Knowledge management: 
An exploration of knowledge sharing 
within project-based organisations

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Abstract

For several years, knowledge has been treated as a key successful resource in business and management. As knowledge management has been researched in various research domains, academics in project management have been also interested in the potential role of knowledge management. The aim of the research is to explore the usefulness and potentiality of knowledge management as well as to confirm the influencing elements of knowledge sharing within project-based organisations.

This research implemented a qualitative research method which prompted an in-depth understanding of individual members’ perceptions towards knowledge sharing in project teams. In order to fulfil the methodological objective, the data were collected by using semi-structured interviews with 26 project managers from five project-based firms. The grounded theory method was adopted as the data analysis technique of this study. It allowed the researcher to explore and analyse the individuals’ perceptions of knowledge sharing and knowledge management. As a result, this study suggests four potential influencing factors of knowledge sharing, which are trust, relationship, motivation, and self-efficacy. The research data show that trust plays a role as a basic currency between members to share knowledge. Positive and affirmative relationships with other members will make it easy to share more knowledge and lead to better quality of knowledge. In this research, the informants also imply that members would be motivated to engage in knowledge sharing in respect to workload, culture, and remuneration. Lastly, one’s belief that one can achieve certain things -self-efficacy- is also important to create improved knowledge sharing between members in project teams.

The research found that the majority of the companies managed their knowledge and carried out knowledge sharing activities. However, most of them did not recognise that their behaviours were relevant to knowledge management. In this research, the author suggests that confirming precedent knowledge management and knowledge sharing activities should occur prior to adopting new approaches. Furthermore, this research explores the potential influencing factors that play a role as either enablers or barriers. Thus, project managers and management should be cautious and ensure that influencing factors are equally balanced. Due to the nature of qualitative research methods, the sample size is relatively small compared to quantitative methods such as a survey and a questionnaire. As a result, future studies will consider more data in order to enhance further applicability and utilisation of the research.
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Chapter 1   Introduction

1.1 Introduction

Knowledge has been treated as a key successful factor and a critical resource in business and management studies for quite a long time now. However, it has rarely been systematically managed knowledge and has been taken into account as a field of research for only a few decades. Drucker (1993) states the significance of knowledge in his book “Post-capitalist society” as “the basic economic resource is no longer capital, natural resources, nor labour. It will be knowledge”. In 1991, Nonaka presented the need for knowledge management (KM) through the observation of Japanese companies, such as Honda, Canon and Sharp. In addition, the UK government published the white paper “Our Competitive Futures: Building the Knowledge Driven Economy (DTI, 1998)”, and considers “the creation of knowledge-based economy” as a strategy in a central part of the government.

Knowledge management composes of several managerial activities, which are creation, acquisition, storing, sharing and transferring knowledge in an organisation to fulfil the purposes. The main purpose of knowledge management may be to gain competitive advantages, improve the performance level, achieve innovation, and develop new products and services faster than competitors (Davenport and Prusak, 1998; Gant, 1996; Robinson et al., 2005; Nonaka and Takeuchi, 1995; Collison and Parcell, 2004; Davis and Botkin, 1994). In the recent economic environment, as mentioned by Drucker (1993), knowledge is regarded as one of a corporation’s resources which has to be properly managed and controlled with rigorous managerial practices as with labour and capital. Thus, managing knowledge appropriately is becoming an emergent issue in the recent years just as effective management and distribution of natural resources, and the labour were a key component to achieve competitive edges in the late 18th to middle of the 20th century (Lubit, 2001; Gant, 1996; Oliver, 1997; Barney, 1991; Barney, 2002; Davenport et al., 1998; Johannessen and Olsen, 2003).

Recently, development of new products and services has been more complicated, and versatile so many firms have been pursuing for agile and flexible forms of organisations to react towards the recent trends of markets and customers (Turner, 2009; Turner and
Keegan, 1999; Keegan and Turner, 2001; Keegan and Turner, 2002; Hanisch et al., 2009; Hobday, 2000). Project-based organisations have become one of the typical organisational forms in modern management to meet the recent requirements as well as an integral part of the company’s business strategies. They are treated as a suitable organisational format to satisfy customers’ requirements by integrating several functional teams, and optimal utilisation of scarce resources (Ajmal and Koskinen, 2008; Gray and Larson, 2008; Kasvi, et al., 2003). In addition, there are growing interests in implementing project-based organisations in response to the changing of business environments. Many corporations had tried to extend the domestic market shares, and developed new products or services in order to conquer the national market in the previous era. On the other hand, the recent business atmospheres have been shifting from the conventional characteristics to globalisation, and unlimited competitions with the development of new information and communication technologies. Moreover, many organisations have been trying to enhance efficiency, and minimise redundancies and extra cost to maximise revenues. Hence, adopting project-based organisations is not a new experimental trial to enhance firms’ capability to preserve themselves but an optimal form of company to strive in fast-changing and fast-transforming economic atmosphere.

1.2 Problem statement

The concept of knowledge management has been broadly researched in business and management studies as a new paradigm, which knowledge is not the accumulation of know-how, insights and wisdoms but knowledge is one of a firm’s resources or assets to manage for achieving competitive advantages and leading the market (Gant, 1996; Lubit, 2001; Leonard, 1995; Choi et al., 2008; Sharkie, 2003; Grover and Davenport, 2001; Duffy, 2000). Despite conducting many researches in business and management, knowledge management is quite a newly emerging research area in project management research domain. That is, while lots of researches have concentrated on cost reduction, and timely delivery of projects, relatively few researchers have taken into account the significance of managing, storing, sharing, and utilising the knowledge during the projects execution (Egbu, 2004; Brookes et al., 2006). However, a number of researchers in the project management domain have paid attention to the importance of managing knowledge, and fairly large amount of researchers noticed its usability and application in this area. Thus, interests of knowledge management are growing, and knowledge
management in project management domain should be researched in an appropriate manner.

While many academics have been stressing the significant role of knowledge management in the recent years, there are also current debates that knowledge management is not a permanent fixture in academic studies for business and management. As past researches such as Total Quality Management (TQM), Quality Circle, and Business Processes Reengineering (BPR) had been proven good examples of fashions of researches in business and management, a number of academics and practitioners have claimed that knowledge management would disappear soon as such studies did. In other words, fads or fashions in business and management studies have many spotlights from various academics within the first five years and then the attentions towards them will be diminished rapidly during a couple of years (Ponzi and Koenig, 2002). Despite such disturbances and controversies over knowledge management, it has been placed in a solid position in an academia and various industries since knowledge has a long historical background and has discussed it as a popular subject in philosophy. Moreover, Ponzi and Koenig (2002) indicate that the number of published journal articles related to knowledge management has gradually increased. This would be one of obvious evidences for sustainable existence of knowledge management in business and management academic. Along with this academic support, the recent industry has changed from the traditional manufacturing industry to a knowledge-intensive industry, such as consulting, research and development, science, and engineering.

In addition, Sharp (2003) indicates three pitfalls to implementing knowledge management and he asserts that companies have to overcome these challenges in order to succeed in knowledge management initiatives or knowledge management projects. Firstly, the return on investment (ROI) knowledge management is relatively less than other management practices, such as reengineering, six-sigma, enterprise resource planning (ERP) and so forth. Moreover, the investments in knowledge management have often exceeded the original budget so many executives are hesitating to implement it (Cohen, 2006). Secondly, there may be countless unused or undiscovered knowledge to gain competitive edges and innovation in an organization prior to adopting knowledge management (Elliot and O’Dell, 1999; Fischer and Ostwald, 2001; King, 2005). However, firms are not willing to discover these valuable assets even though they have
not recognised the existence of them. Lastly, knowledge is intangible and difficult to calculate in numbers or other physical methods (Kalkan, 2008). Accordingly, the upcoming challenge is that we need to assess the true value of knowledge and to establish appropriate systems to measure the value of knowledge.

Despite critiques and pitfalls in terms of knowledge management in strategic management, business and management, researchers have paid attention to exploring and adopting knowledge management to project-based organisations. According to Ajmal and Koskinen (2008), they present two reasons for growing interests of knowledge management in a project-based context. Firstly, the features of recent projects are different from conventional projects, and project managers have to take into account the changed situations. The contents of projects have been growing more complex than ever before. Also, the products have needed more complicated technical and social relationships with project team members. Secondly, project members need to learn lessons that are already known from others or previous projects to develop new knowledge and enhance competences. Constant learning will make the corporations possible to acquire and assimilate knowledge that resides in organisational memory as well as to sustain competitive advantages. Thus, knowledge management is the only way to adjust these changing situations and achieve a firm’s sustainable success and innovation.

In summary, knowledge management is not an academic fashion or fad. It is actually becoming an institutionalised subject of research in various areas. However, the interests of knowledge management in project-based organisations have paid less attention compared to cost management, risk management or duration control. Despite little attention towards knowledge management in project management domain, it becomes one of the significant areas of researches, since projects are more complicated and complex. Hence, the researcher will conduct a research that explores the significance of knowledge management and its potential factors which will influence knowledge management and other relevant activities within project-based organisations.
1.3 Research Questions

The main research questions of this research project are to answer “Is knowledge management beneficial to project-based organisations” and “What are the influencing factors (i.e. barriers and enablers) of knowledge management within project-based organisations?” The following are additional research questions, which were derived from the main research questions.

1) What are the potential benefits of knowledge management in project-based organisations?
2) What is the most significant procedure of knowledge management in project-based organisations?
3) What elements will affect project team members attitudes towards knowledge management?
4) What are the project team members’ opinions and attitudes regarding knowledge management?
5) How knowledge management initiatives and activities would be improved from different managerial perspectives?

1.4 Research aim and objectives

The aim of the research is to explore the usefulness and potentiality of knowledge management as well as to confirm the influencing elements of knowledge sharing within project-based organisations. Accordingly, in order to fulfil the research aim of this study, the objectives of this study are described as follows:

- To research what knowledge management is and what the latest studies of knowledge management are from various subjects, (e.g. information and communication technology (ICT), business and management etc.) to establish the theoretical frameworks with particular concentration on storing, sharing and transferring step in knowledge management cycles
- To provide an exhaustive review of the researches on project-based organisations in order to define its position and to explore its significance in the recent economic environment
• To explore knowledge management and relevant studies in project management and project-based organisations study domains as well as to investigate the most significant process of knowledge management within project-based organisations
• To discover the key concepts that contributes to enhance knowledge sharing within project-based organisations in the form of a conceptual model.
• To discover constructs (concepts, categories, and core categories) and to generate the relevant comprehensive conceptual and practical model for enhanced knowledge sharing within project-based organisations
• To explore the roles and interactions amongst the constructs of the conceptual and practical model.
• To evaluate the significance of each construct of the conceptual model across the different types of project-based organisations
• To suggest the future research direction, and to propose the theoretical and practical recommendations as the basis for further development of enhanced knowledge sharing within project-based organisations

1.5 Scope of the research
The research explored knowledge management and influencing factors regarding knowledge sharing within project-based organisations. In particular, this study focused on knowledge sharing between project team members as well as potential influencing factors towards knowledge sharing. Using an exploratory grounded theory method, some of the potential influencing factors towards knowledge sharing in practice were explored. Since qualitative research methods pursue in-depth understanding regarding the studied phenomenon from small size of sample, it is difficult for findings of qualitative research methods to apply and implement in general manner. However, this research would be applied to most of project-based organisations because the data were collected from five project-based companies in three different industries.

1.6 Structure of the thesis
The structure of the thesis is composed of seven chapters and below you will find a short summary of these (See Figure 1.1).
Chapter 1. Introduction: This chapter introduces briefly the background of this research, the problem statement, aims and the scope of the research. In addition, it shows the research objectives arisen from the research questions, and presented the overall summarized structure of the thesis.

Chapter 2. Literature review: This chapter contains a general literature review of the topic, and also covers knowledge, knowledge management, knowledge sharing, and knowledge management in the project management domain. The main focus of this chapter is to observe knowledge management theories from the early stages to the state-of-the-art concepts. Moreover, it identifies key issues in the domain of the study to recognise the merits and demerits of the current researches in order to discover the future research possibilities.

Figure 1.1 The structure of the thesis
Chapter 3. Research methodology: This chapter mainly deals with the overall framework for research methodology, that is, differences between method and methodology, philosophical background of research methodology, the different types of research designs, and the selection of research method in this study. Following the general perspective of research methodology, it presents future research strategies that will be carried out during the PhD research.

Chapter 4. Data collection and coding procedure: This chapter presents the participating companies profiles as well as the overview of research interview participants. Moreover, the process of data coding is explained, and the initial themes are explored in order to identify their properties and dimensions. It also shows the conceptual model of this study.

Chapter 5. Data analysis: The extended and in-depth analysis of data based on the initial coding is presented in this chapter. The emergent findings from the collected data suggest the four core categories which would be potential enhancements of knowledge sharing in the project-based organisations. In addition, this chapter examines each of the core categories within all three participating companies, which will then provide a detailed understanding.

Chapter 6. Discussion of findings: This chapter explores and discusses the research findings in chapter 5. These findings are then compared with the existing literature, and explained in the theoretical and practical model in order to determine the position of this study in the project management domain. In addition, the storyline of the theory is provided to generate the final theoretical model of this study.

Chapter 7. Conclusions: This chapter finalises with a brief review and conclusion of the research project. Theoretical and practical contribution, and the limitations of this study are described. Finally, the explanation for future researches is also presented in this chapter.
Chapter 2  Literature review: Theoretical background

2.1 Introduction

Knowledge management itself may not be contemporary, but we can trace it back to the ancient Greeks as a form of disciplinary philosophy (Wig, 2000). However, it is only during the 1990s that knowledge management attracted a lot of theorists and practitioners as a strategic management activity to gain competitive advantages. Knowledge management in its current form initially received a significant attention in 1995, with the publication of the book ‘The knowledge-creating company’ (Nonaka and Takeuchi, 1995), which emphasised the advantages of Japanese approaches to innovation through the famous SECI model (i.e. socialisation, externalisation, combination, and internalisation). Since then an issue of ‘knowledge creation’ conceptualised by Nonaka has been the centre of the debate, while a number of other management theorists broadened the discipline of ‘knowledge’ in their studies of business organisations.

In a fundamental reappraisal of the theory of the firm, researches led by Grant (1996) and Spender (1996) have considered the potential role of knowledge as a heterogeneous asset in a ‘resource-based’ view of the firm. Brown and Duguid (1998) and others have maintained the role of ‘communities of practice’ and related sociological concepts. Pragmatic management consultants such as Davenport and Prusak (1998) also note that the only sustainable competitive advantage in a firm has come from what it collectively knows, how efficiently it uses what it knows, and how readily it acquires and uses new knowledge. The information technology industry has also suggested some ‘solutions’, although on occasions its claims to manage knowledge, rather than information, are overemphasised. Some scholars interpret knowledge management as the extension from an organisational learning theme saying that knowledge management has not replaced the organisational learning, rather than they are part of some genre.

Along with these growths of attention towards knowledge management from academics (Holsapple, 2003), a growing number of organisations are embracing knowledge management as a key strategic initiative. As a result of this development, many organisations have a better understanding of knowledge management and its benefits that
can be derived. This chapter will address the topics and theories, which have been evolved in the stream of knowledge management literature.

2.2 Definition of knowledge

There are various definitions of knowledge from various research areas such as ancient Greek philosophers, psychologists, cognitive scientists, and most recently management theorists. Nevertheless there seems to be little agreement on the definition of knowledge by academics as well as practitioners. Most economic theories have also treated knowledge, as an important factor in economic phenomena, either explicitly or implicitly. However, the way knowledge is treated differs depending on the emphasis put on knowledge, the type of knowledge to which attention is paid, and the ways to acquire and utilise it.

The main points of knowledge have been developed in two categories, which are namely a scientific and humanistic approach. The scientific researches have dealt with scientific management strategies, while the humanistic approach has been studied through human relationships. The former approach, which is scientific researches, has been pursued more divergent and evolved paths by information and communication technologies. On the other hand, the latter approach has been developed by the organisational sense and organisational culture aspect. Since the mid-1980s, a new attempt at synthesising the scientific and humanistic approaches appeared. Peter Drucker can represent these attempts and he coined the term ‘knowledge worker’ as early as the 1960s together with terms like ‘knowledge society’ in his book of ‘Post-capitalist Society’. Theories of organisational learning and core competencies approaches also affected this new conceptualisation of knowledge perspective, the former led by Senge (1990) and the latter by Prahalad and Hamel (1990).

Spender (1994) suggests four types of knowledge that are associated in two dimensions: individual versus collective knowledge and explicit versus tacit knowledge. The framework is noted for the dynamism of interplay between the types of knowledge. This has proved to be an attractive perspective to strategists, largely because the concepts of tacit knowledge and collective knowledge have gained popularity. Nonaka and Takeuchi (1995) define knowledge as ‘justified true belief’, which is apparently a disciplinary
interpretation impacted by Western philosophy. They note that knowledge is created, organised and transferred by the commitment and belief patterns of its holders and its recipients, who transmit their culture-specific sets of values and frames of reference. It is the receiver who decides whether the communication he or she receives it truly information or knowledge.

De Long and Fahey (2000) note that a major source of confusion about knowledge and knowledge management is resolved if we recognise that there are at least three distinct types of knowledge: human knowledge, social knowledge and structural knowledge. Human knowledge constitutes what individuals know, that is manifested in important skills and usually comprises both explicit and tacit knowledge. It could be conceptual or abstract in orientation. Social knowledge exists in relationships among individuals or within groups. Social or collective knowledge is largely tacit, composed of cultural norms that exist as a result of working together and its salience is reflected in our ability to collaborate and develop transactional relationships. Structured knowledge is embedded in organisation systems, process, rules and routines. According to De Long and Fahey (2000), this kind of knowledge is explicit and rule based and can exist independently of the human knower.

![Figure 2.1 Differences between knowledge and information (Source: Wiig, 2000)](image)

Skyrme (1999) points out that organisations focus on a few knowledge ‘levers’ that amplify their efforts and result in better organisational performance. According to
Skyrme, the kind of knowledge required for professional services are customer knowledge, knowledge in process, knowledge in people, organisational knowledge and knowledge in relationships (Skyrme, 1998; Skyrme, 2011). There are numerous definitions of knowledge depicted as shown on Table 2.1. As seen in the table, the concept of knowledge shows a variety of perspectives both on theoretic as well as on practical side (e.g. Ernst and Yong, McKinsey & Co., and KPMG). Based on these various definitions, knowledge is created, restructured, and changed from information. Information only becomes knowledge when somebody applies his or her intelligence to transform it.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liebeskind (1996)</td>
<td>Information of which validity has been established through tests of proof</td>
</tr>
<tr>
<td>Sveivy (1997)</td>
<td>A capacity to act, which is created continuously by a process-of-knowing</td>
</tr>
<tr>
<td>Davenport and Prusak (1998)</td>
<td>Function of framed experiences, values, context and expert insight that enables the evaluation and incorporation of new experiences an information</td>
</tr>
<tr>
<td>Leonardo and Sensiper (1998)</td>
<td>Relevant, actionable information based at least partially on experience</td>
</tr>
<tr>
<td>Fahey and Prusak (1998)</td>
<td>Imbuing data and information with decision-and action-relevant meaning</td>
</tr>
<tr>
<td>McKinsey &amp; Co. (2001)</td>
<td>The understanding of relations and causalities, essential in making operations effective, building business processes, or predicting the outcomes of business models</td>
</tr>
<tr>
<td>KPMG (2004)</td>
<td>What can be accumulated in people’s mind or in electronic form, about customers, products, processes and competitors etc.</td>
</tr>
</tbody>
</table>

Table 2.1 The various definitions of knowledge

Wiig (1997a, and 1997b) defines that “knowledge consists of facts, truths and beliefs, perspectives and concepts, judgements and expectations, methodologies and know-how whereas information consists of facts and data organised to describe a particular situation or condition” and he concludes that “in our view, the progression from signal, data, information, knowledge and wisdom may be a continuum with many grey area but these grey cases typically become clearer when considering how the “information/knowledge”
Sveiby (1997) comments that “the English language lacks the distinction common in most other languages between knowledge as facts and knowledge as abilities” and further asserts that “to overcome this problem the British philosopher Gilbert Ryle in 1949 coined knowledge as facts ‘know-that’ and knowledge as ability ‘know-how’ and the Hungarian/British philosopher Michael Polanyi, who first coined the label ‘tacit knowledge’ influences my own view on knowledge by saying that knowledge in as activity that is best described as a process of knowing”.

