talk to others nicely Remind others about the good practice Gain awareness to share knowledge and skills actively in the workplace	Solve problem through the medium of discussion Gain confidence to ask others	Interact with staff to develop them and unit Establish two ways communication to express or gain ideas Interact with others for task improvement Leadership by example Act according to systematic and collective approach Obtain operational inputs before making decision Evaluate problem collectively
Zaini	Develop others actively Persuade others	Share work-related information actively Able to express ideas in the meeting Create harmony in the workplace	Solve problem through the medium of discussion	Interact with staff to develop them and unit Express ideas in the meeting Interact with others for task improvement Act according to the consensus Undertake comparison analysis before action
Zainizam	Develop staff to feel responsible to the company Reduce shyness to communicate with others Able to convince others to implement his ideas in the meeting Develop the newcomers Give advices to staff to improve performance individually Others trust on her	Able to express ideas in the meeting Share work-related information actively Share problems with all members Create cohesion in the workplace	Obtain the information from the right people at the right time Solve problem through the medium of discussion	Interact with staff to develop them and unit Express ideas in the meeting Gain confidence to convince others Interact with others for task improvement Act according to the consensus Act according to systematic and collective approach Obtain operational inputs before making decision Contemplate inputs in depth before action
Zainol	Able to deal with the top people Gain confidence to communicate with others Assist the staff to solve the problem	Share work-related information actively	Refer problems to the right people to solve them Gain feedback to solve problem Gain feedback to evaluate the applicability or feasibility of own ideas	Interact with staff to develop them Highlight concerns to the right people Interact with others for task improvement Act according to the consensus Obtain operational inputs before making decision Refer unsolved problem to the expert Evaluate causal relationship before action
Zakaria	Develop the newcomers Become talkative type of person Delegate tasks smoothly Give advices to staff to separate personal stuff from official stuff	Express views in the meeting Express dissatisfaction in the meeting Involve others in the workplace Create cohesion in the workplace Share work-related information actively	Obtain clarification from others Learn from the experts Ask others to complete the tasks effectively Gain inputs to tackle the problems Gain inputs to evaluate own ideas	Interact with staff to develop them and unit Highlight issues in the meeting Gain motivation for learning Interact with others for task improvement Act according to systematic and collective approach Delegate tasks in an effective manner Obtain operational inputs

				before making decision Refer unsolved problem to the expert
Zulkipli	Reduce shyness in communicating with others Gain strength to argue with others if necessary Staff do not hesitate to seek for assistance and advices Instil awareness to communicate with others Motivate staff to contribute ideas	Share work-related information actively Build good relationship with others Create cohesion in the unit Highlight staffs' ideas in the meeting	Gain inputs from others to tackle the problems Refer unsolved problem to the top people Gain inputs to determine the causes of problem	Interact with staff to develop them and unit Involve in argument for confirmation Highlight issues in the meeting Interact with others for task improvement Seek participation from other members Obtain operational inputs before making decision Refer unsolved problem to the expert
Zuriana	Remind the staff about the high quality work	Experience marginal impact	Refer the problem to the boss/experts Gain inputs from the colleagues	Interact with staff to develop them Became confident to express ideas Know what should be done at every time Obtain operational inputs before making decision Refer unsolved problem to the expert

APPENDIX H

Respondents' Themes to Categories

Respondent	First Level Themes	Second Level Themes	Individual Category
Abdul Halim	Interact with others for unit development Express ideas in the meeting	Became confident to express idea for unit development in the meeting	Gain confidence to express ideas for unit development in the meeting
	Interact with others for task improvement Act according to the company's norms	Act according to collective approach and accepted procedures	Determine action according to the consensus and company's norms
	Refer unsolved problem to the expert Analyse the problem in depth before action	Obtain clarification before making decision	Obtain clarification before making decision
Abdul Rahim	Interact with staff to develop them and unit Highlight issue in the formal or informal discussion Gain motivation for learning	Became confident to express and internalise ideas in the discussion	Gain confidence to express and internalise ideas through collective discussion
	Interact with others for task improvement Aware of the approach whenever face problem	Act according to collective approach and accepted procedures	Act according to the consensus and accepted procedures
	Delegate tasks in an effective manner Analyse the problem in depth before action	Interpret what is happening in interpersonal situations	Interpret what is happening and determine action from interpersonal perspective
Amran	Interact with others for unit development Gain motivation for learning	Externalise and internalise ideas through collective discussion	Gain confidence to express and internalise ideas through collective discussion
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Obtain operational inputs before making decision	Obtain clarification before making decision	Obtain clarification before making decision
Anuar	Interact with staff to develop them and unit Became confident to express ideas	Became confident to express ideas in a collective manner	Gain confidence to express ideas in the workplace
	Leadership by example Act according to the consensus	Act according to collective approach and accepted procedures	Produce good results from the agreed action so that it could be emulated
	Refer unsolved problem to the right people Contemplate problem in depth before action	Obtain clarification before evaluating task	Evaluate the solution for any problem collectively
Azahari	Interact with staff to develop them and unit Express concerns to the top people actively	Became confident to express ideas to others for unit development	Feel responsible to express ideas and concerns for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Feel sensitive to unit development Refer unsolved problem to the expert	Obtain clarification before making decision	Feel concern with obtaining relevant inputs for making right decision
Azize	Interact with staff to develop them and unit Highlight issue in the formal or informal discussion	Became confident to highlight issue in the meeting for unit development	Gain confidence to express ideas for unit development

	Interact with others for task improvement React to issue acutely to improve operation Act according to the consensus	Willingness to face problem acutely and collectively for the sake of the company	Determine action acutely and collectively
	Delegate tasks in an effective manner Refer unsolved problem to the expert	Interpret what is happening in interpersonal situations	Interpret what is happening in interpersonal situations
Azmi	Highlight concerns in the meeting Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting	Gain confidence to influence others through sharing idea in the meeting
	Interact with others for task improvement Act according to mutual understanding	Act according to mutual understanding	Determine action according to mutual understanding
	Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert	Interpret what is happening in interpersonal situations	Obtain relevant inputs after interpreting what is happening in interpersonal situations
Fakhrurazi	Interact with others for unit development Became confident to express ideas	Became confident to express ideas for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Evaluate problem in depth before making decision Obtain operational inputs before making decision	Obtain inputs to enable problem solving deeply	Understand problem from a variety of sources before determining action
Hazis	Interact with others for unit development Became confident to express ideas	Became confident to express idea for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Act without compromising good relationship with others	Act without compromising good relationship with others	Determine action collectively
	Refer unsolved problem to the colleagues Analyse the problem in depth before action	Obtain clarification before proposing solution to the problem	Feel concern with obtaining relevant inputs for making right decision
Herlina	Interact with staff to develop them and unit Able to share idea in the rational discourse for solving problem	Became confident to express idea in the rational discourse for unit development	Gain confidence to express ideas for unit development collectively and rationally
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Obtain operational inputs before making decision Visualise the impact of the action from broad perspective	Interpret what is happening in interpersonal situations and other perspectives	Interpret what is happening and determine action from human and non-human perspectives
Ishak	Interact with others for task improvement Feel responsible to express ideas	Feel responsible to express ideas for unit development	Feel responsible to express ideas for unit development
	Leadership by example Act according to the consensus	Motivation to produce the best from the agreed solution	Produce good results from the agreed solution so that it could be emulated
	Refer unsolved problem to the colleagues	Refer unsolved problem to the colleagues	Refer unsolved problem to the colleagues