On a practical level, people used to interchange terms between knowledge and information. However, it is apparent that academics are more sensitive and strict to the distinctions among data, information and knowledge. For instance, Skyrme (1999) suggests differences between information and knowledge as described in Table 2.2.

<table>
<thead>
<tr>
<th>Information</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangible</strong></td>
<td>Human process or thinking and awareness</td>
</tr>
<tr>
<td><strong>Processing changes representation</strong></td>
<td>Processing changes consciousness</td>
</tr>
<tr>
<td><strong>Physical objects</strong></td>
<td>Mental objects</td>
</tr>
<tr>
<td><strong>Context independent</strong></td>
<td>Context affects meaning</td>
</tr>
<tr>
<td><strong>Entity</strong></td>
<td>Awareness and intuition</td>
</tr>
<tr>
<td><strong>Easily transferable</strong></td>
<td>Transfer requires learning</td>
</tr>
<tr>
<td><strong>Reproducible at low cost</strong></td>
<td>Not identically reproducible</td>
</tr>
</tbody>
</table>

Table 2.2 Difference between information and knowledge (Source: Skyrme, 1999)

According to a knowledge management consultant Charles H. Green (See http://www.km-forum.org/t000008.htm), information, knowledge and wisdom is defined as follows: information is raw, that is, un-acted upon by any receiver; knowledge is information acted upon cognitively, that is, transformed into some conceptual framework and hence usable for other cognitive uses; wisdom is applied knowledge, that is, knowledge along with the common sense to know when and how to use it. By the notion knowledge implies a solitary action, capable of being taken in the abstract by any one individual. The addition of wisdom implies the addition of experience. Experience is a
cumulative matter; it may refer to an individual’s own experience or to the collective experience of more than one individual information-processing perspective, knowledge is neither data nor information as discussed above.

Staples et al. (2001) indicate that data are transaction-oriented, while information is data drawn into patterns to reduce uncertainty. The term information and knowledge are often used interchangeably, but there should be clear differentiation between them. Knowledge resides not only in people’s minds but also in organisational behaviour in a collective way, and it can be transformed to other utilisation, such as books, technology, practices and tradition within organisations of all kinds and in society in general. The conceptual Figure 2.2 shows the structure amongst data, information, and knowledge. So far reviewing the literature, the definition of knowledge put down as ‘experiences, values, context information, and expert insights that reside within the individual and organisation’
2.3 Dimension of knowledge

There have been many debates of dimension of knowledge and explicit versus tacit dimension concerns how well articulated or implicit the knowledge is. Polanyi (1967) notes that “we know more than we can tell”. Knowledge is often highly personal in nature, difficult to communicate and express (Polanyi, 1967), highly specialised and not always valuable to others or easily transferred or shared among organisation members. Chi (1994) defines the term tacit as the inexpressible component of knowledge and its existence relies on learning by doing. Tacit knowledge is broadly defined as practical know-how or common sense strategies for successfully performing one’s job. Lubit (2001) categorises tacit knowledge into four types: hard-to-pin-down skills, that is, know-how; mental models or schema; ways of approaching problems; and organisational routines. Wagner (1994) surmises that tacit knowledge is primarily acquired through direct experience or through interactions with and experienced person. This knowledge is tacit in the sense that it is unspoken, gleaned informally on the job with limited environment support, that is, without the aid of a formal instruction. In addition, Sternberg et al. (1995) mention that tacit knowledge is usually poorly conveyed because it is not explicitly taught and hard to formulate. According to Sternberg et al. (1995), the acquisition and use of tacit knowledge is uniquely important for competent performance in real world contexts. Nonaka and Takeuchi (1995) contend that the most critical function is not the managing of existing knowledge but the creation of new knowledge, or learning. They describe this in terms of a gradual evolution in the organisational cultural paradigm.

Nonaka and Takeuchi (1995) describe knowledge-creation imperative as a dynamic and continuous process involving the acquisition, accumulation, creation and exploitation of new knowledge. The essence of the knowledge creation process is the conversion from tacit to explicit, which is socialisation procedure in SECI model suggested by Nonaka and Takeuchi (1995). Spender (1994) also states the assimilation of knowledge through a process of ritual socialisation is the crucial process in knowledge management. Nonaka and Takeuchi (1995) indicate human knowledge is created and expanded through social interaction between tacit and explicit knowledge. The process proposed by Nonaka and Takeuchi characterises as follows: socialisation, externalisation, internalisation and combination. Socialisation is the process to share and combine tacit knowledge within an
organisation. Externalization is defined as the process of articulating tacit knowledge into explicit via such as metaphor, analogy, hypotheses or models. Internalisation is defined as the process of embodying explicit knowledge into tacit knowledge through socialisation. Combination is the process to put the knowledge created in the firm into the repository. Nonaka and Takeuchi (1995) argue that the interaction between tacit and explicit knowledge is performed by the individual employee rather than by the organisation. The best behaviour, which could be done by the organisation, is to set up and encourage individuals. The characteristics of tacit and explicit knowledge are depicted in Figure 2.3.

![Types of Knowledge](image)

**Figure 2.3 Types of knowledge**

### 2.4 Knowledge management

#### 2.4.1 Definition of knowledge management

When it comes to the definition of knowledge management, there seems to be numerous interpretations among the authors. Table 2.3 summarises different definitions of knowledge management. As seen in the table, the definition of knowledge management is also various as is the case with the definition of knowledge. The lack of common
definition of knowledge management is due to the fact that knowledge is a complex, multidisciplinary and philosophical concept. In addition, the lack of common definition of knowledge management is also the case with the firm as it can be viewed differently by a various people depending on the experience, background and seniority of the person under the knowledge management. For example, knowledge management can be interpreted as the measurement and tracking of intellectual capital in the firm to the CEOs or executives. Knowledge management may mean the consolidation of the best practice and the enhancement of customer satisfaction to middle managers. Employees will interpret knowledge management that can lead to less time consumption, higher quality and productivity.

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gore and Gore (1997)</td>
<td>Creating an association between knowledge and action and managing the organisational change resulting from that association</td>
</tr>
<tr>
<td>Blair (1997)</td>
<td>Knowledge management aims to capture the knowledge that employees really need in a central repository and filter out the surplus.</td>
</tr>
<tr>
<td>Duffy (2000)</td>
<td>A process that drives innovation by capitalising on organisational intellect and experience</td>
</tr>
<tr>
<td>McKenzie &amp; Co. (2001)</td>
<td>Conscious and systematic decision-making about the best use of knowledge resources under uncertainties to achieving lasting improvement in an organisation’s performance</td>
</tr>
<tr>
<td>Dunn (2004)</td>
<td>The policy and processes, through which organisations seek to create, capture, store, disseminate and leverage organisational knowledge.</td>
</tr>
</tbody>
</table>

Table 2.3 Various definitions of knowledge management (Source: Various)

Despite broad recognition of knowledge management, there may be confusions between knowledge management and information management (Terra and Angeloni, 2003). As we have discussed the differences among data, information and knowledge, we would also like to define the differences between information management and knowledge management. Information management is a technology driven approach for data processing, while knowledge management is rather than a human-centric approach for proposition. Information management is pursuing the efficiency of existing processes, while knowledge management is in the pursuit of innovation of existing processes to create new value. Information management may normally be initiated by an information
management team in an organisation in order to control the work flows and information flows. On the other hand, knowledge management may focus on the personal point of views and control of value added information, that is, knowledge. Furthermore, knowledge management requires a variety level of participations from the lowest position of employees to the executives. Therefore, knowledge management has a dynamic nature to acquire, converse, apply and protect the knowledge not only for individual use but also for corporate level sharing. However, information management, is largely in static nature to collect, classify, accumulate and disseminate the information in the storage and processing level. Table 2.4 shows differences between information management and knowledge management.

<table>
<thead>
<tr>
<th>Information management</th>
<th>Knowledge management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approach</strong></td>
<td></td>
</tr>
<tr>
<td>Technology-driven</td>
<td>Human-centric</td>
</tr>
<tr>
<td><strong>Aims</strong></td>
<td></td>
</tr>
<tr>
<td>Data processing</td>
<td>Value proposition</td>
</tr>
<tr>
<td><strong>Pursuit</strong></td>
<td></td>
</tr>
<tr>
<td>Efficiency of existing process</td>
<td>Innovation and reengineering of existing process</td>
</tr>
<tr>
<td><strong>What to share</strong></td>
<td></td>
</tr>
<tr>
<td>Data and information in explicit forms</td>
<td>Tacit and explicit knowledge</td>
</tr>
<tr>
<td><strong>Main activities</strong></td>
<td></td>
</tr>
<tr>
<td>Storage and processing</td>
<td>Collaboration and sharing</td>
</tr>
</tbody>
</table>

Table 2.4 Differences between information management and knowledge management

There are different definitions of knowledge management by researchers, as seen in Table 2.3. In spite of variety of definitions on knowledge management, it is common that knowledge management is a connection of people-to-knowledge to create a competitive advantage in changing economic environments. Knowledge management can be defined as a systematic process to identify, create and share various and available knowledge within an organisation. Moreover it is the subsequent control and protection of actions to develop the knowledge assets to fulfil the organisational objectives.
2.4.2 Objectives of knowledge management

The objectives of knowledge management may vary with respect to a company’s size, an executive’s preferences, corporate cultures and so on. The common consensus of the objective of knowledge management is to enhance knowledge management underlying activities, which are creating, storing, transferring, and sharing so that an organisation will act as intelligently as possible to secure its viability and overall success or to realise the company’s the best value of knowledge assets to attain competitive advantage (Wiig, 1997a). According to Davenport et al. (1998), they point out that the most significant objectives of knowledge management are treating knowledge as a valuable firm’s asset, enhancing knowledge-friendly corporate culture, creating knowledge repositories, and improving the knowledge access. Braganza and Möllenkramer (2002) indicate the objectives of knowledge management are to establish a faster and more effective system in order to respond to customers’ requirements turning into new products. Chua and Lam (2005) state the common expectations from knowledge management as: improve business process; gain competitive advantage; and financial savings, and earning more revenues. Hanisch et al. (2009) summarise the objectives of knowledge management in five categories:

1) Increasing work efficiency and reducing risk by capitalising the experience gained during other projects and applying knowledge acquired during earlier projects
2) A continuous learning process throughout the overall project work that constantly revises, develops and implements
3) Continuous improvement of work processes and performances
4) The favourable staffing and allocating resources
5) The identification and fostering of innovation

Variety of knowledge management objectives by academics are summarised in Table 2.5. Although variety of academics have stated the objectives of knowledge management, it is common that the most crucial objective is to establish an appropriate knowledge reservoir to prevent leakages of valuable knowledge in unlimited competitive era. Besides, enhancing the accessibility and usability of created knowledge repository within members is also essential goal for knowledge management.
<table>
<thead>
<tr>
<th>Author</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| Wiig (1997)                  | • Enhancing underlying KM activities  
                              | • Acting as intelligently as possible  
                              | • Attaining competitive advantage |
| Davenport et al. (1998)      | • Treating knowledge as a firm’s value  
                              | • Enhancing knowledge-friendly culture  
                              | • Creating knowledge repositories  
                              | • Improving knowledge access |
| Braganza and Möllenkramer (2002) | • Establishing a faster and more effective systems to respond customers’ requirements |
| Chua and Lam (2005)          | • Improving business processes  
                              | • Gaining competitive advantage  
                              | • Saving financial revenues and earnings |
| Hanisch et al. (2009)        | • Increasing efficiency and reducing risks  
                              | • A continuous learning processes  
                              | • Continuous improvement of work processes and performances  
                              | • Favourable staffing and allocation of resources  
                              | • Identifying and fostering innovation |

*Table 2.5 The objectives of knowledge management*

**2.4.3 The orientation of knowledge management**

Knowledge management researches are divided into two streams of concept, namely process of knowledge management and the nature of knowledge management. The former is called the Polanyists and stresses the importance to the process of knowing, while the latter is named as the Davenportists and assimilates of knowledge as a superior level of information in a value chain. In other words, process study lays emphasis on process, which is knowing or learning, while the latter focuses on the nature of objects, that is knowledge contents. Similar to this dichotomy, Loma (2004) uses other terminology as Culturalists versus Intellectual capitalists. According to Loma (2004), Culturalists are stressing the importance of knowledge from soft factors such as culture, values, schema, belief systems, tacit norms, embedded routines and so forth. However,
Intellectual capitalists are those who are more concerned with result-oriented output of knowledge, which is quantifiable, formal, objective, explicit and measurable.

The vast majority of the researches in knowledge management have focused on one or more processes. The resource-based view is closely related to the issues of processes to protect the intellectual capital. The knowledge-based view mainly deals with the knowledge integration and coordination, which are aligning with managing process issues. The details of each perspective-resource-based view, and knowledge-based view will be discussed in the following section. Another stream of knowledge management approach focuses on the infrastructure. With the emergent of information and communication technology, facilitating or establishing knowledge management systems (KMS) has much attraction for this type of research. Through the information and communication technology, a number of organisations are able to systematically construct a knowledge management framework. However, these technological supports are restricted to merely managing information rather the knowledge. In addition, researchers in this perspective have focused on organisational structures and systems to encourage sharing and collaboration across boundaries within the organisation.

2.4.4 Different perspective of knowledge management

In the previous section, I discussed the basics of knowledge management, which includes definition of knowledge, dimensions of knowledge, definition of knowledge management, and its orientation. In the previous literature research, I grouped the knowledge management a stream into four categorises: resource-based view; knowledge-based view; learning organisation; and social capital theory. The following section discusses four different approaches of knowledge management perspectives in details.

2.4.4.1 Resource-Based view

Resource-based view is mainly focusing on a firm’s resources and capabilities to understand business strategies and to provide directions to the strategy formation. In this view, knowledge is treated as a strategic asset with the potential to be the source of sustainable competitive advantages for an organisation. Researchers have paid attention to the imperfect nature of the market, and accordingly predict that competitive firms will
possess heterogeneous resources and capabilities that show imperfections in imitation, substitution and mobility.

Barney (1991) depicts four criteria that enable a resource to be the basis for a sustainable competitive advantage in an organisation. According to Barney (1991), it must be “valuable, rare, imperfectly imitable and not strategically sustainable”. Among these characteristics, the last two are significant to protect the knowledge resources from competitors. These attributes are derived from the casual ambiguity, path dependence and tacit nature of knowledge. Casual ambiguity refers to the ambiguous relation to among the resources, capabilities and competitive advantage. This ambiguity inevitably happens as invisible asset, teamwork among the top management and corporate culture (Barney, 1986) are not imitable. Another casual ambiguity can be found from the fact that leading factors behind the competitiveness are not simple a mixture of certain resources but are an outcome of interconnectedness for numerous resources and capabilities (Diericks et al., 1997). Path dependence refers to the time dimension of resource accumulation as it takes time for a firm to acquire and accumulate the resources and capabilities, thus making it difficult or at least cost-ineffective for other competitors to replicate this path, if not impossible (Hirshleifer and Coll, 1988). Social complexity refers to the complexity, which cannot be easily imitated or substituted, as illustrated in the case of ‘corporate culture’ (Barney, 1986) and ‘corporate reputation’ (Porter, 1980; Porter, 1985).

Resource-based academics focus on barriers or difficulties to flow out of tacit knowledge across boundaries. The tacit nature of knowledge is a more frequently used concept as a source of competitive advantage in knowledge management. Tacit knowledge refers to the implicit know-how that a firm has developed and cultivated, which is empirical and resided in the employee’s brain, obtainable through only individual experience (Nonaka, 1994). Therefore, tacit knowledge has been treated as difficult to share with others and difficult to be transferred. Within the resource-based view, the focus is more placed on the content of the knowledge. In addition, knowledge in the resource-based view can serve to be the source of sustainable competitive advantage for a firm to the extent that it meets the criteria, which are difficult to imitate and replicate (Barney, 1991). In this point, we can say that the theoretical source of the competitive advantage shifts from the position of a firm in the market to the internal evaluation of the firm’s resources. In
addition it provides interesting concepts and perspectives of knowledge management. This theory mainly has developed to discover barriers or difficulties of knowledge transfer based on the tacit knowledge rather than the whole process of managing knowledge so it can espouse the attention to the protection of intellectual capital.

On the other hand, McGrath et al. (1992) criticise the resource-based view for inadequate practical management guidance. They assert, “as yet it offers little theory which would help a strategist make a particular decision, let alone establish a sufficiently consistent stream of such decisions as to be termed strategic”. The literature-based the resource-based view is quite focused and concerns parts of strategies rather than whole. Thus understanding of how a firm can effectively develop and implement a comprehensive strategy is far from perfect.

2.4.4.2 Knowledge-Based view

The Knowledge-Based View has been derived from the Resource-Based View on sources of competitive advantages developed within the strategic management literature. While the resource based view proposes that an organisation’s competitive advantage is derived from those valuable and unique resources that are costly for competitors to imitate, the knowledge based view focused on knowledge-related resources such as distinctive skills and routines as the most significant resource for establishing a dynamic capability or a competence. Thus, within this perspective emphasis is placed on internal processes and production arrangements. Researches within knowledge-based view assume that the firm’s ability to make the best use of dispersed and tacit knowledge relies on organisational capabilities, routines and firm-specific repository of resources.

Gant (1996), who apparently represents the knowledge-based view, discusses the aspects to knowledge integration and coordination capabilities that are a source of competitive advantage for a firm. According to Gant (1996), there are three phases to knowledge integration, which are efficiency of integration, scope of integration and flexibility of integration. In his work, the fundamental task of any organisation is to coordinate the knowledge and efforts of many individuals in the firm. This is achieved through the four mechanisms: rules and directives; sequencing; routines; and group problem solving and decision making. Rules and directives are impersonal and involve plans, scheduling,
forecasting, rules, policies and procedures, and a standardised means of communication through a common language. Sequencing involves organising activities in a time-patterned sequence so that each process input occurs independently in a specific time slot. An organisational routine is a complex pattern of behaviour that functions as a relatively autonomous recognisable unit. While a routine may be a simple sequence, it can support the complex interactions of individuals that are required for knowledge creation. Finally, the necessity for group problem solving and decision-making increases with complexity and is also achieved through the social interaction of individuals.

The basic assumption of knowledge-based view is that a firm must have effective means of coordinating the activities of individuals as well as integrating their knowledge in order to manage knowledge on a firm level. However, this perspective does not recognise the social problems and it is implicitly assumed that no conflicts of interest exist. Additionally, this perspective does not take into account organisational infrastructure such as culture, technology, and organisational structure with respect to the ability to support the knowledge management activities in the firm. This perspective stresses the importance of knowledge integration or coordination as an effective application of knowledge as a core competence.

2.4.4.3 Learning organisation perspective

There are many perceptions of the learning organisation, and all of them are depending on the researchers’ perspectives. Ellinger and Bostrom (1999) take into account learning organisation as a new management paradigm or a new perspective on learning. Kofman and Senge (1993) indicate that learning organisations as places where each individual in the organisation is accepted as a “learning being”. Furthermore, Nonaka’s concept of “The Knowledge-creating Company” might be treated as an extension of organisational learning because he mentions that everyone in the company must be a knowledge worker in order for achieving a sustainable competitive edge against competitors.

Gephart et al. (1996) point out that the learning organisation places emphasis on creating and capturing knowledge so that people who will need it can access and utilise it quickly. In addition, people within learning organisations are encouraged to think systematically and critically so that useful feedback is provided to the organisation. Gephart et al.
(1996) indicate that people are free to take risks, to experiment and to innovate in the learning organisation. Garvin (1993) says, “Organisational learning can usually be traced through three overlapping stages. The first step is cognitive. Members of the organisation are exposed to new ideas, expand their knowledge, and begin to think differently. The second step is behavioural. Employees begin to internalise new insights and alter their behaviours. And the third step is performance improvement, with changes in behaviour leading to measurable improvements in results”.

Marquardt and Watkins (1993) define learning organisations as those of a climate, which accelerates individual and group learning, and learning organisations teach their employees the critical thinking process for understanding what they do and why they do it. These individuals help the organisation itself to learn from mistakes as well as success. Marsick and Watkins (1999) point out the learning organisation is a place where people align a common vision and sense, and interpret changing environment, while generating and sharing new knowledge creating innovative products and services to meet the customer’s needs. The core of learning organisation is not just storing of massive knowledge but constant acquiring, transmitting, and utilising knowledge to improve a firm’s capabilities.