Kamal	Interact with staff to develop them and unit Highlight concerns to the right people Gain motivation for learning	Became confident to express and internalise idea for unit development	Gain confidence to express and internalise ideas or concerns for unit development
	Interact with others for task improvement React to issue acutely to improve operation Leadership by example	Motivation to produce the best from the undertaken solution	Produce good results from the collective decision so that it could be emulated
	Refer unsolved problem to the expert Visualise the risk of making mistakes	Evaluate risks and interpret what is happening in interpersonal situations	Evaluate risks and interpret what is happening in interpersonal situations
Mazalan	Interact with staff to develop them and unit Became confident to express ideas	Became confident to express ideas for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Act according to the consensus React to issue acutely and collectively to improve operation	Motivation to face problem acutely and collectively for unit development	Determine the action or reaction acutely and collectively
	Obtain operational inputs before making decision	Obtain operational inputs before making decision	Obtain operational inputs before making decision
Md Isa	Interact with staff to develop them and unit Highlight concerns to the right people	Gain confidence to express ideas and concerns actively	Gain confidence to express ideas and concerns for unit development
	Interact with others for task improvement Seek participation from other members	Act according to collective approach	Determine action collectively
	Obtain confirmation before making decision Refer unsolved problem to the expert Delegate tasks in an effective manner	Validate what is happening in interpersonal situations	Evaluate problem and validate solution based on the interpersonal perspectives
Mohamed Ridzuan	Experience marginal impact	Experience marginal impact	Experience marginal impact
	Interact with others for task improvement	Interact with others for task improvement	Interact with others for task improvement
	Obtain operational inputs before making decision	Obtain operational inputs before making decision	Obtain operational inputs before making decision
Mohd Adi	Interact with staff to develop them and unit Became confident to express ideas	Became confident to express ideas for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Act according to collective approach	Act according to collective approach	Determine action in a collective manner
	Question the rationale of the task Delegate tasks in an effective manner Obtain operational inputs before making decision	Read problems better	Read problems and obtain necessary inputs for reliable solutions and task delegation
Mohd Azmi	Interact with staff to develop them and unit Highlight concerns in the meeting Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas and concerns in the meeting for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively

	Delegate tasks in an effective manner Obtain operational inputs before making decision	Interpret what is happening in interpersonal situations	Interpret what is happening and determine action from interpersonal perspective
Mohd Rahmat	Involve in argument for confirmation Highlight issue in the meeting	Arguing for confirmation	Gain confidence to express ideas for argument in the meeting
	Interact with others for task improvement React to issue acutely and collectively to improve operation	Know what should be done when facing problem	Determine action or reaction acutely and collectively
	Obtain clarification from others	Obtain clarification from others	Obtain clarification from others
Mohd Syafawi	Interact with staff to develop them Highlight issue in the formal or informal discussion	Establish two ways communication to express or gain ideas for unit development	Establish two ways communication to express or gain ideas for unit development
	Interact with others for task improvement Act according to the consensus	Became adept at handling tasks in a collective manner	Became adept at determining action collectively
	Delegate tasks in an effective manner Refer unsolved problem to the expert	Read situation better	Read problems and obtain necessary inputs for reliable action
Mohd Syukri	Interact with staff to develop them and unit Became confident to express ideas	Became confident to express ideas for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Seek participation from other members Act according to the consensus	Act according to collective approach	Determine action collectively
	Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert	Evaluate inputs in depth before action	Obtain and evaluate inputs prudently before determining reliable solution or task delegation
Mohd Wahyudi	Establish rational discourse in solving problem Highlight concerns to the right people Gain confidence to convince others	Feel confident to express ideas	Gain confidence to express ideas and concerns rationally for convincing others
	Seek participation from other members Actions are planned collectively	Act according to collective approach	Determine action in a collective manner
	Delegate tasks in an effective manner Refer unsolved problem to the expert React to issue acutely and collectively	Evaluate the problem deeply and collectively before action	Obtain relevant inputs for reliable solutions acutely and collectively
Mohd Yazi	Interact with staff to develop them and unit Became confident to express ideas	Gain confidence to express ideas actively for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Seek participation from other members Act according to the consensus	Act according to collective approach	Determine action collectively