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
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<tr>
<td>Kofman and Senge (1993)</td>
<td>Individual as ‘legitimate being’. Organisation needs vision, patience and courage</td>
</tr>
<tr>
<td>Garvin (1993)</td>
<td>Organisational learning traced through three overlapping stages of cognitive, behavioural and performance improvement.</td>
</tr>
<tr>
<td>Marsick and Watkins (1999)</td>
<td>Aligning people around a common vision, sense and interpret their changing environment, generate and share new knowledge</td>
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Table 2.6 Definitions of learning organisations (Source: Various)

As seen Table 2.6, there are several definitions of the learning organisation. Despite of the variety of definitions, there are common points of views towards the learning organisation. Learning organisation fosters the internal transfer of knowledge, and it
focuses on the process of knowledge transfer as a source of competitive advantage rather than content that is stressed within resource-based and knowledge-based view.

2.4.4.4 Social Capital Theory

Academics consider the firm as a member of social community to create and share organisational knowledge (Nonaka and Takeuchi, 1995; Spender, 1996). Nahapiet and Ghoshal (1998) state that all organisational resources are created through the generic process of combination and exchange and this process might be enabled by the social capital. Social capital is defined as “the sum of the actual and potential resources embedded and derived from within the network of relationships possessed by an individual or social unit” (Nahapiet and Ghoshal, 1998). According to this perspective, organisational knowledge as an output of social network is created by the process of exchange and combination (Cohen and Levinthal, 1990).

There are three dimensions of social capital: structural, cognitive, and relational dimension. The structural dimension is made up of the social network connections of the parties involved in the exchange. The structural dimension is seen as being derived indirectly from, and supporting the development of the cognitive and relational dimensions. The cognitive dimensions provide that context and suggest that sharing comes about through two primary mechanisms: using a common language and vocabulary; and through shared narratives in the form of myths, stories and metaphors. The final and the most significant dimension is relational and it provides the basis for access to parties in the exchange as well as the motivation to be related in the exchange.

This concept points to the significance of social interactions in knowledge management as conceived by the literature on the knowledge management and knowledge markets. The main focus of the internal markets perspectives is on groups and individuals within an organisation interacting to create and/or exchange knowledge (Nonaka and Takeuchi, 1995; Hargadon, 1998; Johannessen et al., 1999; Davenport and Prusak, 1998). Nonaka and Takeuchi (1995) have developed a theory to serve the basis for converting individual tacit knowledge to organisational explicit knowledge. They use this social interaction to enable the knowledge processes. Nonaka and Takeuchi’s view of the learning process might be reflected in Western organisations through the processes of external
consultation. They speculate that tacit knowledge is made explicit knowledge via the process of external consultation.

Knowledge exchange includes external as well as internal exchanges. Davenport and Prusak (1998) suggest that internal knowledge markets operate within all organisations but they might not manage well. A knowledge market brings together the buyer and seller of knowledge and operates like other markets where the buyers and sellers negotiate to conclude mutually satisfied price for the exchange of stuffs. According to Prusak and Cohen (1997), there are three entities at work for the payment of knowledge market, namely reciprocity, repute and altruism. The concept of market in the theory of social capital stresses the importance of social interaction as the basis for knowledge management. In other words, the promotion of social interaction and the consequences of exchanges are crucial elements of knowledge management within social capital perspective.

Social capital perspective indicates an important background for knowledge management. Academics have suggested that structure and culture of an organisation where social capital can be accumulated via interactions of individuals can serve as a basic ground for knowledge combination and exchange. This perspective may develop the concept of infrastructure capability of knowledge management, such as constructing technology, structure and culture.

2.4.4.5 Other knowledge management perspectives

Nonaka has held a prominent position in the field of knowledge management since he developed knowledge management issues with the perspective of knowledge creation. Nonaka and Takeuchi (1995) finished their masterpiece of work in ‘The knowledge creating company’, and they suggest that tacit knowledge has a technical dimension, represented by the “know-how”. In addition, the authors propose that knowledge creation is a “spiral processes of interactions between tacit and explicit knowledge”, which is dependent upon the “socialisation” of the individual’s tacit knowledge and the expression (i.e. externalisation) of his or her expertise for others to consider and develop (i.e. combination). This suggested SECI model has been recognised as a fruitful and fundamental approach to explaining the ways knowledge is created, transferred and re-

29
created in an organisation (See Figure 2.4). Variety of academics has believed that Nonaka is one of the leading knowledge management researchers and they have not criticised the fundamental knowledge creation theories by Nonaka.

However, Garvin (1993) criticises that Nonaka’s learning organisation have often been pursuing utopia and his theories are filled with symbolic terminologies. He also argues that many of Nonaka’s recommendations are ‘far too abstract’ and do not provide a framework for action. According to Garvin (1993), Nonaka focuses on highly philosophical aspects and they are difficult to implement to practices.

Nonaka and Konno (1998) introduce the concept of “Ba”, which is a Japanese vocabulary that means a ‘place’ in English literally. However, it is used in the context of cultural environment where social interactions are facilitated (See Figure 2.5). There are four categories of ‘Ba’:

1) Originating Ba: a space where individuals share feelings, emotions, experiences and mental models
2) Interacting Ba: a space where tacit knowledge is made explicit and consisting of two key factors of dialogue and metaphors
3) Cyber Ba: a space of interaction in a virtual world, which implicates the combination of new and existing explicit knowledge to generate new explicit knowledge throughout the organisation
4) Exercising Ba: a space that facilitates the conversion of explicit knowledge into a tacit knowledge

![Figure 2.5 The concept of 'Ba' (Source: Nonaka and Konno, 1998)](image)

In addition, Nonaka et al. (2000) propose the five enablers to move beyond the limitations of knowledge creation theory:

1) Instil a knowledge vision
2) Manage conversation
3) Mobilise knowledge activists
4) Create the right context
5) Globalise local knowledge

The authors’ intention to suggest this model is to propose a practical guide to the organisation in real world. However, this model still focuses on the disciplinary guide rather than a specific organisational behaviour to secure effective knowledge management strategies. According to Nonaka et al. (2000), they talk about the manager’s role, such as shortening the time between knowledge created and knowledge received, documenting created knowledge, and ensuring the recirculation of created knowledge. The most significant role for the manager is assistance and supporting to create tacit knowledge and sharing the knowledge in corporate level rather administrating the documentation of created knowledge (Nonaka et al., 2000).
Snowden (2002) is notable for the action-perspective that raises the necessity to develop a post-Nonaka knowledge management theory, as the SECI model is only applicable to the Japanese hierarchical type of large firms, thus it is difficult to generalise and implement on a global level. He notes that a post-Nonaka knowledge management theory should be deployed on the basis of a more autonomous nature of organisational structure with supportive leadership style. He also asserts that ‘context management’ in digital community plays an important role to facilitate horizontal exchange of knowledge in the cyber space, paying attention to what he calls ‘persona’. In this point, Snowden’s assertion includes that Nonaka’s model is too dependent upon face-to-face communication, and this is one of the reasons that he insists that there should be a post-Nonaka knowledge management theory to accompany with the issue of on-line communication and knowledge community that are facilitated by the emergence and development of the Internet all over the world.

Based on this concept, Snowden elaborates the theory of “Knowledge Management Ecology”, in which he concentrates on the balanced and implanted management of explicit and tacit knowledge. According to Snowden (1998), he defines knowledge as “the value of knowledge comes from its exercise, not from its existence per se”. In addition, his approaches toward knowledge in organisational contexts are decision-making perspective, which deals with the level of certainty pertaining to means, ends, and casual relations. Snowden (1998) argues that organisations will manage four types of transitional activities in a decision matrix:

1) Sharing explicit knowledge through systems and structures
2) Sharing tacit knowledge through psychosocial mechanism
3) Transforming tacit to explicit knowledge through business process reengineering (BPR), documentation and related
4) Releasing tacit knowledge through trust and its dynamics

In addition, some authors contend that Nonaka’s definition of tacit knowledge is somewhat distorted from the original definition provided by Polanyi (Ambrosini and Bowman, 2001; Whitley, 2000). Firestone (2001) argues that Polanyi’s concept of implied knowledge is something different from Nonaka’s tacit knowledge. On the other hand, some researchers have continued to respect the broad sociological issues in
knowledge creation and have presented ideals for organisational cultures (Leonard-Barton, 1995; von Krough, 1998; Brown and Duguid, 1998). Leonard-Barton (1995) suggests direction settings, ideation tools, and emergent understanding for managers that seek knowledge-creating cultures. von Krogh (1998) states that the forms of behaviours, or care that contribute to the relationships, which underpin the exchange of knowledge, and emphasise altruistic phrases ranging from trust to courage. It may be arguable that these notions are revolutionary approaches to the knowledge creation. In summary, the main point of post-Nonaka’s theory of knowledge creation stresses the manager’s role to encourage knowledge creation and the corporate culture.

Hedlund (1994) proposes that the N-form corporation and suggests that a principal attribute of the model is its conjoint analysis of two sets of concepts: tacit/explicit knowledge, and four levels of social aggregation. He describes a set of dynamics related to knowledge creation, development, transfer, and use, yielding a structure that is built around three basic dimensions. According to him, he lays the foundation for his dynamic model by distinguishing among types, forms and levels of knowledge. In brief, he attempts to compare with tacit and articulated knowledge with different level of social accumulation.

Earl (1999) proposes a set of heuristics that situated the Chief Knowledge Officer (CKO)/knowledge function within organisations and prescribes its activities. He distinguishes data, information and knowledge that others already have described. He proposes a classification and depicts that “trite and imperfect as this classification is, it suggests that knowledge comprises expertise, experience, know-how, skills and competence…” Furthermore he recognises two organisational states that are relevant to knowledge management: knowledge and knowing. Earl (1999) proposes that an organisation may useful concern itself with the creation, protection and leveraging of its knowledge assets by attending to four functions:

1) Inventorying: mapping individual and organisational knowledge
2) Auditing: assessing the nature and extent of planned ignorance and then developing knowledge through learning activities
3) Socialising: creating events which enable people to share tacit knowledge
4) Experiencing: addressing the problem of unknown ignorance by learning from experience, action and handling unusual situations

2.4.5 Influencing factors of knowledge management

There have been many researches to find out enablers and barriers to enhance knowledge management as well as to prevent from making repetitive mistakes (Ajmal et al., 2010; Chua and Lam, 2005; Lilleoere and Hansen, 1999; Davenport et al, 1998; Lin, 2007a; Nonaka et al., 2000). However, it may be difficult to draw a line between successful factors (i.e. enablers, or enabling factors), and failure factors (i.e. barriers, interfering factors) of knowledge management (Ajmal et al., 2010; Storey and Barnett, 2000). The reasons for difficulties in distinction between enablers and barriers may be that while one of factors will play a role as an enabler, it will also influence damaging factors to implement knowledge management.

Ajmal et al. (2010) suggest describing these factors-enablers and barriers-as “The influencing factors” or “The affecting factors” reflecting these ironic and contradictory characteristics and Table 2.7 shows various academics suggestion of the influencing factors. For example, a firm will invest in a significant amount of capital to establish a knowledge repository and restructure the network to support and stimuli knowledge management activities. In this case setting up a knowledge repository and maintaining the network may be the main factors to encourage knowledge management. If the overall systems settle down throughout the company and members are utilising them, we can then judge that this knowledge management project is successful case and the main enablers of this case are the repository and the network. On the other hand, members of the firm will not utilise a recently equipped network system and the amount of knowledge in the repository is lower frequency and amount than expected value, management will conclude that the knowledge management project is failed (Rezgui, 2001). In this stance, the successful factors of the former case will be the main failure factors to the latter situation. Hence, enablers and barriers of knowledge management could be the same but the elements have duality.
The influencing factors indicate a variety of elements and it can be divided into the three major influential components. The major influencing factors are management, information and communication technology and organisational culture. First of all, many academics stress the importance of information and communication technology for success and failure of knowledge management. They express that information and communication technology in different ways (e.g. technical infrastructure, technology) likely to culture but the main consensus point is emphasising the potential significance of utilising it for knowledge management (Davenport et al., 1998; Ajmal et al., 2010; Hanisch et al., 2009; Chua and Lam, 2005; Braganza and Möllenkramer, 2002). Information and communication technology is the essence of codification strategy for managing knowledge (Hansen et al., 1999) and the success of knowledge management is
dependent upon how to establish and use it with proper timing and positions (Davenport et al., 1998). Knowledge is residing in the human brain and it would be worthless when knowledge exists in peoples’ head. However, the knowledge will be the core of knowledge management and the source of competitive advantage if it will turn into explicit and tangible ways as well as many employees use them. Information and communication technology is the core of managing knowledge when knowledge turns into explicit and tangible forms because information and communication technology can store vast amount of knowledge in the repositories and can enhance the accessibility and connectivity removing timing and locational barriers. Furthermore, it would be easier to plant knowledge management in all over the organisation, if the firm has already constructed sufficient technical infrastructure (Davenport et al., 1998). However, one of the misconceptions of information and communication technology is a panacea, which will resolve all the problems arising from knowledge management. Chua and Lam (2005) point out technology is not becoming the objectives of knowledge management but merely tools and supporting elements. In addition it could yield serious and unexpected problems such as over budget of installing and maintaining the technical infrastructure, and over-reliance of utilising the technology (Chua and Lam, 2005). It is certain that information and communication technology is one of the essential influencing factors for knowledge management but it is needed to consider the firms’ status quo. Hence, well-organised and well-prepared technological infrastructures will be the significant factors for success or failure of knowledge management.

Secondly, management commitment and support will be the fundamental influencing factors for the success of knowledge management. If executives are stick to utilise conventional practices and dread to commence knowledge management, it might be more difficult to implement knowledge management initiatives and projects compared with strongly supported organisations. Davenport et al. (1998) indicate management’s commitment to knowledge management has to be prior position compared with other influencing factors (e.g. technology, incentives, motivations, culture, and so on). Because the overall trend of corporate strategies and cultures are dependent upon the management style and knowledge management is not bottom-up voluntary actions but crucial transform-oriented movements from top management (Davenport et al., 1998). Thus the supports from the executives are the most crucial and fundamental influencing elements for knowledge management (Hanisch et al. 2009). In addition even though knowledge
management activities are progressing among employees in an organisation, it might be less proactive, fertile and small-scale movements unless top management and executives are assertive to carry on it (Davenport et al. 1998).

The last influential factor is an organisational common culture. Significant numbers of academics have been corresponded that culture is the most significant elements to knowledge management (Davenport et al., 1998; Ajmal et al., 2010; Hanisch et al., 2009; Alavi and Leidner, 1999; Adenfelt and Langerström, 2006). Moreover, it is the most difficult element to cultivate it when it has not existed in an organisation (Davenport et al, 1998). Culture might be depicted with different terms and expressions but they are consensus with the fundamental concept. Braganza and Möllenkramer (2002) express the organisational culture is members’ willingness to accept and active behaviours to take part in knowledge management initiatives. Employees in typical organisations might be reluctant to share and transfer knowledge to others. They may consider the specific knowledge (i.e. know-how, and know-what), will be competitive edges compared to others and these will become a kind of survival strategies in the era of unlimited competition.

In addition to the recent unstable and insecure employment situations have become an additional exacerbating factor to share knowledge in an organisation. Despite of these circumstances, one of the reasons for implementing knowledge management is achieving sustainable competitive advantage (Adams and Lamont, 2003; Argote and Ingram, 2000a; Argote and Ingram, 2000b; Davis and Botkin, 1994). Knowledge is difficult to imitate from outside of the firm even though inside of the company. Because knowledge is intangible and generated from human brains so it is arduous to replicate or imitate unless shared among the knowers and the finders. In addition, continuously creating and sharing the created knowledge within the organisational members would be a significant element to obtain sustainable competitive advantage (Lubit, 2001; Nonaka and Takeuchi, 1995; Argote and Ingram, 2000b). In order to construct and enhance knowledge-sharing or knowledge-friendly culture, it is required to build the trustful atmosphere among members (Chua and Lam, 2005).

When the trustful culture is cultivated in a company, members will accept to open their knowledge and willing to share and transfer them to others. Openness and willingness
will encompass to answer any questions and to admit the value of others’ knowledge (Chua and Lam, 2005; Lilleoere and Hansen, 2011). People may consider others’ knowledge is naive and irrelevant to their knowledge and work. However, they will respect each other and acknowledge the value of their knowledge when the tendency of openness and willingness will be prevalent in the organisation (Chua and Lam, 2005). Moreover, it will be needed to discern what the knowledge is significant and priority to get rid of such misconceptions among employees (Adenfelt and Langerström, 2006). Additionally, Hanisch et al. (2009) state information and communication technology might be insufficient and crippled unless the encouraging culture to utilise the new software and gadgets. In summary culture is not only one of the influencing factors toward knowledge management but also a fundamental affecting element regarding other knowledge management influencing factors. Hence it could be mentioned that the most significant affecting factor is culture.

Even though a firm has established a superior system and infrastructure to utilise knowledge management, it will fail to implement it unless employees take part in such activities spontaneously. The fastest and most effective ways to motivate people to take part in the knowledge management might be incentives and rewards system, which are financial or non-financial components (Davenport et al., 1998; Ajmal et al., 2010). According to Ajmal et al. (2010), attractive incentive packages will lead employees to motivate and to encourage harnessing and generating useful knowledge. Hence, appropriate incentive will lead to motivate people to apply to and participate in knowledge management.

Hanisch et al. (2009) state two distinctive influencing factors towards knowledge management in project environments. Firstly, building trust amongst members in a project team is a significant element. A project team is a temporary synthesis of different divisions and organisations coming from inside and outside of a firm and the members will have innate differences arising from the temporary nature. Employees might be reluctant to conceal and share the knowledge and this will be a crucial barrier to successful knowledge management in project management environments. Secondly the communication across all levels of hierarchy is important. Project teams are governed by two different levels, which are functional management and project management hierarchy. Communication within and across the organisations will remove the barriers
to build a trustful atmosphere in members. Moreover, communication among members is the fundamental prerequisite for knowledge sharing and a trustful culture.

2.4.6 Critiques towards knowledge management

In this chapter of the thesis, the author identified positive aspects of knowledge management. While majority of academics have claimed the rosy future of knowledge management from various research fields such as strategic management, business and management, and organisational behaviour studies, there are a group of researchers who criticise the potential usability and its academic position.

The critiques of knowledge management are similar to the influencing factors in many points. Gupta et al. (2000) lay out four major challenges in knowledge management.

1) Organisational culture shift
2) Sharing employees’ knowledge
3) Needs for creating a process to convert tacit knowledge to explicit knowledge
4) Forging linkages among unstructured knowledge.

These difficulties are consent with the major influencing factors mentioned in the previous part. The reason why the challenges and the affecting factors of knowledge management are overlapping is that the successful factors may be the most difficult tasks to carry on as well as the failure factors will be the most arduous fulfilment to remove. Sharp (2003) indicates three pitfalls to implementing knowledge management. He asserts companies have to overcome these challenges to succeed in knowledge management initiatives or project. Firstly, the return on investment of knowledge management is relatively less than other management practices, such as reengineering, six-sigma, enterprise resource planning and so forth. In addition the investments in knowledge management have often exceeded the original budget so many executives are hesitating to implement it. Secondly, there might be countless unused or undiscovered knowledge to gain competitive edge and innovation in an organisation prior to adopting knowledge management. However, firms are not willing to discover these valuable assets even though they have not recognised the existence of them. Lastly, knowledge is intangible and difficult to calculate in numbers or other physical methods. The facing challenge is
that it will be needed to assess the true worth of knowledge and to establish appropriate systems to measure the value of it.

Furthermore, there are growing debates on knowledge management, which claim that knowledge management would not become a permanent institutionalised study in business and management such as Total Quality Management (TQM), Quality Circle and Business Processes Reengineering (BPR). Normally, we call research fads or fashions in business and management those of studies have many spotlights from various academics within the first five years and then the attentions towards them will be diminished rapidly during a couple of years (Ponzi and Koenig, 2002). Unlike these studies in business and management, many researchers have recognised the significance of knowledge and it has been a popular subject in philosophy since the ancient Greek era. Despite of long historical backgrounds of knowledge and people’s unconscious recognition of its significance, approximately only two decades have passed since many researchers and practitioners paid attention to knowledge management and it emerged in the business and management study (Hislop, 2010).

Despite of such negative perspectives regarding knowledge management and its relevant studies, the important role of knowledge and knowledge management have been growing, since recent economic situation had been shifted from the traditional manufacturing industry to the knowledge-intensive industry such as consulting and service firms. In addition, Ponzi and Koenig (2002) state that the number of published journal articles have been constantly growing since its beginning into a research domain. In order for knowledge management to become and defend its academic position as a fixture of research, Hislop (2010) insists that academics and practitioners should explore weak points in terms of knowledge management such as knowledge-intensive firms’ indifferences, pursuing the new approaches for implementing practical level and so forth. In addition, Davenport and Prusak (1998) state that in order to succeed in knowledge management, the users of knowledge management should be more patient to potential outcomes of knowledge management.
2.5 Knowledge management in project management

2.5.1 Project management

In the recent years, project management has become more popular than traditional management since it focuses on continuous operations, a single life-cycle phase, minimal active coordination of interrelated hierarchical organisations, and repetitive organisational tasks (Ruuska and Vartiainen, 2005; Wiewiora et al., 2013; Maurer, 2010; Bresnen et al., 2003; Leseure and Brookes, 2004). Unlike conventional management, project management pursues the timely delivery and development of new products and services, multiple life cycle phases, special coordination of interrelated personnel and stakeholders, flexible relationship with all participants of the project, and unique outcomes by various members. Due to these characteristics of project management, variety of companies from various areas such as architecture, engineering and construction industry, pharmaceutical business, defence contracts, and high-technology research and development centres have adopted project management for delivering their new products and services. Accordingly, project management has become one of the most appropriate management disciplines that satisfies the recent complex and fast-changing economic situation. Moreover, lots of researchers in project management research domains consider systematic management of knowledge in project execution beneficial in improving its performance and enhancing efficiency of project delivery. In this section, the correlation between project management and knowledge management is dealt with.

2.5.1.1 Reasons for utilising project management

Project management has become one of the newest and latest management methods in recent years and about 30 per cent of the global economy is run by project-based (Turner, 2009). What factors have brought about such popularity of project management in such a large number of companies? Most of project management practitioners claim that since majority of companies pursue to develop high technology, capital-intensive, and customer-centric business with more efficient and effective manner, agile and flexible form of organisation, project-based organisations, would be ideal to meet such business environments (Boh, 2007). So, how the academics of project management view its reasons for emergence? There are lots of reasons to adopt project management
summarised as shown on Table 2.8. Disterer (2002), for example, contends that the need to implement project management is owing to the external pressure and uncertainty, as well as demands of reduced time to the market. Similarly, project-based organisations could be an appropriate mechanism of managing firms to respond quickly and flexibly against the internal needs, and the external changes (Boh, 2007). Whilst there are lots of reasons for gaining more popularity for adopting project management in various industries, the main reasons of the emergence of project management could be categorised into two streams; external and internal factors.

<table>
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<tr>
<th>Author</th>
<th>Reasons</th>
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<tbody>
<tr>
<td>Almeida et al. (2014)</td>
<td>• Strong competition</td>
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<td></td>
<td>• Shrunken product lifecycles</td>
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<tr>
<td>Disterer (2002)</td>
<td>• Complexity of works</td>
</tr>
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<td></td>
<td>• Environmental pressure and uncertainty</td>
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<td></td>
<td>• Pursuing efficiency</td>
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<td>Gray and Larson (2008)</td>
<td>• Compression of the product life cycle</td>
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<td></td>
<td>• Global competition</td>
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<td></td>
<td>• Knowledge explosion</td>
</tr>
<tr>
<td></td>
<td>• Corporate downsizing</td>
</tr>
<tr>
<td></td>
<td>• Increased customer focus</td>
</tr>
<tr>
<td></td>
<td>• Small projects represent big problems</td>
</tr>
<tr>
<td>Boh (2007)</td>
<td>• Flexible respond to changing organisational needs</td>
</tr>
<tr>
<td></td>
<td>• Respond to the organisation’s facing changes</td>
</tr>
<tr>
<td>van Donk and Riezebos (2005)</td>
<td>• Changing projects nature: being larger and complex</td>
</tr>
<tr>
<td></td>
<td>• Being shortened work expectancy and needing experienced</td>
</tr>
<tr>
<td></td>
<td>persons</td>
</tr>
<tr>
<td></td>
<td>• New products and markets</td>
</tr>
<tr>
<td>Association for Project</td>
<td>• Providing a greater likelihood of achieving the desired</td>
</tr>
<tr>
<td>Management (2012)</td>
<td>• Ensure efficient and best value use of resources</td>
</tr>
<tr>
<td></td>
<td>• Satisfy the differing needs of the project’s stakeholders</td>
</tr>
</tbody>
</table>

Table 2.8 Various reasons for adopting project management

External factors are that project management is a kind of organisational optimisation with response to the external requirements such as changed economic environments. This point of view regarding project management views the emergence of project management as slightly passive rather than an active movement of managing firms. In other words, companies had adopted a form of project management as one of the
strategies for the survival of the fittest. Externally, there is growing harsh competition in domestic and international markets as well as the time-to-market of products and services that is getting shorter than in the past. In addition, plenty of companies are pursuing more customer satisfaction or customer-centric strategies to survive in the harsh competitive market. Unlike the past market situation, globalisation is not only a prevailed trend, but also an inevitable condition to sustain in the recent years. As a result of survival strategy dealing with the external changes and demands, a growing number of firms have embraced project management or project-based management as a useful management tool.

Unlike the external factor of its origin, internal reasons of adopting project management was a type of experimental approach to change the firm to an optimal condition within the inner circle rather than the external forces. This inducement of project management is more active and spontaneous participation and adaptation of it as a means of internal optimisation and improvement process. In other words, lots of firms are internally pursuing more efficient resource allocation and requiring more appropriate personnel for better performance. This pursuit of enhancement of efficiency has ignited that more and more organisations had adopted project management. In addition, since project management is more flexible than typical corporate management or functional management, lots of companies would be able to deploy firm’s resources variably and changeably in order for minimal loss.

Hence, such internal and external factors have let a variety of organisations adopt and utilise project management as a significant and influential means as well as making the firms become more agile, robust, and versatile to react uncertainties in the recent economic situation. Moreover, project management will be one of the best organisational management forms to react to the recently changed economic situations with minimal adjustment of the on-going business strategies and a company’s structure.

2.5.1.2 The basics of a project: a definition and its characteristics
Although there are a variety of definitions in terms of knowledge and knowledge management from academics to practitioners, the definition of a project is relatively uniformed compared to the previous topics. Most project management academics and
practitioners have also considered a project, as an important management medium for a flexible response to the changing environment as well as new general management in the globalised economy.

The most prominent definition of a project may be from the Project Management Institute’s one. According to the project management body of knowledge (PMBok) by the Project Management Institute (PMI), the definition of a project is “a temporary endeavour undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end.” (PMI, 2009). Turner (2009) has a similar point of view and defines that a project is a temporary organisation to achieve beneficial changes with utilising resources (see Figure 2.6). Accompanying with this definition of a project, more definitions of a project by various researchers depicted as shown on Table 2.9. As seen in the table, the concept of a project has close and similar points of views towards the definition of a project both on theoretic as well as on practical side (e.g. PMI and APM) (See Table 2.9).

![Figure 2.6 Definition of a project (Source: Turner, 2009)](image-url)
Based on these various definitions, a project is provisional, goal-oriented, pursuit of visible outcomes and managed in constrained budget and time. Along with these essentials, a project could be achieved by a group of experts and specialists with optimal utilisation of allocated resources.

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disterer (2002)</td>
<td>Temporary organisations with specific objectives, detailed tasks, and restricted time and budget</td>
</tr>
<tr>
<td>PMI (2008)</td>
<td>A temporary endeavour undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end</td>
</tr>
<tr>
<td>Gray and Larson (2008)</td>
<td>A complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs</td>
</tr>
<tr>
<td>Almeida et al. (2014)</td>
<td>A temporary endeavour incorporating the work of heterogeneous professionals undertaken to create a unique product, service or result</td>
</tr>
<tr>
<td>Ajmal et al. (2010)</td>
<td>Involvement of a group of people working together with shared responsibilities and resources to achieve a collective mission</td>
</tr>
<tr>
<td>Turner (2009)</td>
<td>A Temporary organisation to which resources are assigned to do work to deliver beneficial change</td>
</tr>
</tbody>
</table>

Table 2.9 The definition of a project

In attempting to deal with defining a project, it is important to distinguish general characteristics of a project. Linder and Wald (2010) summarise the four major characteristics of projects: the uniqueness and temporariness; discontinuous working and teams; lack of natural mechanism of learning; and short-term orientation. Similarly, Hanisch et al. (2009) articulate that temporary forms of co-operation and working constellation are the distinctive nature of working in projects environments. In addition, as the explanation of Kerzner (2009), “the ideal project manager would probably have doctorates in engineering, business and psychology, and experience with 10 different companies”. A project has a characteristic which it would run as one single independent organisation but it would require variety of experts and specialists for completing the
certain goals and objectives. There are various suggestions of the characteristics of a project described as shown on Table 2.10. Based on this variety of nature of a project, the general characteristics of a project can be outlined as:

1) Transient
2) Time-specific
3) Interdisciplinary and multiple members
4) Utilisation of scarce resource
5) Uniqueness

<table>
<thead>
<tr>
<th>Authors</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linder and Wald (2010)</td>
<td>• Uniqueness and temporariness</td>
</tr>
<tr>
<td></td>
<td>• Discontinuous working and teams</td>
</tr>
<tr>
<td></td>
<td>• Lack of natural mechanism of learning</td>
</tr>
<tr>
<td></td>
<td>• Short-term orientation</td>
</tr>
<tr>
<td>Harish et al. (2009)</td>
<td>• Temporary</td>
</tr>
<tr>
<td></td>
<td>• Cooperation</td>
</tr>
<tr>
<td>Gray and Larson (2008)</td>
<td>• An established objective</td>
</tr>
<tr>
<td></td>
<td>• A defined life span with a beginning and an end</td>
</tr>
<tr>
<td></td>
<td>• The involvement of several departments and professionals</td>
</tr>
<tr>
<td></td>
<td>• Doing something that has never been done before</td>
</tr>
<tr>
<td></td>
<td>• Specific time, cost, and performance requirements</td>
</tr>
<tr>
<td>PMI (2008)</td>
<td>• A definite beginning and end</td>
</tr>
<tr>
<td></td>
<td>• Creating a lasting outcome</td>
</tr>
<tr>
<td></td>
<td>• Social, economic, and environmental impacts</td>
</tr>
<tr>
<td>APM (2012)</td>
<td>• Unique</td>
</tr>
<tr>
<td></td>
<td>• Transient endeavour</td>
</tr>
<tr>
<td></td>
<td>• Achievement of planned objectives</td>
</tr>
<tr>
<td></td>
<td>• Defined outputs, outcomes, or benefits</td>
</tr>
<tr>
<td></td>
<td>• Acceptance criteria with agreed time scale and budget</td>
</tr>
<tr>
<td>Turner (2009)</td>
<td>• Goal: unitary, beneficial, change</td>
</tr>
<tr>
<td></td>
<td>• Features: unique, novel, transient</td>
</tr>
<tr>
<td></td>
<td>• Pressure: uncertainty, integration, urgency</td>
</tr>
<tr>
<td></td>
<td>• The plan: flexible, goal oriented, staged</td>
</tr>
</tbody>
</table>

Table 2.10 The characteristics of a project
Firstly, the most distinguished nature of a project compared to conventional organisations is its temporality and a transitory life cycle. A project team would be composed to fulfil certain goals and in order to achieve these aims the project team would establish several objectives. Such transient and ephemeral nature is quite different from department, divisions, or teams in most conventional organisations (e.g. Marketing, sales, auditing, procurement etc.). Secondly, a project has a certain time restriction from beginning to end completing a goal, which is arisen by the temporal nature. Since a project has specified objectives with allocated personnel and resources, it should be completed within the time limit. Recently, a growing number of organisations adopt project management because it could achieve a certain goal such as the development of new products and services within a short period of time. Thirdly, unlike traditional functional divisions or departments, a project team is composed of interdisciplinary members from different specialties and backgrounds. While traditional functional management would operate lots of different divisions and departments based on a group of people with same or similar skills or specialties, a project is a constellation of experts from different backgrounds and fortes for achieving the project goals and objectives under the guidance of a project manager. Fourthly, a project team would utilise allocated and limited resources during the project execution. Since a project is a temporary running organisation, it would be impossible to supply a project team with unlimited resources from the mother organisation. As a result, the success of a project would depend upon how the project team distribute and make use of the allocated resources. The last characteristic is that a project would carry out unique missions, which have not been performed before. Although there may be lots of methods to perform such tasks, one of the prevalent ways to carry out such works is run by projects. As this reason, lots of weapon development projects during the Second World War, NASA’s space development programmes, and recent IT deliverables were conducted by project-based.

2.5.1.3 The definition of project management

As a project has generic attributes, it would be required to possess competency and expertise to manage and control the project where the place different specialists and personnel from various backgrounds. In a simple sentence, project management is a systematic way to actualise clients’ unprecedented events or products. Turner (2009) defines project management as “project management is about converting vision into
reality. We have a vision of some future state we would like to achieve”. As a result of this situation, one needs to obtain particular capability to manage our visions or dreams (i.e. a project) for its achievement (i.e. successful production of products or services, and timely delivery). Project Management Institute (PMI) (2008) defines project management as “the application of knowledge, skills, tools, and technique to project activities to meet project requirement and project management”. Similarly, Association for Project Management (APM) defines project management as “the application of processes, methods, knowledge, skills, and experience to achieve the project objective”. In addition, Kerzner (2009) suggests that project management is a completion of task with on time, on budget, and high level of performance accompanying with the client’s satisfaction. In a similar vein, Gray and Larson (2008) indicate that project management would not only pursue a result-oriented management but also aim to build more collaborative relationships amongst variety of project’s participants. Accordingly, there are no dissenting opinions in terms of project management, which is a systematic application for completing the objectives which reflect the customer’s value and requirements within the limited budget and the restricted time scale (See Figure 2.7).

![Figure 2.7 The core components of project management (Source: APM, 2009)](image)

2.5.2 Knowledge management in project management context

It is common to indicate the significance of managing project knowledge in both practitioners and academics, as discussed in the previous sections. Both Project Management Institute (PMI) and Association of Project Management (APM) have stressed the significance of ‘lessons learned' from past projects, and the project closure procedure for reviewing and reflecting ongoing projects. According to the Project
Management Body of Knowledge (PMBoK) by PMI (2009), although there is no specified terminology of ‘knowledge management’ and knowledge, it stresses that one of the significant steps in the project management life cycle is project closure as a means of gathering, and disseminating valuable project information and knowledge. In addition, APM Body of Knowledge (2006) also refers to the importance of knowledge creation and dissemination in a project. It demonstrates that knowledge is created by individual and organisational learning through socialisation, articulation of what each individual knows, embodied into individual skills and works, and expression of what each member’s knowledge during projects. In this section of the chapter, knowledge management studies in project management context have been dealt with from various relevant researches.

As shown in the previous section, project management is an inevitable trend of management with a responsive fast changing market situation, customers’ needs, globalisation, and competitions (Defillippi and Arthur, 1998; Morris, 1997; Gann and Salter, 2000; Wiewiora et al., 2013). Recently, a growing number of interest has paid attention to systematically and efficiently management of project knowledge for prevention of reinventing the wheel, organisational learning, avoidance of organisational memory loss or amnesia, and improving the firm’s performance (Boh, 2007; Disterer, 2002) Wiewiora et al. (2013), for instance, maintain that since the multifaceted characteristics of knowledge in project management context, it is important for project-based organisations to systematically manage project knowledge. Whist the fundamental concepts of knowledge management in project-based firms have been consensus with other business and management researches, researchers have also stressed that knowledge management studies in project environment has to take into consideration its unique and different characteristics (Schindler and Eppler, 2003; Hanisch et al., 2009; Wiewiora et al., 2010). In other words, a project team is a temporary composition of various members from internal functional divisions and external staffs from stakeholders to fulfil the project’s goal within a budget and on time (Hanisch et al., 2009). The characteristic of temporality will bring about the project knowledge management problems and difficulties, that is, the loss or fragmentation of project knowledge. These matters may stem from the frequent turnovers of members and reassignment of staffs to each project. Even though the project knowledge will be collected after finishing the work through project learning, it cannot avoid knowledge amnesia or leakage due to the
time lapse (Schindler and Eppler, 2003). Additionally, the sources of knowledge within project-based organisations are various during different stage of a project, different personnel and so on as well as there are lots of different types of knowledge would be required during different phases of project execution and closing stage (Wiewiora et al., 2010). Accordingly, knowledge management in the project management context is not only preventing leakage of organisational valuable intellectual assets, but also managing the variety of sources and types of knowledge properly.

Moreover, it is widely accepted that due to the temporary nature of a project, systematically managing project knowledge is getting more significant from variety of academics in project management (Linder and Wald, 2010; Love et al., 2005; Ly et al., 2005; Thiry and Deguine, 2007). Besides, effective and timely implementation of knowledge management will make project-based organisations more competitive and robust to adjust and react towards internal and external challenges and leakages of valuable intellectual assets (Wiig, 1997a; Wiig, 1997b; Liebowits and Megbolugbe, 2003; Tan et al., 2006). Externally, recent project management has changed to respond to the today’s dynamic and changing environment: the scale of projects tends to become larger and more complex than previous; employees are working in an organisation shorter and companies are pursuing for qualified people from external; and new knowledge and information have to be disseminated into the company to share the new insights and knowledge (van Donk and Riezebos, 2005). In a nutshell, managing project knowledge is not a selective option for a firm, but it is an indispensible element to improve a firm’s performance, and to prevent leakages of valuable intellectual assets and reinvention of the wheel.

The knowledge management studies in project-based organisations can be divided into two major researches. One stream of research on knowledge management within project environment is stressing the significance of knowledge management itself to achieve improved performances and competitive advantage reflecting the recent economic environment. This sort of researches indicate the significance of knowledge management and its potential role as well as the success factors of knowledge management in project-based organisations rather than suggesting detailed methods or ways for improved knowledge management capabilities. Studies in this category have also explained how knowledge should be retained and managed as well as what project-based organisations
would obtain potential benefits from knowledge management (Carrillo, 2004; Carrillo et al., 2004; Carrillo and Chinowsky, 2006). For example, Ajmal et al. (2010) stress that knowledge management in project management context is inevitable in order to increase the project’s efficiency as well as to establish sustainable competitive advantage. In their research, they propose the potential influencing factors for successful knowledge management in project-based organisations: an attractive incentive system; coordination amongst departments and employees; and an organisational culture, which encourages participation of knowledge management. Similarly, Lindner and Wald (2010) show how to successfully implement knowledge management in a temporary organisation such as project teams. In this research, they highlight that information and communication technology, and an organisational culture would be crucial factors for success of knowledge management in project-based context. Likewise, lots of academics have researched what the success factors of knowledge management are, and how it would be implemented for its success. Moreover, this type of inquiries is closely related to utilisation of information and communication technology, management of human resource, cultivation of organisational culture, behaviours and leadership (van Donk and Riezebos, 2005). In addition, academics have been exerting to develop methods or techniques to convert tacit knowledge to a more accessible and tangible explicit or codified knowledge. Then, the knowledge will be stored in a knowledge inventory or reservoir so that it would be possible for organisational members to access and utilise the knowledge in the future. This type of the research is closely related to the development of information and expert systems that are pursing to facilitate knowledge management and to develop knowledge management systems based on information and communication technology. Moreover, under this boundary of knowledge management in project management context, variety of researchers has debated the potential role of information and communication technology, and culture (Hanisch et al., 2009). Such researches deal with a macro level of knowledge management in project management context and it would be a general guideline for shedding light on its existence and arousing its importance.

The other research stream of knowledge management in project management context has dealt with the characteristics of underlying stages in knowledge management, which are creating, acquiring, transferring, sharing, and disseminating (Huang and Newell, 2003; Tan et al., 2006; King, 2008). The academics’ enquiries of this category has analysed
knowledge management cycle models that describe the key elements of knowledge management during the project management phases or cycles (King, 2008). These researches are not only dealing with developing detailed methods for building a knowledge inventory, disseminating knowledge inter and intra project organisations, but also exploring measurement tools of knowledge management initiatives and activities. Boh (2007), for example, elucidates four types of knowledge sharing mechanisms in project-based organisations: personalisation and codification; and institutionalisation and individualisation. Moreover, lots of academics in this category have focused on “lessons learned” and “post-project reviews” as an important means to transfer and disseminate project knowledge to other projects (Disterer, 2002; Anbari et al., 2008, Ajmal et al., 2010). Disterer (2002), for instance, shows his interest towards project closing step which would be very important for knowledge recirculation and accumulation. In addition, Anbari et al. (2008) also emphasise the significance of post-project reviews as a medium to enhance the organisation’s competence as well as exploring the reasons why current post-project reviews are not used even though lots of researchers and practitioners have underlined its significance and usability.