	Obtain operational inputs before making decision Refer unsolved problem to the expert Call for a meeting if necessary	Evaluate inputs in depth before action	Obtain and evaluate inputs prudently before determining reliable solutions
Mohd Zulmahri	Interact with staff to develop them and unit rationally Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas and concerns rationally for convincing others
	Interact with others for task improvement Apply task savvy to the situation	Know what should be done when facing problem or dealing with issue	Apply task savvy to determine actions
	Obtain clarification from others	Obtain clarification from others	Obtain clarification from others
Norazlan	Interact with others for unit development Highlight issues to the right people	Became confident to express ideas for unit development	Gain confidence to express ideas or issues to the right people for unit development
	Interact with others for task improvement Seek participation from other members Leadership by example Act according to the consensus Apply task savvy to the situation	Know what should be done when dealing with human or non-human issues	Apply task savvy to produce good results from the collective decision so that it could be emulated
	Delegate tasks in an effective manner Obtain operational inputs before making decision Undertake comparative analysis before action	Interpret what is happening in interpersonal situations	Obtain relevant inputs for interpreting, comparing and determining actions in interpersonal situations
Nordin	Interact with others for unit development Gain confidence to express ideas actively	Gain confidence to express ideas actively for unit development	Gain confidence to express ideas actively for unit development
	Interact with others for task improvement Seek participation from other members	Act according to collective approach	Determine action collectively
	Refer unsolved problem to the expert Obtain clarification from others	Obtain clarification from others	Obtain necessary inputs in a collective manner for evaluating problem
Rosli	Interact with staff to develop them Express ideas after examining causal relationship	Gain confidence to express ideas after understanding the problem	Express ideas after understanding causal relationship for unit development
	Interact with others for task improvement Act according to the consensus Act after prudent investigation	Act after undertaking prudent analysis and collective discussion	Determine action collectively and prudently
	Refer unsolved problem to the expert Delegate tasks in an effective manner Evaluate causal relationship before action	Evaluate problem collectively and meticulously	Evaluate inputs and causal relationship before determining reliable solutions or task delegation
Ruzuan	Interact with staff to develop them and unit Highlight issues to the right people	Became confident to express ideas for unit development	Gain confidence to express ideas or highlight issues for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine actions collectively
	Delegate tasks in an effective manner	Delegate tasks in an effective manner	Delegate tasks in an effective manner

Samsulisam	Interact with staff to develop them and unit Highlight views in the meeting Gain motivation for learning	Became confident to express or internalise ideas for unit development	Gain confidence to express and internalise ideas through collective discussion for unit development
	Interact with others for task improvement React to issue acutely and collectively to improve operation	Act or react according to the collective approach	Determine action or reaction acutely and collectively
	Delegate tasks in an effective manner Visualise the risk of making mistakes	Interpret what is happening in interpersonal situations	Evaluate risks and interpret what is happening in interpersonal situations
Shaarin	Interact with staff to develop them and unit Highlight issues to the right people Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas or convince others in the meeting for unit development
	Interact with others for task improvement Act according to the consensus Know what should be done at every time	Act according to collective approach and accepted procedures	Determine action according to the accepted procedures and consensus
	Refer unsolved problem to the expert due to risk of making mistakes Visualise the risk of making mistakes	Interpret what is happening in interpersonal and bad impact situations	Obtain clarification to evade risk of low quality job
Susi	Express views in the workplace actively Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas or convince others in the meeting for unit development
	Interact with others for task improvement Leadership by example Act according to the consensus	Act according to collective approach and accepted procedures	Produce good results from the collective decision so that it could be emulated
	Obtain clarification from the right people	Obtain clarification before making decision	Obtain clarification before making decision
Tg Mahathir	Interact with staff to develop them Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas or convince others in the meeting for unit development
	Interact with others for task improvement Seek participation from other members Act according to systematic and collective approach	Act according to collective and systematic approach	Determine action collectively and systematically
	Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert	Interpret what is happening in interpersonal and task situations	Interpret what is happening and determine action from interpersonal and task perspectives
Yaakop	Interact with staff to develop them and unit Interact with others for task improvement Express views in the workplace actively Gain motivation for learning	Gain confidence to externalise and internalise idea in the workplace actively	Gain confidence to express and internalise idea in the workplace actively
	Interact with others for task improvement Act according to systematic and collective approach	Act according to systematic and collective approach	Determine action collectively and systematically

	Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert Evaluate causal relationship before action Visualise the risk of making mistakes	Evaluate task according to its impact on and risk to the company in a collective manner	Evaluate task according to its impact on and risk to the company in a collective manner
Yumas	Interact with staff to develop them and unit Establish two ways communication to express or gain ideas	Establish two ways communication to express or gain ideas for unit development	Gain confidence to externalise ideas through discussion for unit development
	Interact with others for task improvement Leadership by example Act according to systematic and collective approach	Determine the accepted procedures in task implementation through systematic and collective approach	Determine the accepted procedures in task implementation through systematic and collective approach
	Obtain operational inputs before making decision Evaluate problem collectively	Evaluate problem through collective discussion	Evaluate problem through collective discussion
Zaini	Interact with staff to develop them and unit Express ideas in the meeting	Became confident to express ideas for unit development	Gain confidence to express ideas for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Undertake comparison analysis before action	Undertake comparison analysis before action	Undertake comparison analysis before action
Zainizam	Interact with staff to develop them and unit Express ideas in the meeting Gain confidence to convince others	Gain confidence to influence others through sharing idea in the meeting for unit development	Gain confidence to express ideas or convince others in the meeting for unit development
	Interact with others for task improvement Act according to the consensus Act according to systematic and collective approach	Act according to systematic and collective approach	Determine action collectively and systematically
	Obtain operational inputs before making decision Contemplate inputs in depth before action	Evaluate task issues from the rational and interpersonal perspectives	Evaluate task issues from the rational and interpersonal perspectives
Zainol	Interact with staff to develop them Highlight concerns to the right people	Gain awareness to express ideas and concerns actively	Gain confidence to express ideas and concerns actively for unit development
	Interact with others for task improvement Act according to the consensus	Act according to collective approach	Determine action collectively
	Obtain operational inputs before making decision Refer unsolved problem to the expert Evaluate causal relationship before action	Evaluate task issues from the rational and interpersonal perspectives	Evaluate task issues from the rational and interpersonal perspectives
Zakaria	Interact with staff to develop them and unit Highlight issues in the meeting Gain motivation for learning	Gain confidence to externalise and internalise ideas actively	Gain confidence to express and internalise ideas or concerns for unit development
	Interact with others for task improvement Act according to systematic and collective approach	Act according to systematic and collective approach	Determine action collectively and systematically

	Delegate tasks in an effective manner Obtain operational inputs before making decision Refer unsolved problem to the expert	Interpret what is happening in interpersonal and task situations	Interpret what is happening and determine action from interpersonal and task perspectives
Zulkipli	Interact with staff to develop them and unit Involve in argument for confirmation Highlight issues in the meeting	Gain confidence to express ideas actively for unit development	Gain confidence to express ideas and issues in the meeting actively for unit development
	Interact with others for task improvement Seek participation from other members	Act according to collective approach	Determine action collectively
	Obtain operational inputs before making decision Refer unsolved problem to the expert	Obtain clarification before making decision	Obtain clarification before determining action
Zuriana	Interact with staff to develop them Became confident to express ideas	Became confident to express ideas for unit development	Gain confidence to express ideas in the workplace for unit development
	Know what should be done at every time	Know what should be done at every time	Know what should be done at every time
	Obtain operational inputs before making decision Refer unsolved problem to the expert	Obtain clarification before making decision	Obtain clarification before determining action