In a similar vein, Newell et al. (2006) studied limited usage and potential problems regarding ICT-led project review practices. In this study, they pointed out the status of recent projects that focus on products or deliverables rather than processes. In addition, they also stress the need of intermediaries for balancing between individual knowledge and organisational knowledge in ICT-led projects. According to them, the development of a personal network for enhanced knowledge sharing and transfer between and within projects are the key problems of currently using post-project review practices as a means of management of project’s knowledge. Along with the researches stressing the important role of post-mortem activities, some of the researchers have suggested practices to enhance capturing the project knowledge and stressed that capturing the project knowledge without losses or fragmentations is one of crucial matters in knowledge management within project-based organisations to resolve the knowledge leakage problems. Kamara et al. (2002) assert that the main cause of knowledge losses and fragmentation is the time lapse so the resolution of this situation might be capturing and storing the knowledge in real time. Schindler and Eppler (2003) propose that debriefing subsequent to milestones would be beneficial to project knowledge repository compared to existing techniques such as post project research and knowledge evaluation.
Tan et al. (2006) is consensus with the importance of knowledge acquisition with minimising the leakage and they suggest the ‘Live capture’ methods of project knowledge to avoid knowledge outflows. Teerajetgul et al. (2009) suggest the web-based information and communication technologies would facilitate capturing the project knowledge in real-time and on site. Researchers in this context of knowledge management studies, not only concentrate on micro level problems of knowledge management phases (e.g. creation, storage, dissemination, sharing, transferring), but also develop more detailed approaches rather than general guidelines and principles.

2.6 Summary

While a growing number of organisations embrace knowledge management as a key strategic initiative to enhance a firm’s competitiveness, a variety of theories and perspectives have followed from theorists and practitioners. In the recent years, with the development of information and communication technologies, vast amount of knowledge management researches have focused on technological deployment, apart from the theoretical and disciplinary perspectives. Meanwhile, another group of researchers have widened knowledge management approaches as aligning with other studies such as knowledge engineering, social psychology, or project management. With such increased interests on knowledge management, it may be true that the scope of knowledge management is getting larger and deeper than before.

Obviously, previous reviews of literature contributed to the understanding and establishing of knowledge management in general, and other disciplines (e.g. business and management, strategic management, and information systems researches) as well as considering its position in the project management context. Through reviewing the literature, it was found that the existing approaches and studies of knowledge management in project management domain are relatively rare and scarce. In other words, even though there is a growing awareness of the significance of knowledge and knowledge management in other research areas, relatively small number of researchers has paid attention to its potential role and significance for prevention of reinvent the wheel, performance improvement, and achievement of competitive advantage. However, it is clear from the theoretical exploration of knowledge management in project management context that knowledge management has a significant role in this domain.
Knowledge management is a method to improve the project’s performance as well as to prevent from the loss of the intellectual assets during the projects.

In addition, the literature shows that in recent days, growing number of researches also takes into account that sharing and transferring the stored or created knowledge with members in project teams will be much more important than preserving the piled one. Under this research perspective, academics explore potential influencing factors to enhance sharing and transferring capability both hard and soft factors. Based on various assertions from the past researches, it would be difficult to judge which process of knowledge management is the most significant and essential for project-based organisations. Along with this theoretical background, the subsequent chapter explores the appropriate research method to explore the role of knowledge management in project-based organisations.
Chapter 3  Research Methodology

3.1 Introduction

Research design is a general plan for conducting the research work, which answers research questions. Furthermore, it will usher the researcher to go towards the right directions for completing the entire research work. Before going on a trip, people will make an itinerary to prevent wasting time and money. It might be similar to establish appropriate research methods or strategies, when a researcher enters the territory of research. Myers and Avison (2002) point out a research method as “a strategy of inquiry which move from the underlying philosophical assumptions to research design and data collection. The choice of research method influences the way in which the researcher collects data. Specific research methods also imply different skills, assumptions, and research practices”. As a result, research methodology is a blueprint of the research for collecting data, measuring, and analysing the research data. In this chapter, the first part discusses the distinction between method and methodology and the debate of philosophical backgrounds of the research is dealt with in the following section. The second part focuses on the research design; differences between qualitative, quantitative, and mixed methods are presented in this section. The final part of this chapter explains the overall research method of this study.

3.2 Differences between method and methodology

People may use the term method and methodology interchangeably in a daily life. However, it is required to strictly distinguish differences between both terms in academic terminology. Research methodology is a guideline for solving problems with a combination of techniques used to enquire a specific situation. It refers to the procedural framework within which the research is conducted (Creswell, 2009) as well as it provides the theoretical perspective that links research problems with a particular method or methods (Hesse-Biber, 2010). There are many factors for selecting the appropriate methodology with response to topics, subjects, and researchers’ point of views. Saunders et al. (2009) state that researchers who are studying similar topics have close research methodology, whereas it will be dependent upon the researcher’s decision to adopt the best methodology to carry out the inquiry work.
On the other hand, a research method has a different facet compared with a research methodology. Methods refer to specific research techniques and approaches to collect and analyse data (Saunders et al., 2009; Easterby-Smith et al., 2012). Hesse-Biber (2010) notes that a method is a tool that derives from research methodology and the research methodology will be an important determinant for utilised specific tools. For example, interviews and observations might be useful forms of data collection methods, when a researcher wants to gather participants’ point of views and their voice. Similarly, surveys or questionnaires could be one of the efficient ways of collecting vast amounts of data from a number of samples as well as would be a convenient method to justify the phenomena and to formulate theories to explain the situations. Data analysis approaches such as case study, grounded theory, narrative study, and ethnography would be examples of data analysis method of qualitative research. Thus, a research would be carried out by the researcher with the philosophical background which is the fundamental guidelines of the overall research direction, and specified research methodology which is a combination of techniques (i.e. research methods) used to inquire into a specific situation or phenomenon.

3.3 Philosophical background of research methodology

It is important for the researchers to understand philosophical backgrounds of research methodology. They could have a significant impact on the overall research, which is undertaken from design to conclusions. The understanding of research philosophy may enable the researcher to recognise which research designs would work and which would not (Easterby-Smith et al., 2012; Saunders et al., 2009; Creswell, 2007). The central debates of philosophical background of the research would be the concerns of ontology and epistemology. The following section deals with the further explanation of each of these research philosophies as well as linking them into the research methodology of this study.

3.3.1 Ontology

The first debates in terms of research philosophies would be ontology. Ontology is the nature of reality and the existence of the entities (Easterby-Smith et al., 2012; Saunders et al., 2009). That is, ontology is the philosophical assumptions about the nature of reality.
One of the important aspects of ontology is how the individual researcher views the world and how to understand the reality. The attitude towards the reality would depend upon the researchers points of view to the world. That is, ontology describes the individual researcher’s points of view on the nature of reality, which would be an objective reality that really exists or only a subjective reality, created in our minds.

The most important issue regarding ontology is how we view the realities and how we perceive the realities. In other words, the ontological issues debate on the existence of subjective realities, which are dependent upon the individuals’ paradigms, frameworks and viewpoints, or objective realities, which are absolutely independent from one’s subjective decisions and perceptions to the entities or phenomenon. In this context, one of the most significant elements to approach ontology is a dispute between objectivity and subjectivity (Easterby-Smith et al., 2012; Saunders et al., 2009). Sanders et al. (2009) divide ontology into subjectivism and objectivism depending upon an individual’s point of view with respect to social phenomenon. Whilst objectivism regards social entities as independent from social actors, subjectivism considers social entities or phenomena are interconnected or dependent upon the social players. The objectivists’ stance on ontology assumes that the entities with consisting of similar structure, or elements would indicate similar characteristics and structures. Moreover, this view emphasises the structural aspects or macro-level of the entities or phenomena rather than micro-level or individual facets. On the other hand, the subjectivists presume that it would be impossible to exist the same entities but each reality would be decided by individual researchers points of view towards the entities or phenomena. Subjective ontology suggests that social phenomena would be closely related to each element or individual features as well as the result of interaction between the members. While Saunders et al. (2009) categorise ontological stances into two aspects (i.e. objectivism and subjectivism), Easterby-Smith et al. (2012) divide it into four approaches more delicately. According to Easterby-Smith et al. (2012), there are four different lenses to view the entity in the world; realism, internal realism, relativism, and nominalism (See Table 3.1).
<table>
<thead>
<tr>
<th>Ontology</th>
<th>Realism</th>
<th>Internal realism</th>
<th>Relativism</th>
<th>Nominalism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Truth</strong></td>
<td>Single truth</td>
<td>Truth exists but is obscure</td>
<td>There are many ‘truths’</td>
<td>There is no truth</td>
</tr>
<tr>
<td><strong>Facts</strong></td>
<td>Facts exist and can be revealed</td>
<td>Facts are concrete but cannot be accessed directly</td>
<td>Facts depend on viewpoint of observer</td>
<td>Facts are all human creations</td>
</tr>
</tbody>
</table>

Table 3.1 Four different ontologies (Source: Easterby-Smith et al., 2012)

### 3.3.2 Epistemology

Closely coupled with ontology, epistemology considers viewpoints about the most appropriate ways of enquiring into the nature of the world (Easterby-Smith et al., 2012), ‘what is knowledge and what are the sources and limits of knowledge (Eriksson and Kovalainen, 2008), and ‘what constitutes acceptable knowledge in a field of study’ (Saunders et al., 2009). According to Eriksson and Kovalainen (2008), epistemology is the constant pursuing to discover ‘what is knowledge and what are the sources and limits of knowledge’. Blaikie (1993) describes epistemology as ‘the theory or science of the method or grounds for knowledge expanding this into a set of claims or assumptions about the ways in which it is possible to gain knowledge of reality. While there are myriad of debates of epistemological choices, the approaches to investigate on the truth, knowledge, or reality could be categorised into two main discussions in terms of the epistemological approaches: positivism, and social constructivism (Saunders et al., 2009; Easterby-Smith et al., 2012).

The main concept of positivism presumes that a world exists that is external and theory neutral, and its properties should be measured by objective methods such as quantifiable numbers, experiments, and questionnaires (Easterby-Smith et al., 2012; Bryman, 2012). This philosophical stance is closely relevant to natural science and the researcher would prefer to generalise the studied phenomena into formula, laws, or general theories. Moreover, it is preferable for the researchers who adopt this point of view to use a highly structured methodology to replicate the same or similar results. On the other hand, the other side of epistemology is social constructivism that emphasises on the subjective intervention of the researchers to discern the reality in the world. The argument of
positivism in social science stems from the viewpoints that reality is not an object and exterior (Easterby-Smith et al., 2012; Blaikie, 1993). That is, the reality is socially constructed and interpreted by people. The summary of comparisons between positivism and social constructivism is described in Table 3.2.

<table>
<thead>
<tr>
<th></th>
<th>Positivism</th>
<th>Social constructivism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The observer</strong></td>
<td>Must be independent</td>
<td>Is part of what is being observed</td>
</tr>
<tr>
<td><strong>Human interests</strong></td>
<td>Should be irrelevant</td>
<td>Are the main drivers of science</td>
</tr>
<tr>
<td><strong>Explanations</strong></td>
<td>Must demonstrate causality</td>
<td>Aim to increase general understanding of the situation</td>
</tr>
<tr>
<td><strong>Research progresses through</strong></td>
<td>Hypotheses and deductions</td>
<td>Gathering rich data from which ideas are included</td>
</tr>
<tr>
<td><strong>Concepts</strong></td>
<td>Need to be defined so that simplest terms</td>
<td>May include the complexity of ‘whole’ situations</td>
</tr>
<tr>
<td><strong>Generalization through</strong></td>
<td>Statistical probability</td>
<td>Theoretical abstraction</td>
</tr>
<tr>
<td><strong>Sampling requires</strong></td>
<td>Large numbers selected randomly</td>
<td>Small numbers of cases chosen for specific reasons</td>
</tr>
</tbody>
</table>

Table 3.2 Comparisons between positivism and social constructivism (Source: Easterby-Smith et al., 2012)

3.3.3 Linking to the philosophical backgrounds to this study

Both philosophical backgrounds would affect the researchers’ viewpoints towards the studied topic or phenomenon. Furthermore, two different philosophical stances would coexist in order to determine the appropriate research methods and strategies, and to guide the overall research direction. Based on the aforementioned ontological and epistemological approaches, it would be possible to link between them with positivism fitting with realistic ontologies, and constructionism fitting with nominalism (Easterby-
Smith et al., 2012). The correspondence is summarised in Table 3.3. As seen in Table 3.3, different combination of philosophy would have various research settings.

<table>
<thead>
<tr>
<th>Ontologies</th>
<th>Realism</th>
<th>Internal realism</th>
<th>Relativism</th>
<th>Nominalism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistemology</td>
<td>Strong positivism</td>
<td>Positivism</td>
<td>Constructionism</td>
<td>Strong constructionism</td>
</tr>
<tr>
<td>Aims</td>
<td>Discovery</td>
<td>Exposure</td>
<td>Convergence</td>
<td>Invention</td>
</tr>
<tr>
<td>Starting point</td>
<td>Hypothesis</td>
<td>Propositions</td>
<td>Questions</td>
<td>Critique</td>
</tr>
<tr>
<td>Designs</td>
<td>Experiment</td>
<td>Large surveys; multi-cases</td>
<td>Cases and surveys</td>
<td>Engagement and reflexivity</td>
</tr>
<tr>
<td>Data types</td>
<td>Numbers and facts</td>
<td>Numbers and facts</td>
<td>Words and numbers</td>
<td>Discourse and experiences</td>
</tr>
<tr>
<td>Analysis</td>
<td>Verification / falsification</td>
<td>Correlation and regression</td>
<td>Triangulation and comparison</td>
<td>Sense-making; understanding</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Confirmation of theories</td>
<td>Theory testing</td>
<td>Theory generation</td>
<td>New insights and actions</td>
</tr>
</tbody>
</table>

Table 3.3 Linking with ontologies and epistemologies (Source: Easterby-Smith et al., 2012)

Liking the philosophical background to the study of knowledge management, one of the unique natures of knowledge, which is tacitness, makes it clear of research philosophy regarding this study. Moreover, knowledge sharing is considered as a social process in which the individuals mutually exchange their knowledge and as a result of such processes, new knowledge is produced through knowledge sharing with others. Thus, the research’s issues in this study could be conducted by examining the phenomenon (i.e. knowledge management and knowledge sharing) through the individuals’ interpretations and perceptions. These situations are socially constructed and are the outcome of the personal interactions with others. In other words, in this study, it would be important to comprehend the subjective reality of the participants in order to identify their motives,
activities, and intentions, which are meaningful and significant to the research participants. In summary, the main point of view toward the world is that it is socially constructed and the individuals create their own world through one’s own lens which is their perceptions and interpretations.

3.4 Types of research design

The research design is conventionally divided into two aspects, which are qualitative and quantitative methods. Many academics and methodological purists have drawn a line between qualitative and quantitative research, and they have treated both of them are as opposite ends of a spectrum (Singh, 2007). This dichotomy, however, is changed over time, and a number of researchers agree that there are no absolute qualitative or quantitative research methods (Teddlie and Tashakkori, 2009, Hesse-Biber, 2010, Johnson and Onwuegbuzie, 2004). In addition, many academics concur that adopting both research methodological advantages will make it possible to answer for recent complex and complicated matters and phenomenon (Creswell and Clark, 2007). Due to these reasons, mixed research methods are coming to the stage of research methods and these might be good alternatives to supplement of pitfalls of qualitative and quantitative research methods. In this part of the chapter, qualitative, quantitative and mixed research methods are considered to the main discerns of research types.

There are many criterions to categorise research methods and numerous methodologists have suggested the norms to distinguish different approaches. For instance, one of the most frequently used grouping parameters is the type of data such as quantifiable, numerical or verbal data. In this standard, numerical data is the main source of quantitative methods and texts or images are the essential materials for qualitative methods. Creswell (2009) suggests the classification of research methods strategies not depending on merely the types of data. According to Creswell (2009), the main determinants of these research methods are composed of worldviews, strategies, and data collection methods (See Figure 3.1). In this context, worldview is a philosophical background affecting the researchers’ recognitions towards the world in which the researcher is working or living in. Strategies are guidelines for specific procedures, and directions, which will lead the researcher on the right line. Methods are detailed and specified techniques and practices for collecting, analysing and interpreting data.
In the following section, the author explains and discusses the details of three research approaches based on philosophical backgrounds, research questions, and data collection techniques. Furthermore, the comparisons amongst three different methods are indicated to provide clear and deeper understandings of them. In the last part of this sub-chapter, the adopted researcher method of this study is also presented.

3.4.1 Qualitative research methods

There are many approaches to investigate on the research questions, and some of them may be difficult to measure and quantify, so it would be better to delineate and articulate in the forms of paragraphs and sentences. Qualitative research is a set of exploring, interpretive, inductive and transforming activities for human behaviours and problems (Creswell, 2009). In this context, qualitative researchers locate in the world using natural settings to understand the meanings, and they will try to make the world invisible to explicit practices (Denzin and Lincoln, 2003). In consequence, it is useful to understand complex human behaviours and relationships as well as to explain certain phenomena and situations in terms of participants’ viewpoints (Sofaer, 1999).
Qualitative research methods compose of constructivist, interpretivist, advocacy or participatory paradigms. Paradigm came to the stage with the contemporary meaning by Thomas Kuhn and he states that paradigm is “the set of practices that define a scientific discipline at any particular period of time”. Another comment of paradigms is that, it is a type of lenses that people are able to see the world. As a result, these lenses will affect researchers’ behaviours and ways of thinking to conduct researches and responds (Creswell, 2009). So it is important for researchers to understand paradigms and to possess adequate worldview to carry out the researches (Saunders et al., 2009). One of the common natures among constructivism, interpretivism and advocacy is subjectivity. Researchers will interpret or translate phenomena with their own words based on past experiences, educations, or social norms. Therefore, we can conclude with the important point of qualitative research methods, which is the subjective nature.

Most of qualitative researches are related to social, cultural, ethnic aspects of matters and so it is difficult to express numerical data format (Saunders et al., 2009). These substances are delicate, subjective, and complex so the participants’ meanings are essential to collect and interpret data (Creswell, 2007; Creswell, 2009; Johnson and Onwuegbuzie, 2004). Researchers collect data in natural settings as well as multiple sources to understand and carry out the work. The presentation of data in qualitative methods is verbal style of information such as texts, drawing, images and so forth (Saunders et al., 2009). Due to the characteristics of verbal or textual consequences, it is possible to depict in rich detail and to describe complex phenomena and relations between variables (Johnson and Onwuegbuzie, 2004). Hence, it can be summarised that qualitative research methods are an observer’s interpretive and subjective activity with various sources of data such as interviews, observation, and so forth. Furthermore, the researcher will make explicit practices without controlling participants’ environments and these results could possibly change the world.

While many researchers have suggested various types of strategies, the individual researchers may have to select the best appropriate and suitable methods for the inquiry. The most frequently used strategies in qualitative researches are phenomenological research, grounded theory, ethnography, narrative research and case study (Creswell, 2009). Saunders et al. (2009) suggest three most common qualitative research approaches in business and management research as grounded theory, case study, ethnography and
archival research. Each study will be conducted through different strategies and approaches depending on the nature purposes and constraints of the research. There is a brief description of each qualitative research approaches in Table 3.4.

<table>
<thead>
<tr>
<th></th>
<th>Narrative research</th>
<th>Phenomenology</th>
<th>Grounded theory</th>
<th>Ethnography</th>
<th>Case study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus</strong></td>
<td>Exploring the life of individual</td>
<td>Understanding the essence of the experience</td>
<td>Developing a theory grounded the field</td>
<td>Describing and interpreting a culture-sharing group</td>
<td>Developing an in-depth description and analysis of a case or multiple cases</td>
</tr>
<tr>
<td><strong>Type of problems</strong></td>
<td>Individual experiences</td>
<td>Description of the essence of a lived phenomenon</td>
<td>Grounding a theory in the views of participants</td>
<td>Shared patterns of culture of a group</td>
<td>In-depth understanding of a case or cases</td>
</tr>
<tr>
<td><strong>Unit of analysis</strong></td>
<td>One or more individuals</td>
<td>Several individuals that have shared the experience</td>
<td>A process, action or interaction involving many individuals</td>
<td>A group that shares the same culture</td>
<td>An event, a programme, an activity, more than one individual</td>
</tr>
<tr>
<td><strong>Data collection forms</strong></td>
<td>Interviews and documents</td>
<td>Interviews with individuals although documents,</td>
<td>Interviews with 20 ~ 60 individuals</td>
<td>Observation and interviews</td>
<td>Multiple sources, such as interviews, observations, documents and artefacts</td>
</tr>
<tr>
<td><strong>Data analysis strategies</strong></td>
<td>Stories, “restoring” stories, developing themes, often using a chronology</td>
<td>Significant statements, meaning units, textual and structural description, description of the “essence”</td>
<td>Through open coding, axial coding, selective coding</td>
<td>Description of the culture-sharing group; themes about the group</td>
<td>Description of the case and themes of the case as well as cross-case themes</td>
</tr>
</tbody>
</table>

Table 3.4 Comparisons among the different qualitative approaches

(Source: Creswell, 2009 and Saunders et al., 2009)

The grounded theory method was developed in sociology by Glaser and Strauss who felt that research methods used at that time were inappropriate to reflect on the research participants’ voices and to consider each research setting. The definition of grounded theory is “a theory that was derived from data, systematically gathered and analysed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another” (Corbin and Strauss, 2008). Based on
this definition of the grounded theory method, this approach is concerned with generating theories, which makes it different from other methods, which concerns testing theories, verifying hypotheses or providing the description of researched issues. Thus, the grounded theory method is regarded as one of the best approaches for inductive analysis and a theory building approach (Denzin and Lincoln, 2011; Bowen, 2006; Annells, 1996).

![Figure 3.2 The grounded theory method (Source: Adolph et al., 2011)](image)

3.4.1.1 **Grounded theory method**

The key task of conducting the grounded theory method is to develop theories through constant comparative analysis (see Figure 3.2). In addition, the researcher who is adopting this approach would carry out continuous and simultaneous research, since this approach is continuous and simultaneous in data collection and analysis of them until the consequences are sufficient and saturated by the grounds (Corbin and Strauss, 2008). The grounded theory method will be useful when a researcher is not familiar with a certain topic or subject and a researcher is not sure about consequences and effects from the research (Saunders et al., 2009; Fendt and Sachs, 2008; Martin and Turner, 1986; Mills et al., 2006). Saunders et al. (2009) recommend the grounded theory for achieving underpinned theoretical bases and frameworks to produce concrete and valuable consequences. The basic procedures of grounded theory are aligning with general approaches of qualitative research (i.e. collecting data, analysing data and generalising from analysis). The constitution of grounded theory method could be summarised as: open coding and categorisation of data; concurrent data generation or collection and
analysis; writing memos; theoretical sampling; constant comparative analysis; theoretical sensitivity; selecting core category; theoretical saturation; and theoretical integration.

3.4.1.1 Open coding and categorisation of data
This is the first step of conducting the grounded theory which identifies important words, or groups of words, and groups them together in similar labels. There are various terminologies to describe processes in the grounded theory method depending upon each theorist. For instance, while Glaser (1992) coined this step as ‘initial coding’, Corbin and Strauss (2008) spelled out as ‘open coding’. The researcher of this study adopted Corbin and Strauss’s (2008) terminology in order to prevent further confusion arisen from the interchanging usage of the terminologies.

3.4.1.2 Concurrent data generation and analysis
One of the prominent aspects of conducting the grounded theory method is that the researcher would collect data and analyse them at the same time. In order to fulfil this, the researcher normally collects data from purposively selected samples. The gathered data in the fields would be coded before the next data is collected. During this data analysis, new research questions are emerged and these new questions would make it possible for the researcher to generate more abstract level of constructs.

3.4.1.3 Writing memos
Memos in the grounded theory are specialised written materials that contain the researchers ideas and analysis of data during the analysis procedure. ‘Memo writing’ is not only the written records, which contains the results of the analysis but also the core of data analysis in the grounded theory method. In this method, memo is not merely writing down one’s ideas but it is a record of researcher’s thinking and a pivotal material to connect the initial data analysis and the further theory generation. Writing memo would continue throughout the entire research process to generate and synthesise all the finding of the research (Corbin and Strauss, 2008; Charmaz, 2006).
3.4.1.4 Theoretical sampling

One of the unique natures of the grounded theory method is the sampling method, which is distinctive from other qualitative research methods. Theoretical sampling is a constant comparative analysis of the data until the data is saturated when the moment no more new concepts or theme emerge (Corbin and Strauss, 2009; Charmaz, 2006). For theoretical sampling, the researcher would determine the informants who would provide rich and fruitful information to corroborate the studied phenomenon.

3.4.1.5 Constant comparative analysis

As the researcher collects data along with analysing them, he or she would conduct a constant comparison of incident to incident, incident to codes, codes to codes, codes to categories, and categories to categories (Corbin and Strauss, 2008; Rennie, 2006). This process continues until the grounded theory is fully integrated and saturated with the theoretically selected samples. The grounded theory method is one of the inductive research methods, which build up the theory from the collected data. In order to generate satisfied theory in the grounded theory method, induction of theory should be carried out successfully. According to Corbin and Strauss (2008), this comparative analysis is “essential to all analysis because it allows the researcher to discern one category from another and to identify properties specific to that category”.

3.4.1.6 Theoretical sensitivity

Theoretical sensitivity is the personal researcher’s level of understanding the data, which reflects their level of insights into the data and research areas. In addition, it also depends on the researcher’s intellectual history, which includes the level of reading, and absorbing it and interpret it into the new theory or insights. As the grounded theory data becomes immersed in the data, the individual researcher’s theoretical sensitivity would be important as to how he or she interprets and analyses the data, and how he or she would set up the overall research direction and further data collection.

3.4.1.2 Ethnographic research, and case study

Although the grounded theory will develop a theory from examining many individuals, the main intention of ethnographic research is to provide in-depth description and
interpreting of everyday life and practice with natural settings in a large number of groups (Creswell, 2007; Creswell, 2009). This research will take a long-term engagement in the field setting to understand the life of participants and their meanings. In addition the researcher will become a member of an organisation and the role of the researcher could be both of an observer and a participant.

If a researcher wants to find out contemporary phenomena, problems and difficulties in the real life contexts, a case study approaches will be valuable to perform an inquiry of work. A case study is an in-depth study of the particular studied phenomenon (a case) or phenomena (cases) through detailed data collection with multiple sources of information and it will expand a researcher’s understandings (Ruddin, 2006; Creswell, 2009; Eisenhardt, 1989; Yin, 2009). The significantly different aspect of a case study compared to surveys and experiments is that a researcher will not control and manipulate the external environment of variables (Saunders et al., 2009). In other words, the researcher could control the other factors and variables that would affect the results during experiments and surveys as well as they would obtain results from the controlled environments. On the other hand, a researcher conducting a case study will observe or conduct an interview in the real context of the researched case or cases so it may be impossible to control the research. Generally, there are two types of case studies, which are a holistic and embedded case study. In the former type, a researcher will be a member of a certain scrutinised organisation, and conduct the research as holistic. That is, the research will consider, and treat the organisation as a whole. In the latter, the researcher will disassemble the target with logical sub-units. The researcher will behave as a member of the organisation as an embedded position. One of conventional critiques about a case study is the number of cases that will be accepted for generalisation (Ruddin, 2006).

There are various different types of qualitative research methods, therefore it would be impossible to deal with all of the in this section of the chapter. So far, I identified three most relevant qualitative research methods regarding knowledge management. The other frequently applied qualitative research methods in social science are summarised in Table 3.4. While qualitative research methods are notable strategies to explain and describe in social, cultural, or ethnic matters, they have drawbacks in some points. First of all, it is complicated for the researcher to generalise other people or other settings. The
findings may be unique to the relatively few people included in the research work. The uniqueness will be useful when researchers try to account features of local populations. One of the goals in a research is pursuing a general value and finding out universal law to explain and adopt their findings. It is considered that qualitative research methods are superficial and inefficient rather than pragmatic. Secondly, qualitative methods need more time and effort for collecting and analysing data compared to quantitative methods. In addition, researchers will hardly forecast the results or trends of the study. Also, the quality of the study would be dependent upon the researcher’s skills. In particular, the data collection such as interviews and observations would be influenced on the researcher’s experiences and insights. The last pitfall is the personal biases and idiosyncrasies that will influence the research work. Despite of these disadvantages, the qualitative research method would provide an in-depth and detailed understanding of the studied subject, and avoid the researcher’s pre-conceptions and prejudices regarding the topic.

In a nutshell, qualitative researches are dealing with human life, stories about human beings, organisational behaviours, social activities and interactions among members that could not depict to numerical and statistical approaches. Overall characteristics of qualitative research methods can be concluded to subjective and deductive approaches as well as useful methods for performing exploratory nature of researches. The characteristics of the qualitative research methods are showed in Table 3.5 as follows.

<table>
<thead>
<tr>
<th>World view (Paradigm)</th>
<th>Strategies / Approaches</th>
<th>Data Collection methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative research methods</td>
<td>• Constructivists</td>
<td>• Phenomenology</td>
</tr>
<tr>
<td></td>
<td>• Interpretivist</td>
<td>• Grounded theory</td>
</tr>
<tr>
<td></td>
<td>• Advocacy / Participatory</td>
<td>• Ethnography</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Narrative research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Case study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open-ended questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Emerging approaches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Images / texts</td>
</tr>
</tbody>
</table>

Table 3.5 Characteristics of qualitative research methods (Source: Creswell, 2009)
3.4.2 Quantitative research methods

The general characteristics of quantitative research methods seem to be the opposite of qualitative research methods. Briefly covering, the main features of quantitative methods are through scientific and numerical ways of inquiring. The main data source of quantitative research methods is based on objective raw numbers, quantifiable, and measurable numerical factors. In addition quantitative researchers’ works are highly structured design and rigid approaches in order to verify predetermined hypotheses (Duffy, 1987). Respondents of the quantitative research will answer to the multiple-choice, pre-determined and close-ended questions or write down short sentences for the enquiries during a typical survey or questionnaire (Saunders et al, 2009; Creswell, 2009; Singh, 2007; DePaulo, 2000).

Researchers utilising quantitative research methods tend to verify or scrutinise phenomena which could be depicted in numbers. This behavioural characteristic is aligning with the philosophy of positivism or post-positivism (Creswell, 2009). The basic concept of both philosophical viewpoints is that the best approach to prove occurrences or phenomena of human beings is through scientific methods, and only science will discover the unknown and undiscovered world. In addition, positivists and post-positivists are considering that researchers are observing the world as an outsider of the entity and not the living creature or residents. Therefore, inquirers are objective and putting aside their opinions and viewpoints. Furthermore, empirical researches consider the best approaches to verify relationships between causes and effects by positivists and post-positivists. Quantitative researches are also pursuing to imitate and replicate the same results, and collect the stable consequences in order to generalise or achieve reliability (Duffy, 1987). Even though qualitative research methods are managing specific variables, and controlled populations it can be generalised and applied to a large number of people (Johnson and Onwuegbuzie, 2004).

The most frequently conducted data collection strategies of quantitative researches could be through a survey and an experiment. First of all, experiments are popular data gathering methods in business, management research, natural science, and engineering researches to verify hypnoses and phenomena (Saunders et al., 2009). In addition, many scientists and engineers consider that an experiment is the ideal way of collecting data in
most of the quantitative researches (Singh, 2007). The purposes of experiments are figuring out the relationships among variables, and verify people’s assumption about causes-and-effects. Another technique is a survey, which will accumulate large number of quantifiable data within a short-term period of time as well as remote locations utilising various mediums (e.g. postal mails, emails, telephones and webpages). Surveys are useful to appreciate the overall trend of large number of populations using standardised questions or questionnaire. In addition, surveys are easy to understand and persuade others because numerical or quantifiable data are the main source of grounds for researchers’ assertion and hypotheses (Saunders et al., 2009).

Despite of aforementioned characteristics and advantages of quantitative research methods, they have several shortcomings. First of all, it is chasing generalisation and replication of certain phenomena and so minority of the results would be overlooked and intentionally omitted (Johnson and Onwuegbuzie, 2004). Another problem stemmed from generalisations may be that the created knowledge would be too broad and general to implement to specific local cases or changeable situations. The last point is that the researchers may drop out on phenomena because they are trying to verify and test the theories rather than theory generation or building.

<table>
<thead>
<tr>
<th>World view (Paradigm)</th>
<th>Strategies / Approaches</th>
<th>Data collection methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative research methods</td>
<td>• Positivist</td>
<td>• Survey</td>
</tr>
<tr>
<td></td>
<td>• Post-positivist</td>
<td>• Questionnaire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Experiment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Closed-ended questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pre-determined approaches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Numerical data</td>
</tr>
</tbody>
</table>

Table 3.6 Characteristics of quantitative research methods (Source: Creswell, 2009)

The overall characteristics of quantitative research methods are indicated in this section and they are as follows. Firstly, quantitative research methods are conducted and organised by numerical and statistical data. Secondly, quantitative research methods are pursuing to objectivity and absolute truth of phenomena to generalise and replicate in large amount of cases. The last, closed-ended questions and pre-determined approaches are frequently for used data collection techniques and a researcher is the main character...
or the research. The characteristics of quantitative research methods are summarised in Table 3.6.

3.4.3 Comparison between qualitative and quantitative research methods

It is needed to articulate the differences between qualitative and quantitative research methods before moving to mixed methods research because the origins of each method are from different perspectives and philosophical backgrounds (Duffy, 1987). Many academics from methodological purists to advocates of mixed research methods have been trying to discern and delineate comparisons and differences between qualitative and quantitative research methods (Duffy, 1987; Sunders et al., 2009; Teddlie and Tashakkori, 2009; Hessel-Bibber, 2010).

First of all, the main difference between qualitative and quantitative research is the purposes of research. Qualitative research concentrates on understanding phenomena and comprehending certain occurrences within bounded and specific circumstances. Qualitative researchers are trying to examine the overall trends within every context and to interpret meanings within participants’ world rather researchers’. In contrast, quantitative researchers are pursuing to explain relationships between causes and effects, and their research work is a quest for finding out an absolute and objective truth.

Secondly, the approaches towards consequences are quite different from qualitative and quantitative research. The former researchers are running after specific methods to be suitable for each case utilising deductive ways of thinking. On the other hand, the latter researchers, quantitative researchers, are employing inductive thinking to produce predictable and replicable consequences with respect to a large amount of data.

Thirdly, difference between qualitative and quantitative research methods is the role of the researcher. Researchers will amalgamate with the research participants, and they will try to understand and discover answers with participants’ viewpoints in qualitative research methods. Thus, research participants’ or interviewees might be the main character of research during qualitative research work. Whereas researchers will control
and manipulate everything during quantitative research work such as experiments and surveys.

The last may be the fundamental differences between two approaches that are the type of data in the qualitative and quantitative research. Many academics stress this point as the first priority of differences between qualitative and quantitative research methods. Qualitative research data will express with verbal, and textual manner while quantitative research work will be depicted with numerical and statistical data. These may be the most essential differences and the simplest way to discern between two approaches. The comparisons between two different research methods are described in Table 3.7.

<table>
<thead>
<tr>
<th>Qualitative</th>
<th>Quantitative</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of researches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Understand phenomena</td>
<td>• Explain causes</td>
<td>Firestone (1987)</td>
</tr>
<tr>
<td>• Contextualisation</td>
<td>• Generalisation</td>
<td>Cresswell (2009)</td>
</tr>
<tr>
<td>• Participants’ meanings</td>
<td>• Absolute and objective</td>
<td></td>
</tr>
<tr>
<td>• Validity</td>
<td>• Reliability</td>
<td>Duffy (1987)</td>
</tr>
<tr>
<td>Approaches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Deductive</td>
<td>• Inductive</td>
<td>Saunders et al. (2009)</td>
</tr>
<tr>
<td>• Cross-case comparisons</td>
<td>• Predictable</td>
<td>Johnson and Onwuegbuzie (2004)</td>
</tr>
<tr>
<td>• Case-by-case / specific to</td>
<td>• Replicable</td>
<td>Johnson and Onwuegbuzie (2004)</td>
</tr>
<tr>
<td>each case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position of researchers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Insiders’ perspective</td>
<td>• Outsiders’ perspective</td>
<td>Duffy (1987)</td>
</tr>
<tr>
<td>• Participants’ point of</td>
<td>• Researchers’ point of</td>
<td>Cresswell (2009)</td>
</tr>
<tr>
<td>views</td>
<td>views</td>
<td></td>
</tr>
<tr>
<td>Condition of data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Specific variables</td>
<td>• Holistic and wide rage of</td>
<td>Duffy (1987)</td>
</tr>
<tr>
<td>• Theoretical data</td>
<td>data</td>
<td></td>
</tr>
</tbody>
</table>
| Table 3.7 Comparisons between quantitative and qualitative research methods
(Source: Creswell, 2009, Bryman, 2012 and Saunders et al., 2009)
3.4.4 Mixed methods research

There are many debates on the definition and the extent of mixed methods (Johnson et al., 2007). Despite of these arguments on the definition, the general definition of mixed methods is combining both qualitative and quantitative research methods in one study (Creswell, 2009), and it is different from multi-methods study (Saunders et al., 2009). Whilst mixed methods are collecting and analysing data utilising both approaches, multi-methods researches are conducting two or more research techniques in one inquiring work either quantitative or qualitative. That is, a researcher will perform simultaneously grounded theory and case study approaches in one qualitative research work, or survey and experiment will be conducted in one quantitative research work. In contrast, conducting mixed methods research a researcher will adopt one from qualitative methods approaches (i.e. grounded theory, case study, phenomenology, action research etc.), and others from quantitative research techniques (i.e. questionnaire, survey, experiment etc.).

Johnson et al. (2007) conduct a research for finding out definitions of mixed methods research and they make a general definition toward mixed methods research. According to them, they define mixed methods research as “Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and corroboration”. Thus, mixed methods are not criticism or replacement for either qualitative or quantitative research methods, but a synthesis of both methodological approaches that will minimise drawbacks and enhance advantages of each method. If one makes a visible figure for positioning and categorising mixed methods, the location of mixed methods might be the middle of quantitative and qualitative research continuum (Johnson and Onwuegbuzie, 2004; Kaplan and Duchon, 1998).

There are various types of mixed methods research. Teddlie and Tashakkori (2009) assert that the type of mixed methods research is dependent upon the number of phases and type of methods. They suggest that simplified “The methods-strands matrix” to present typology of mixed methods researches (See Table 3.8). Monostrand-monomethod design (Cell 1) is typical and pure single research method that the researcher will select one main research approach either qualitative or quantitative but not both. Monostrand-
multistrand (Cell 2) is close to multi-methods approaches rather than mixed methods, that is the researcher will conduct two or more research techniques from same research approach (e.g. Performing both qualitative research approaches of case study and grounded theory in one research). In this mixed research methods, the researcher will employ two or more approaches either simultaneously (i.e. parallel monomethod) or chronological order (i.e. sequential monomethod). Teddlie and Tashakkori (2009) state the simplest form of mixed methods designs are mixed methods-monostrand strategy (Cell 3). However, this strategy is not fully integrated mixed methods, and the researcher will utilise one type of data so they are called quasi-mixed designs. Cell 4 in Table 3.8 is the most complex design of mixed methods and so-called mixed methods in literature are this type of mixed methods. Parallel mixed designs are both qualitative and quantitative approaches will be adopted concurrently. Sequential mixed designs will be performed with a consecutive manner (e.g. Qualitative → Quantitative or Quantitative → Qualitative) and the researcher will determine the priority of research approaches.

<table>
<thead>
<tr>
<th>Design Type</th>
<th>Monostrand designs</th>
<th>Multistrand designs</th>
</tr>
</thead>
</table>
| Monostrand designs           | **Cell 1** Monomethod monostrand designs  
1. Traditional Quan designs  
2. Traditional Qual designs | **Cell 2** Monomethod multistrand designs  
1. Parallel monomethod  
a. QUAN + QUAN  
b. QUAL + QUAL  
2. Sequential monomethod  
a. QUAL → QUAL  
b. QUAN → QUAN |
| Mixed methods designs        | **Cell 3** Quasi-mixed monostrand designs  
1. Monostrand conversion design | **Cell 4** Mixed methods multistrand designs  
1. Parallel mixed designs  
2. Sequential mixed designs  
3. Conversion mixed designs  
4. Multilevel mixed designs  
5. Fully integrated mixed designs  
Quasi-mixed multistrand designs |

*Note: QUAN is Quantitative and QUAL is Qualitative*

Table 3.8 The methods-Strands matrix (Source: Teddlie and Tashakkori, 2009)
3.4.5 Selection of research method in this research

The selection of method depends on the type of research questions, the level of control the researcher has over actual behavioural events and whether the focus is on contemporary or historical events. The research method also requires to fit in with the researcher’s methodological assumptions as well as the researcher should be comfortable with the method. This study is mainly conducted through qualitative method based on the ontological stance with relativism and the epistemological backgrounds from social constructivism perspectives (see section 3.3.3 Linking to the philosophical backgrounds to this study). Along with these research philosophical grounds, the main data collection techniques to support the overall research process would be an interview method. In addition, the applied data analysis technique of this study is the grounded theory method.