APPENDIX I

The Construction of Major Categories

Major Category	Individual Category
The confidence to express ideas	Abdul Halim: Gain confidence to express ideas for unit development in the meeting Abdul Rahim: Gain confidence to express and internalise ideas through collective discussion Amran: Gain confidence to express and internalise ideas through collective discussion Anuar: Gain confidence to express ideas in the workplace Azahari: Feel responsible to express ideas and concerns for unit development Azize: Gain confidence to express ideas for unit development Azmi: Gain confidence to influence others through sharing idea in the meeting Fakhrurazi: Gain confidence to express ideas for unit development Hazis: Gain confidence to express ideas for unit development Herlina: Gain confidence to express ideas for unit development collectively and rationally Ishak: Feel responsible to express ideas for unit development Kamal: Gain confidence to express and internalise ideas or concerns for unit development Mazalan: Gain confidence to express ideas for unit development Md Isa: Gain confidence to express ideas and concerns for unit development Mohamed Ridzuan: Experience marginal impact Mohd Adi: Gain confidence to express ideas for unit development Mohd Azmi: Gain confidence to express ideas and concerns in the meeting for unit development Mohd Rahmat: Gain confidence to express ideas for argument in the meeting Mohd Syafawi: Establish two ways communication to express or gain ideas for unit development Mohd Syukri: Gain confidence to express ideas for unit development Mohd Wahyudi: Gain confidence to express ideas and concerns rationally for convincing others Mohd Yazi: Gain confidence to express ideas for unit development Mohd Zulmahri: Gain confidence to express ideas and concerns rationally for convincing others Norazlan: Gain confidence to express ideas or issues to the right people for unit development Nordin: Gain confidence to express ideas actively for unit development Rosli: Express ideas after understanding causal relationship for unit development Ruzuan: Gain confidence to express ideas or highlight issues for unit development Samsulisam: Gain confidence to express and internalise ideas through collective discussion for unit development Shaarin: Gain confidence to express ideas or convince others in the meeting for unit development Susi: Gain confidence to express ideas or convince others in the meeting for unit development Tg Mahathir: Gain confidence to express ideas or convince others in the meeting for unit development Yaakop: Gain confidence to express and internalise idea in the workplace actively Yumas: Gain confidence to externalise ideas through discussion for unit development Zaini: Gain confidence to express ideas for unit development Zainizam: Gain confidence to express ideas or convince others in the meeting for unit development Zainol: Gain confidence to express ideas and concerns actively for unit development Zakaria: Gain confidence to express and internalise ideas or concerns for unit development Zulkipli: Gain confidence to express ideas and issues in the meeting actively for unit development Zuriana: Gain confidence to express ideas in the workplace for unit development
The ability to determine and define actions and reactions	Abdul Halim: Determine action according to the consensus and company's norms Abdul Rahim: Act according to the consensus and accepted procedures Amran: Determine action collectively Anuar: Produce good results from the agreed action so that it could be emulated Azahari: Determine action collectively Azize: Determine action acutely and collectively Azmi: Determine action according to mutual understanding Fakhrurazi: Determine action collectively Hazis: Determine action collectively Herlina: Determine action collectively Ishak: Produce good results from the agreed solution so that it could be emulated Kamal: Produce good results from the collective decision so that it could be emulated Mazalan: Determine the action or reaction acutely and collectively Md Isa: Determine action collectively Mohamed Ridzuan: Interact with others for task improvement Mohd Adi: Determine action in a collective manner Mohd Azmi: Determine action collectively Mohd Rahmat: Determine action or reaction acutely and collectively Mohd Syafawi: Became adept at determining action collectively

	Mohd Syukri: Determine action collectively Mohd Wahyudi: Determine action in a collective manner Mohd Yazi: Determine action collectively Mohd Zulmahri: Apply task savvy to determine actions Norazlan: Apply task savvy to produce good results from the collective decision so that it could be emulated Nordin: Determine action collectively Rosli: Determine action collectively and prudently Ruzuan: Determine actions collectively Samsulisam: Determine action or reaction acutely and collectively Shaarin: Determine action according to the accepted procedures and consensus Susi: Produce good results from the collective decision so that it could be emulated Tg Mahathir: Determine action collectively and systematically Yaakop: Determine action collectively and systematically Yumas: Determine the accepted procedures in task implementation through systematic and collective approach Zaini: Determine action collectively Zainizam: Determine action collectively and systematically Zainol: Determine action collectively Zakaria: Determine action collectively and systematically Zulkipli: Determine action collectively Zuriana: Know what should be done at every time
The ability to reflect problem	Abdul Halim: Obtain clarification before making decision Abdul Rahim: Interpret what is happening and determine action from interpersonal perspective Amran: Obtain clarification before making decision Anuar: Evaluate the solution for any problem collectively Azahari: Feel concern with obtaining relevant inputs for making right decision Azize: Interpret what is happening in interpersonal situations Azmi: Obtain relevant inputs after interpreting what is happening in interpersonal situations Fakhrurazi: Understand problem from a variety of sources before determining action Hazis: Feel concern with obtaining relevant inputs for making right decision Herlina: Interpret what is happening and determine action from human and non-human perspectives Ishak: Refer unsolved problem to the colleagues Kamal: Evaluate risks and interpret what is happening in interpersonal situations Mazalan: Obtain operational inputs before making decision Md Isa: Evaluate problem and validate solution based on the interpersonal perspectives Mohamed Ridzuan: Obtain operational inputs before making decision Mohd Adi: Read problems and obtain necessary inputs for reliable solutions and task delegation Mohd Azmi: Interpret what is happening and determine action from interpersonal perspective Mohd Rahmat: Obtain clarification from others Mohd Syafawi: Read problems and obtain necessary inputs for reliable action Mohd Syukri: Obtain and evaluate inputs prudently before determining reliable solution or task delegation Mohd Wahyudi: Obtain relevant inputs for reliable solutions acutely and collectively Mohd Yazi: Obtain and evaluate inputs prudently before determining reliable solutions Mohd Zulmahri: Obtain clarification from others Norazlan: Obtain relevant inputs for interpreting, comparing and determining actions in interpersonal situations Nordin: Obtain necessary inputs in a collective manner for evaluating problem Rosli: Evaluate inputs and causal relationship before determining reliable solutions or task delegation Ruzuan: Delegate tasks in an effective manner Samsulisam: Evaluate risks and interpret what is happening in interpersonal situations Shaarin: Obtain clarification to evade risk of low quality job Susi: Obtain clarification before making decision Tg Mahathir: Interpret what is happening and determine action from interpersonal and task perspectives Yaakop: Evaluate task according to its impact on and risk to the company in a collective manner Yumas: Evaluate problem through collective discussion Zaini: Undertake comparison analysis before action Zainizam: Evaluate task issues from the rational and interpersonal perspectives Zainol: Evaluate task issues from the rational and interpersonal perspectives Zakaria: Interpret what is happening and determine action from interpersonal and task perspectives Zulkipli: Obtain clarification before determining action Zuriana: Obtain clarification before determining action

APPENDIX J

The Documentation of Ideas, Actions, Reactions and Reflections

Respondent	Comments	Proposed Person
Abdul Halim	Document based on priority and significant in future work improvement	Self documentation
Abdul Rahim	Agreed on documentation	Self documentation
Amran	Agreed on documentation	Knowledge steward
Anuar	Agreed on documentation	Self documentation
Azahari	Agreed on documentation	Self documentation
Azize	Documentation is important to understand subordinates task and in turn create teamwork spirit	Self documentation and knowledge steward
Azmi	Document something that is related to scope of work	Self documentation
Fakhrurazi	Agreed on documentation	Knowledge steward
Hazis	Agreed on documentation	Knowledge steward
Herlina	Documentation can provide inputs for future guidance	Self documentation
Ishak	Agreed on documentation	Self documentation
Kamal	Agreed on documentation	Self documentation
Mazalan	Agreed on documentation	Knowledge steward
Md Isa	Agreed on documentation	Self documentation
Mohamed Ridzuan	Agreed on documentation	Self documentation
Mohd Adi	Documentation should be based on need and context	Self documentation
Mohd Azmi	Documentation can be used as a medium to provide inputs for updating the system	Knowledge steward
Mohd Rahmat	Documentation can be used to predict future solution	Knowledge steward
Mohd Syafawi	Documentation provides valuable reference to understand target and responsibilities	Self documentation
Mohd Syukri	Documentation creates future reference and analysis for decision making	Self documentation
Mohd Wahyudi	Agreed on documentation	Self documentation and key in by system officer
Mohd Yazi	Documentation provides future reference for decision making	Self documentation
Mohd Zulmahri	Documentation provides future reference for decision making	Knowledge steward
Norazlan	Agreed on documentation	Self documentation
Nordin	Documentation provides relevant and reliable reference in the future	Self documentation
Rosli	Agreed on documentation	Self documentation
Ruzuan	Agreed on documentation	Self documentation
Samsulisam	Agreed on documentation	Self documentation
Shaarin	Agreed on documentation	Self documentation
Susi	Agreed on documentation	Knowledge steward
Tg Mahathir	Agreed on documentation	Self documentation
Yaakop	Documentation is relevant for the operational work	Self documentation
Yumas	Documentation can provide inputs for improving operations and performance	Self documentation
Zaini	Documentation is important because the incapability to memorise everything	Self documentation
Zainizam	Documentation can be used to develop a systematic future reference	Self documentation
Zainol	Agreed on documentation	Self documentation
Zakaria	Agreed on documentation	Knowledge steward
Zulkipli	Agreed on documentation	Self documentation
Zuriana	Documentation can become a reference in handling tasks	Self documentation