Whilst there are a number of reasons for adopting the grounded theory method for analysis of data in this study, the main reasons can be summarised into three folds. Firstly, when a researcher is not only familiar with the certain topic or subject but also unsure towards the consequences and effects of the research, the strategy of grounded theory would be useful to overcome such uncertainty and unfamiliarity. Since there are limited theoretical frameworks of knowledge management and knowledge sharing studies in the project management context, the researcher concluded that exploratory studies would be useful to carry out. As discussed in the previous chapter, there are several researches of knowledge management studies in project management context, but most of them deal with quantitative methods to verify hypothesis and pre-determined assumptions rather than exploring current state of knowledge management in project-based organisations. Exploratory studies are useful when the researchers clarify understandings of problems and comprehend the exact nature of the problems. Moreover, the researcher would possibly search for the reasons and causes affecting specific consequences during the research work (Saunders et al., 2009). In addition, due to the nature of this study, it would not be possible to verify the previous researches, hypotheses, and theories rather discover and explore the factors influencing on knowledge management and knowledge sharing within in the project-based environment to achieve sustainable competitive advantage.
Secondly, the grounded theory method is quite an attractive data analysis approach, which is attributed as concurrent data collection and analysis method. Although there are several similarities between case study and the grounded theory method for a theory building, the procedures of conducting a research are quite different from each other. For instance, according to Yin (2009), he suggests that the overall process of case study should finish collection of data prior to analysing the collected data. On the other hand, an inquirer who utilises the grounded theory method for analysing the data would go abreast of data collection and analysis of them. That is, the grounded theory method would help the researcher commence data collection procedure without any solid theoretical frameworks as well as conduct the research without completion of data collection prior to analysing them. Nonetheless, it does not mean that the researcher could ignore or defer the existing literature and theories. However, anyone who is using the grounded theory should be more careful to listen to the research participants’ voices in order to gather more fruitful and rich data (Corbin and Strauss, 2008; Charmaz, 2006). Through the grounded theory method, the researcher can develop theories from data generated by a series of observations and the collected data form the grounds of emerging theories rather than deductions or verification of hypotheses from the existing theories (Charmaz, 2006; Creswell, 2007; Saunders et al., 2009; Urquhart, 2013).

Lastly, there are concerns of the popularity of the research methods. In the previous section, there are a number of different types of qualitative research methods such as case study, ethnography, and grounded theory methods etc. (Creswell, 2009; Saunders et al., 2009; Bryman, 2012). According to Glaser (1992), the grounded theory method is a general methodology, which can be utilised in many fields without any restrictions. Although the grounded theory method had been developed in nursing and sociology studies, it has been applied in a number of different research areas to develop substantial theories (Corbin and Strauss, 2008) including management (Locke, 2000), psychology, marketing, information studies, and knowledge management (Urquhart, 2013). Moreover, the grounded theory method can answer for the questions which require natural and uncontrolled settings. The aim of this study is not to confirm or corroborate previous theories or pre-determined hypothesis. The main purpose of this study is to build up a new theory regarding knowledge sharing in project-based organisations. Due to this reason, the selection of the grounded theory was appropriate to discover data from uncontrolled and natural settings.
In consequence, in order to overcome such unexplored, unfamiliar and uncertain research areas as well as to consider the popularity of the research methodology in various areas, the grounded theory method would be the most appropriate in conducting this research. Moreover, it was not only the best approach to answer for the research questions under uncontrolled and unpredictable settings, but also the most appropriate way to explore the research participants perspectives and behaviours regarding knowledge management and knowledge sharing within project-based organisations.

3.5 Summary

In this chapter, the author has examined the research philosophy, which would be the fundamental basis for adopting a research strategy and methods that will facilitate the research process. The two prominent philosophical backgrounds (i.e. ontology and epistemology) have been evaluated in order to establish the underlying assumptions in terms of the overall research methodology.

The three most frequently applied research methods of qualitative, quantitative, and mixed methods have been examined to assess their suitability for this study. During this investigation, quantitative research methods were indicated to be unlikely to provide fruitful outcomes in this research, since this was lack of sufficient consideration of delicate and sensitive human behaviours and actions. The degree of knowledge management and knowledge sharing would be difficult to be quantified in numbers and standardised forms of numerical criteria. Thus, qualitative research methods were selected to fulfil such uniqueness of the studied area. The qualitative research methods, which equip with descriptive and comparative analysis, would facilitate the exploration of relatively uncertain and unexplored research areas. In particular, the grounded theory method would make it possible for this study to investigate on the behaviours of knowledge management and knowledge sharing in the project-based organisations. Moreover, the grounded theory is useful to obtain fresh and rich interpretation from the actors’ point of views because of its more vibrant and frequent engagement with the research participants.
As a result, this research adopts qualitative research method, which collects data using an interview technique, based on a consideration of the research philosophies, research purpose, and research questions. The collected data are analysed by the grounded theory method, which would be the best research strategy to achieve more intelligent understanding of this research. The research framework of this study is described in Figure 3.3. In the following chapter 4, the more detailed explanation of data collection, which includes the introduction of the participating companies and the overview of the interviews, and coding procedures in this study are examined. Along with the explanation of data collection, the more explicit account of data analysis procedures is presented.
Chapter 4  Data collection and analysis procedures

4.1  Introduction

This chapter presents the overall process and methods of data collection, and data analysis procedures of this research. It begins with a brief explanation of the interview, which is one of the frequently employed methods in qualitative research. Then, it presents a description of the collected data and the profiles of the participating companies in this study. After that, an outline of the coding processes is described in order to provide broad understandings of this study. In addition, this chapter also demonstrates the relationships between the core categories based on the constructed conceptual model of this study.

4.2  Data collection process of the research work

It is essential for a researcher to collect data in order to carry out the research project. Saunders et al. (2012) indicate that selecting the most appropriate method of data collection would have to reflect on the basics of research approach, and philosophical background of the study. The following subsections of this chapter deal with the conducted data collection method, the overall procedure of the data collection, and description of the participating companies in this research.

4.2.1  How to collect the data: Interviews

Selecting the most appropriate method for collecting data would be the first challenge to the novice researchers. A variety of data collection techniques are suggested for the qualitative and quantitative researchers such as questionnaires, survey, observation, interviews and so forth (Saunders et al., 2009; Bryman, 2012; Flick, 2006). The data collection method of interviewing with the research participants is one of the most widely adopted techniques in qualitative researches, such as case studies, narrative researches, the grounded theory method and so forth (Creswell, 2007; Bryman, 2012 Saunders et al., 2009; Yin, 2009; Urquhart, 2013).

An interview is a purposeful conversation between two or more people, which is one of methods to collect narrative data. Generally, it could be divided into three types, which
are structured, unstructured, and semi-structured interviews. The first one, structured interviews, would be utilised for collecting the clear answers from the interviewees. This type is similar to gathering data from written questionnaires, and the noted difference is that an interviewer would have an opportunity to listen to participant’s opinions and to observe his or her reactions during the interviews. The next one, unstructured interviews, would make it possible for an interviewer to collect wide range of fresh opinions and perspectives in terms of the studied research problems. Moreover, this interview technique would not only give an opportunity to a researcher to generate newly emerging questions in terms of the interviewee’s answers, but also serve a chance to the interviewees to freely respond to the questions without any restriction of any predetermined answers (Sanders et al., 2009; Easterby-Smith et al., 2012; Silverman; 2011; Prokesch, 1997). The last type of interview, semi-structured interviews, is a mixture of the above-mentioned two interview methods (Leech, 2002). The interviewer of the semi-structure interview has a series of designed or predetermined questions prior to the interviews. However he or she would have flexibility to add more questions, change some settings, or remove some of the queries during the conversation according to the response of the interviewee (Sanders et al., 2009: Bryman, 2012; Silverman, 2011).

In this research, a number of interviews were taken from the research participants, since the grounded theory method would require fresh and rich data from the research target. According to Charmaz (2006), Corbin and Strauss (2008), and Urquhart (2013), the interview technique is widely adopted data collection technique for the researchers who are utilising the grounded theory method. In order to fulfil this basic canon of the grounded theory and the popularity of its utilisation, the researcher employed semi-structured interviews for collecting data because of its flexibility to make it possible for the research to gather rich and in-depth data during the limited time schedule of this stage. After analysing the collected data from each interview participant, the researcher conducted follow-up interviews with the same interviewees in order to gather in-depth understanding as well as to accomplish the research objectives and aim of the study (Corbin and Strauss, 2008).

Interviews could be taken by various ways nowadays. While the interviews could be conducted by conventional face-to-face interviews on sites, there are a variety of ways to conduct interviews through telephone, emails or video conference calls. According to
Sanders et al. (2009), face-to-face interviews would allow a great deal of interactions between the interviewer and the interviewee which would allow to catch and observe the sensitivity of responses and to encourage the participant in order to respond more actively with regard to the subject. On the other hand, when the researcher collects data using other types of interviews (i.e. email interviews, telephone interviews and so forth), he or she would have more flexibility of gathering data with overcoming the spatial and temporal restrictions (Leech, 2002; Sanders et al., 2009; Silverman, 2011). For instance, a researcher would utilise Skype or other similar forms of video conference calls for data collection, which could not only surmount a geographical barrier, but also offer a similar atmosphere of face-to-face interview. Furthermore, email interviews might offer a pliable condition to the interviewees with considering his or her convenience.

4.2.2 The overview of the data collection process

The ethical issue of the research, especially confidentiality, is one of key matters when the researcher conducted the PhD project (Silverman, 2011; Saunders et al., 2009; Easterby-Smith et al., 2012). In order to prevent from the ethical breach of the research, prior to beginning of each interview, the researcher reassured each participant that the contents of the interview and the findings acquired from the conversation would only be presented in general terms (See Appendix 8). In order to satisfy the confidentiality code of conduct meticulously, the researcher also presented a copy of a letter to each person to explain the purpose of collecting the data and the utilisation of the interview (See Appendix 3 and 4). The contents of each letter included the researcher’s intentions of each interview and the application of the data in accordance with strict confidentiality. Moreover, it was also stressed that the preservation of personal information such as the name of each informant and company name, which would not be used only in the research project.

According to Dey (1999), a researcher who applies the grounded theory method would normally start with a “general subject or problem conceived only in terms of a general disciplinary perspective”. During some of the first set interviews, unstructured interviews were conducted to enhance the researcher’s understanding and narrow down the specific area of the research topic. As more interviews were carried out with the semi-structured format, the researcher could elaborate and sharpen the research questions for better
understandings of knowledge sharing within the organisational members. Normally, it was permitted that the interview participants to speak freely in order to encourage them to provide more fruitful and vital thoughts and information. In addition, the researcher made notes for describing the overall atmosphere, the interviewees’ gestures, and other miscellaneous information during each interview. Such materials would be a potential source of data in the grounded theory method which Glaser (2002) stated that “all is data [...] exactly what is going on in the research scene is the data, whatever the sources, whether interview, observation, documents. It is not just what is being, how it is being and the conditions of it being told, but all the data surrounding what is being told”.

Therefore, these short descriptions of each interview were useful for the researcher to enhance understandings of the interview participants perceptions and reactions towards the interview questions.

Collecting the interview data from the informants was carried out in various places, such as private meeting rooms, lounge rooms of the companies, coffee shops and restaurants. When each interview was conducted, the researcher firstly presented oneself as someone who was a motivated person to learn from the interview participants’ practical knowledge and thoughts. The initial part of each interview dealt with general issues in terms of knowledge management and other relevant activities. The purpose of this procedure was to recognise each interview participant’s extent of understanding and attitudes towards knowledge management and knowledge sharing. Furthermore, it was useful to make the interview participants feel more comfortable, relaxed, and friendly with the interviewer through these initial questions. Then, the questions were asked based on the participants’ experiences and understanding of the topic. Although the orders of asked questions were slightly different from person to person, the overall meanings and contents of the conversations were same as the entire interviews. As the interviews were carried out in this way, the researcher was able to acquire live and real information from their experiences, that is, how they had shared knowledge with others and encouraged the members to take part in knowledge sharing in his or her organisation.

As stated in the previous subsection of the chapter, the main interview strategy of this study was carried out through a semi-structured interview so the pre-determined set of questions were asked at the beginning part of each conversation (See sample interview questions in Appendix 5). These set of questions mainly focused on the present activities
of knowledge management and knowledge sharing in the involved firms as well as the individuals’ point of views with respect to knowledge sharing and knowledge management. The examples of preset of the interview questions in each conversation were;

- What is the interviewee’s understanding and thought of knowledge management and knowledge sharing?
- What are the potential benefits of knowledge management and knowledge sharing in one’s company?
- What is the current state of knowledge management in one’s company?
- What would be the potential barriers and enablers of knowledge sharing?

After carrying out the first part of interview questions, the researcher proceeded the interview as the extent of the participants’ interests and the depth of his or her knowledge with respect to the topic area of this study. This approach would make it possible for the research to enhance the accuracy of resulting the data set, and validity of the data. Moreover, the researcher tried to make the informants feel comfortable and relaxed during the interviews in order to acquire more fresh and practical ideas from their own working experience.

During the interviews, all the conversations were voice recorded with the permission of each person, and the researcher also took some notes, which included the overall atmospheres, the interviewees’ behaviours during the interviews (See Appendix 6). At the end of each interview, the first impression and observation of the interview were summarised in order to prevent from losing the unspoken things such as the interviewees’ behaviours and gestures that seemed important and prominent to the future data analysis. This strategy proved to be useful as a form of verification and validation of the outcomes of each interview. During the data analysis stage, the researcher frequently used these notes to compare new data with old so as to generate additional questions for the subsequent interviews.
4.3 Details of the interviews in the research

In this study, the data were collected between February 2011 and March 2012 from the different participants in different organisations. The interviews were mainly conducted through face-to-face conversation with semi-structured interviews strategy. Furthermore, the subsequent in-depth interviews were carried out if it was required by video conference calls (e.g. Skype), telephone interviews and emails because of the geographical and temporal difficulties.

The total number of interviews conducted in this study was twenty-six from the five companies in Seoul, and Sydney. Although the author intended to conduct the interviews as semi-structured one, the overall style of each interviews occasionally could be described as somewhere between unstructured and semi-structured. Each interview was generally started with providing the brief introduction of the research aim and the reason for conducting the interview. Table 4.1 illustrates the overview of each informant in this research.

<table>
<thead>
<tr>
<th>Company name</th>
<th>Business sector</th>
<th>Project-based management</th>
<th>Location of company</th>
<th>Number of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>ElecCo</td>
<td>Electronic devices manufacturing</td>
<td>Yes</td>
<td>Seoul</td>
<td>6</td>
</tr>
<tr>
<td>FinCo</td>
<td>Financial service and consulting</td>
<td>Yes</td>
<td>Sydney</td>
<td>14</td>
</tr>
<tr>
<td>ConCo 1.</td>
<td>General contractor</td>
<td>Yes</td>
<td>Seoul</td>
<td>2</td>
</tr>
<tr>
<td>ConCo 2</td>
<td>Design and construction management</td>
<td>Yes</td>
<td>Seoul</td>
<td>2</td>
</tr>
<tr>
<td>ConCo 3</td>
<td>Design and structural engineering</td>
<td>Yes</td>
<td>Seoul</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Number of interviews</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

Table 4.1 The overview of the interviews

The first package of interviews were carried out with six participants from one project-based company, which is an electronic devices manufacturing company, in Seoul, South Korea. Each of these interviews carried on between 45 and 80 minutes depending upon
the interviewees’ interests and depth of knowledge in terms of knowledge management and knowledge sharing. Then, the researcher immediately transcribed each piece of them fully first in Korean and then translated directly into English. After the first several interviews, the researcher conducted fourteen interviews with another project-oriented firm, which is a financial service and consulting company, by English and Korean depending upon the participants’ demographic background in Sydney, Australia. The duration of each interviews varied from 35 to 130 minutes depending on the participants’ interests with regard to the research topic. As the transcriptions of each interview were made immediately in the first set of the interviews, the second package of the interviews were also transcribed each of them fully afterwards to assure the accuracy of data analysis. Later, more interviews were conducted in six in Korean in Seoul, South Korea with the different informants from three different companies in the same industry. That is, the number of the interview participants was six from three different companies in the architecture, engineering and construction industry, which includes one general construction contractor, one design and construction management company, and one design and structural engineering firm. Overall, each of these interviews lasted between 90 to 140 minutes in Korean depending upon the personal interest of the topic as well as the depth of knowledge regarding the topic of this study. Each of the interviews were transcribed in Korean and then translated into English afterwards.

As some of the interview participants’ are native Korean speakers, the interviews were conducted in Korean as stated. In this circumstance, translation of initial transcripts would be one of the potential issues in the research (Temple and Young, 2004). Behling and Law (2000) point out that the significance of accurate translation in the research because of the language perspective which picks up the delicate nuance of meanings. In order to prevent from this problem, the written copies of each interview were revised by a bilingual speaker of Korean and English to check the accuracy of translation, and then proofread by a native English speaker prior to analysing the data. Moreover, although all the Korean interviewees could not participate in the interviews using English, they were able to read and write in English. As this reason, the translated versions of transcripts were sent to the interview participants and confirmed the selected vocabularies, which could reflect on each individual’s feelings, intentions and perceptions.
4.4 The interview participants’ profiles

The selection of the participating companies was based on the nature of their operation which was mainly project-based management. The participating companies comply with this basic criterion and operate in different business sectors: an electronic devices manufacturer (ElecCo), a financial service and consulting firm (FinCo), and architecture, engineering and construction industry (ConCo 1, 2 and 3).

In order to ensure representativeness and avoid any preconceived perceptions with respect to the research topic in the interviews, the research participants were selected across the companies. That is, the informants of this study are drawn from dissimilar organisational levels such as strategic, tactical, and operational management (O’Brien and Marakas, 2009). The reason for distinction amongst different management levels was that the researcher intended to reflect on the delicate and differing opinions and perceptions which derived from managerial positions. Besides, different position will lead different decision-making and decision strategies (See Figure 4.1). Accordingly, considering the hierarchical differences in the organisational pyramid would be useful to understand the interviewees’ perceptions derived from level of a company.

In addition, each participant was asked to recommend a number of people, who would potentially satisfy the researcher’s expectations for theoretical sampling at the last step of each interview. After receiving the following interviewee’s information, the researcher
sent an email to him or her requesting participation of this research work. Then, after obtaining permission from the informants, the researcher asked them to send a brief introduction of oneself for ensuring suitability of the potential informants of the research or direct phone calls were given to some of them to verify the appropriateness of the research interview. Most of the research informants were appropriate for offering the information in terms of knowledge management as well as being very active to take part in the interviews. However, although some of them expressed positive responses towards participating in this research project, their working experience was below the level of minimum criterion. In this research, the minimum requirement of the individual’s working experience was more than five years. The reason for requiring the minimum level of working experience was to obtain various and profound understandings regarding knowledge management based on project team experiences. Although the interviews’ profiles were appropriate for this research work, in some cases, the interview participants did not want to contribute and publish their interviews in publicly. As this reason, a small number of respondents were excluded from participation of the research project, even though the data were collected (i.e. This is an ethical issue of conducting a research and the researcher tried to reflect on the research participants’ opinions. Hence, the data were not used in this research.). As a result of this process, the research interviews were conducted with twenty-six participants from five companies in three different industries (See Table 4.2).

<table>
<thead>
<tr>
<th>Company name</th>
<th>Strategic management</th>
<th>Tactical management</th>
<th>Operational management</th>
<th>Total interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>ElecCo</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>5</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>FinCo</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>ConCo 1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>ConCo 2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>ConCo 3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>10</td>
<td>10</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 4.2 Number of the interviewees' level in the company
4.5 Profiles of the participating companies

The data were collected from five companies, which are from three different business sectors including an electronic device manufacturer, a finance and consulting service firm, and three companies in architecture, engineering and construction industry. All the research participated company satisfied the two criteria of this data collection: it should run its business unit’s with a project-based; and they should be knowledge-intensive companies rather than product-based companies. Since the main focus of the PhD research concentrated on ‘project-based organisations’, the former criterion was considered strictly prior to commencing the data collection. Moreover, a knowledge-intensive attribute also robustly reflected, since this research’s main concern was to provide a potentiality of knowledge management within project-based organisations.

![Figure 4.2 Description of strong matrix project organization (PMI, 2009)](image)

The first criterion of selecting sample in this study was the organisational managing form of the companies. In this study, the foremost important assessment factor was whether the company runs its business units as project-based or other formats. All of them run its business unit as mainly project-based teams rather than conventional functional operation systems. Consistent with the typology depicted in PMI (2009), all the participating companies involved in this study had a strong matrix structure (See Figure 4.2) and the unit of analysis in this research was the project team members. For example, architecture, engineering and construction industry is normally categorised into a typical example of project-based organisations. The nature of FinCo in this study also reflects the typical project-based organisations. This firm composes several project teams with various
employees from different divisions and departments to carry out customer-centric and customised financial services. Due to this reason, the firm runs its service based on projects rather than conventional functional management system. In addition, the ElecCo’s research and development centre runs its unit as project-based in order to develop and attain a market leader position. The company explained that the main reason for implementing project-based management is due to fierce and increasing competitions in the recent electronic devices market. In order to lead and maintain the market leader’s position, timely delivery of new products is so important that project-based management for its business unit would be one of the ideal forms to cope with this situation.

In addition, another commonality with the involved companies was that they are regarded as ‘knowledge-intensive firms’. There is no obvious, widely accepted, and agreed definition with respect to knowledge-intensive firm. However, one apparent distinction between ordinary firms and knowledge-intensive firms show that it is different from its efforts and outcomes compared to the conventional firms. Moreover, lots of companies have been transforming their organisations into the new format, that is, knowledge-intensive company. According to Starbuck (1992), labelling and classification of firms represent the company’s input system and resources to the production processes. Besides, labelling of companies also shows the significance of inputted resources. For example, conventional companies, which signify as ‘capital-intensive’ companies, would consider the significant role of capital in its production and process. Similarly, in recent years, companies, which would be labelled as knowledge-intensive companies, may deal with knowledge as the core input resource and production. In this research, five companies engaged in the interviews were categorised into knowledge-intensive company. Hence, the research participated companies of this research project could be classified into knowledge-intensive companies based on this labelling system.

Although the participating companies are based in South Korea and Australia, all the companies run overseas branches in a number of different countries including the UK. The historical backgrounds of the participating companies vary. ElecCo and FinCo were established more than 50 years ago, and ConCo1 has been in existence for more than 50 years in South Korea. On the other hand, two of the companies in architecture, engineering and construction industry (i.e. ConCo2, and ConCo3) were founded less than
25 years ago. The size of the companies also varied from one company to another. The three cases, which are ElecCo, FinCo, and ConCo1, are large-sized enterprises (i.e. the number of employees are more than 251), while the remainders of the list are medium-sized (i.e. the number of employees is more than 51 and less than 250) and small-sized firms (i.e. the number of employees is more than 11 and less than 50). The categorization of small, medium, and large-sized company is based on the European Commission’s ‘The new SME definition: User guide and model declaration’ (European Commission, 2005). The detail of each participating company is explained in the following subsection of this chapter.

4.5.1 ElecCo

ElecCo is one of the global electronic devices manufacturers in South Korea with more than fifty years of history. The company runs its working environment as a multiple project teams in order to develop and launch electronic devices and appliances faster than its competitors. About thirty years ago, top management of the company had been aware the importance of knowledge management. Then, they had started to launch knowledge management in the company and now, they have successfully implemented knowledge management and relevant activities as a holistic approach to the company. Recently, the company has established new knowledge management systems and approaches. For example, one of the examples of knowledge management approaches in this company is called ‘Venture companies in the company’, which promote employees to generate, communicate, and share their good ideas and knowledge as if leading venture companies do in their business. Through these activities, they reassure the significance of knowledge in this era as well as spread its relevant activities in the entire company.

4.5.2 FinCo

FinCo is famous for its unique service of finance and consulting business in the world, and it is one of the leading firms in this industry. Recently, this company has participated in a number of large project finance works in construction and infrastructure investment all around the world. Although FinCo had already recognised the significance of knowledge management and their main product of the company is knowledge-intensive materials, the company has implemented knowledge management systems and relevant
activities more recently. During the collection of data from this company, they tested and discussed lots of knowledge management systems and knowledge sharing activities in order to select the best appropriate option for the company-wide activities. The aim of knowledge management in this company is to share and transfer the employees’ intellectual assets and best practices within the company efficiently and productively. In other words, the company had recognised their mistakes, which led to reinventing the wheel, and now they are trying to alter such mistakes to achieve cost efficiency and to attain the market lead in the financial industry. As this company runs its business units all around the world (e.g. The Asia-Pacific headquarters are located at Sydney, the data centre is in Delhi, and the Europe headquarters are in London), one of the company’s issues in terms of knowledge management is how to share knowledge in effective and efficient ways as well as how to motivate the employees to participate in knowledge sharing and other relevant activities.

4.5.3 ConCo1

ConCo1 is a private sector company and, one of the leading construction and infrastructure development companies, which is categorised into tier 1 construction company in South Korea. The company runs lots of construction sites in South Korea, South East Asia, Middle East Asia, and North Africa. Initially, this company had constructed building and infrastructures in South Korea. Since the early of 1980s, they had expanded its business locations from local to the international areas such as Saudi Arabia, Thailand, Libya and so on. As the company had worked globally, top management felt the need of better communication for sharing good practices and methods all around the construction sites. As a result of this incident, the company had tried to implement knowledge management in the mid of 1990s. Recently, they utilised computer-aided knowledge management systems in order to enhance the ability of knowledge sharing with the globally dispersed construction sites as well as to attain a market-leading position in the construction industry. For example, this company runs its own knowledge repositories and the workers in this company can access and obtain certain knowledge by using their computer and smartphones regardless of temporal and spatial restrictions.
4.5.4 ConCo2
ConCo2 is a private sector company, and its main business is to design and consult construction management in South Korea. This company is a prominent company of construction management in South Korea. It runs several construction sites and works in collaboration with lots of global leading construction companies, which run their business in South Korea. This company runs its own data centre for accumulating vast amounts of documents and drawings relevant to all the construction works which they had accomplished since 1990s. They aimed to establish data centre for easy access of the past works for the future workers, and not to repeat past mistakes during the construction projects. Moreover, as this company has started to work its business in China and other Asian countries in the recent year, they want to efficiently share others knowledge within the company with overcoming the temporal and spatial difficulties. Recently, the main objectives of knowledge management in this company has been shifted from collecting and accumulating data and knowledge to enhancing and improving the ability of sharing knowledge with other members and dispersed construction sites. In addition, the CEO’s commitment in terms of knowledge management has been growing and so this is the reason why the company was interested in knowledge management and knowledge sharing.

4.5.5 ConCo3
ConCo3 is a small-sized structure design company in South Korea. This company has worked in collaboration with major construction companies in South Korea. In the recent year, this company has started to work as a partner company of a major construction company in South Korea, so they gained a permission to access this company’s knowledge management systems for sharing and exchanging the knowledge with other partner companies. Due to the small size of the company, it was difficult for this firm to establish its own knowledge management system. Working as a partner of the major construction firm, they could acquire better know-how, knowledge and information from it as well as this company shares its unique knowledge and information with other partners in the band of the big firm.
4.6 The research data

During the initial analysis of the collected data, variety of emerging concepts was identified. Moreover, the researcher utilised various kinds of the companies’ internal sources of data with the permission of the involved companies. The access of these references would make it possible for the researcher to broaden one’s point of views regarding the studied phenomena as well as to enhance the research findings. For example, it was investigated the companies’ demographic settings, historical backgrounds, their mission statements, and their basic policies and process of decision-making, as relevant to knowledge management and knowledge sharing strategies. These documents offered lots of information about how knowledge sharing strategies are determined and diffused in each company.

4.7 Data analysis procedures

The collected data should be analysed in systematic ways (Sanders et al., 2009; Creswell, 2007). For the researchers who are using the grounded theory method, systematic coding is an essential for analysing and categorising the data for better understanding and generating a new theory. The data analysis of this study divided into two phases: initial data analysis; and main data analysis. In the initial data analysis phase, the general features of knowledge management in the research participated companies were dealt with to understand the overall practices and perceptions regarding knowledge management. After the initial data analysis, the main data analysis which focused on knowledge sharing as the major theme of knowledge management within project-based organisations. The following sections of this chapter describe the overview of the coding processes of this research as well as discuss the generated conceptual model.

4.7.1 The overview of the coding process

The process of coding is the essential stage as well as the starting point of the data analysis in the grounded theory method (Corbin and Strauss, 2008; Charmaz, 2006; Glaser and Strauss, 2009). After the empirical data had been collected, the researcher began the process of coding, which means categorising the data to reflect on the various issues emerged. In this study, the grounded theory method was as a means of developing a theory based on the collected data. For this reason, the researcher employed Corbin and
Strauss’ approach to construct a concept-driven model (Corbin and Strauss, 2008). That is, the overall procedures of coding system followed the system in this study, which was suggested by Corbin and Strauss (2008).

During the coding of the collected data, the researcher used two different ways of coding: manual coding; and coding by computer aided software package (i.e. NVivo 10). In the initial stage of the coding, the researcher used different highlighters and sticky notepads in order to manually code the data. This approach was useful to understand knowledge management and knowledge sharing activities in project-based organisations. As the collected data were growing, the researcher needed more efficient ways to manage the amount of data. In order to cope with this difficulty, the researcher used NVivo 10 to organise and manage the various data sets accumulated from different interview participants (See Appendix 7). This software package allowed the researcher to organise and store the data with a systematic and comprehensive approach to each case and the entire data (Bazeley, 2007; Hutchinson et al., 2010). In consequence, NVivo 10 was a substantial tool for helping the researcher manage time and laborious data analysis work.

The collected data were coded immediately after finishing each interview in order to generate the new interview questions, which would be used in the subsequent interviews. The initial work of coding was proceeded in two stages. Firstly, the researcher made a note of interviewees’ profile, which dealt with a brief description of the participants including the position, demographic information, and working experiences in the company. All of the information would be useful background knowledge to understand and rationalise the research findings. After this procedure, the researcher made a transcript of the interviews and started to read it through as well as to annotate the paragraphs to discover the main point of each section. Then, the researcher started coding to extract concepts from the interviewed data and develop them in terms of their properties and dimensions (Corbin and Strauss, 2008; Charmaz, 2006).

During the labelling and coding of the collected data, each interview was categorised into specific labelling order to use in a specific coding system including the informant’s type of company, the informant’s number and the extract number. For example, in the label ‘ElecCo-INT01-001’, ElecCo means the type of company, the first numbering system INT01 represents the informant number of the set of interviews, and the last three digits
presents the paragraph number 001 of the interview’s transcript. This labelling system enabled the researcher to identify and analyse the informants’ profiles in an accurate and organised manner (Corbin and Strauss, 2008).

Moreover, each paragraph of the interview transcripts was also coded in order to identify and understand the relationship between the codes and the entire context. This approach enabled the researcher to view each concept with more wide perspective. Along with creating and labelling the paragraphs of the data, the researcher began writing memos in order to reflect on my points of view towards them. The codes and memos were the rudiments for analysing data and generating the conceptual model. That is, the researcher constructed a number of concepts that reflected on the researcher’s interpretations and guided to the subsequent concepts for saturating of the data (Corbin and Strauss, 2008; Charmaz, 2006). This iterative process allowed the researcher to realise the contexts and interactions among the actors more thoroughly. In addition, it was useful for the researcher to understand the data, relationships between the concepts and data, and producing the conceptual and practical model of the research.

4.7.2 Constant comparative analysis

Glaser and Strauss (2009) suggest ‘constant comparative analysis’ as one of the significant features for analysing the data in the grounded theory method. The main purpose of constant comparative analysis is to develop a theory around the core variables through systematic approaches. In other words, the theory will be developed, as the researcher constantly conducts and compares theoretical categories during data analysis process. Thus, the constant comparative analysis is one of the core processes of the theory development in the grounded theory method, and it should be conducted until no more new categories and concepts will be emerged (i.e. theoretical saturation) (LaRossa, 2005; Rennie, 2006; Corbin and Strauss, 2008; Urquhart, 2013).

According to Glaser and Strauss (2009), the stages of constant comparative analysis compose of four distinctive procedures: comparing incidents applicable to each category; integrating categories and their properties; delimiting the theory; and developing the theory. During the first stage, comparing incidents applicable to each category, the researcher would code each piece of data into categories. During this stage, the analyst
would compare the incidents with previous ones in the categories. As a result of comparing incidents, theoretical properties of the categories emerge. Based on the emerged categories in the previous stage, the researcher would continue comparing by identifying the important theoretical relationships between the categories. The theory emerges when different categories and the properties would be integrated with each other (Glaser and Strauss, 2009; Corbin and Strauss, 2008). The integrated categories in the second stage would be delimited to create the broader categories in order to construct theory with a smaller set of higher level concepts. This stage is a kind of works for elaborating and connecting the categories in order to generate a substantial level theory based on the similar properties (Corbin and Strauss, 2008). During this stage, the literature would play a role to supply additional comparisons as well as to support the identified categories. The final stage is developing a theory which uses all the relevant materials from the previous stages such as coded data, memos, and concepts. The developed theory is the explanation of the relationships between the categories and the emergent phenomenon in the study.

4.7.3 Initial theme development

The first data analysis of this study was conducted to figure out the interview participants understanding and perceptions in terms of knowledge management as well as to develop the initial theme. It was preliminary work to generate and comprehend the major theme of this research work. Besides, it was designed to recognise the interviewees’ fresh ideas of the research area. This initial theme development process was crucial to provide and comprehend the status quo phenomena of knowledge management in the research participating companies. Based on this initial data analysis, knowledge sharing was the major theme for improving the firm’s performance and attaining competitive advantages. The details of the initial theme development are depicted in the following sections.

4.7.3.1 Perceptions of knowledge management

The first work of each interview was to comprehend the interview participants’ perceptions regarding knowledge management as well as to explore each individual’s definition of knowledge management. The interview participants’ understanding of knowledge management could be categorised into two folds:
• Knowledge management is a communicating method in the firm;
• Knowledge management in itself as sharing information and valuable intellectual assets with others

Majority of the research participants considered that knowledge management is not simply sorting or classifying the intellectual properties into knowledge management systems, but it is a type of communication channel or a method to share ideas, information, and valuable documents with colleagues. They considered that sharing the information, data, knowledge or any types of verbal and physical information is more important than producing or creating new knowledge, and storing it into the company’s knowledge repositories.

Knowledge management is a communicating method

The underlying presumptions amongst the informants were consensus with most of the interview participants regardless of types of industry. Majority of the interviewees responded that knowledge management would be a useful strategy to preserve and utilise the company’s valuable intellectual assets. Most of the studied companies in this research project have used knowledge management systems in order to enhance sharing information and knowledge with other members in the company as well as to avoiding the leakage of their properties outside of the firm. One of the remarkable roles and perceptions of knowledge management was that majority of the respondents’ perceptions regarding knowledge management was consistent with most of the knowledge management literature (i.e. knowledge is one of the strategic assets of the company, knowledge management would prevent from reinventing the wheel and repeating the same mistakes) even though they have not got any materials regarding knowledge management and relevant subjects. An informant in ElecCo described the usefulness of knowledge management in his company as,

“We report all the possible problems, and matters then make a list of them to prevent from the foreseeable risks [...] It would become a very useful tool for us to avoid the previous problems and prevent from reinventing the wheel. Moreover, through this system, such risks and problems will be shared in the same project
team members or anyone who has a right to access our knowledge management system” (ElecCo-INT1)

Besides, most of the informants considered that knowledge management would be a medium to connect predecessors and successors as well as all the colleagues in the company. Normally, it is widely accepted that knowledge is transferred through a variety of interpersonal activities (i.e. personalisation strategy) as well as documents and artefacts (i.e. codification strategy). In reality, physically, it would be difficult to contact the knowers (i.e. knowledge holders) whenever the knowledge seekers want to acquire knowledge from them. However, knowledge management could overcome such barriers and enhance knowledge sharing with colleagues. Moreover, systematically shared knowledge in a firm could connect the past and current members regardless of the temporal restriction. Accordingly, knowledge management is not only a warehouse of information and knowledge produced in the company, but also a conduit to communicate with lots of members in the firm. The informants (a strategic manager) in ConCo2 reflected the significant role of knowledge management and the significance of sharing knowledge with other members in the company.

“Personally speaking, managing knowledge means continuous communication with others. Also, storing and creating the knowledge is important but such activities also require constant contact and sharing ideas with others to classify them. For me, knowledge management and the core of knowledge management is sharing and transferring the generated knowledge within the firm, not outside of the firm.” (ConCo2-INT1)

In addition, an operational manager in ElecCo suggested the role of knowledge management and indicated one example for highlighting its significance in the company.

“For example, this might be an extreme case in a company but I think it could happen in any companies. Sometimes, a duty manager or the knowledge owner is out of the office or retired in a sudden. If the task overtaking or other person knows that knowledge in a team, it would not make any difficulties in there. However, if it hasn’t transferred well, a team would face a difficult situation. In order to prevent from such cases, we need to implement and use knowledge management. And I think the most important process of knowledge management
and the essence of it is sharing, distributing the knowledge within a team or a company.” (ElecCo-INT4)

Knowledge management would be used as information-warehouse that functions as a supportive tool for future or potential users in a company. According to the resource-based view of knowledge management, knowledge is not merely an intellectual asset, but it is considered as a firm’s resources for attaining competitive advantage. An informant (ElecCo-INT3) viewed similarly with this approach.

“In my point of view, the knowledge management system is an essential one. It is for everyone who is working in the company. Knowledge management system is a warehouse which we can seek for any required information. This is one of the resources for a competitive advantage. As we live in the information age, how to manage knowledge and information is very important. And it should be preserved properly.” (ElecCo-INT3)

Knowledge management in itself as sharing with others

Accompanying with the perspective which considered knowledge management as a communication and warehouse of intellectual properties, variety of the informants thought that knowledge management in itself means sharing knowledge. They reflected that the core of knowledge management is not processing knowledge, but sharing the acquired and created knowledge amongst members securely in a company. They showed that properly recirculating the owned knowledge would be a foundation to regenerate and develop new knowledge to sustain competitive advantage and improve a firm’s capability as well as an individual’s ability. A tactical manager in the financial company expressed the significance of knowledge sharing as follows.

“Knowledge management means to set up a database or a place that can be passed down to other people easily, more efficiently, and effective ways. I think the reason for setting up such a database maybe make the employees to share knowledge with others. Knowledge management is sharing knowledge, data, or information with others easily, efficiently, and effectively for more productive results.” (FinCo-INT7)
Another informant (FinCo-INT8) also revealed the importance of knowledge sharing in knowledge management.

“Knowledge management is, I think it composes in two aspects. One strand is to put together what you have already known, past experiences, the pat studies and so on. Another is to make people to know collected one. Two things have to be balanced but I personally think that sharing is more important because through sharing process, we can build up relationships or network. And this new networks will be the potential sources for getting or sharing new knowledge.” (FinCo-INT8)

The crucial role of knowledge sharing in knowledge management was also described by an operational manager in FinCo.

“I guess knowledge management for me basically means having a process, in place to capture what an organization sort of knows. And then to find a way to both make it available but also to share it and encourage sharing between different employees in the same company.” (FinCo-INT6)

4.7.3.2 The potential outcomes of knowledge management

There are various potential outcomes of knowledge management such as enhanced organisational learning, improved performance, avoidance of repetitive mistakes and amnesia, and prevention of reinventing the wheel. In this initial data analysis, the potential consequences of knowledge management could be categorised into two aspects, which are personal level benefits, and organisational level benefits (See Table 4.3). Moreover, the prospective results of harnessing knowledge management is closely related to motivation of knowledge sharing which will be dealt with in the next following section (See 4.7.4.1.3. Motivation).

The personal level benefits category is closely related to an improvement of personal expertise and capabilities which would be the fundamental source of personal competitive advantage against others. For the organisational benefits category, it is intimately relevant to a firm’s performance enhancement and improvement which would be a basis for company-level competitive advantage. As a result of these findings in this research project, one of the fundamental goals for knowledge management is to achieve
competitive advantage and knowledge sharing would be one of the efficient and effective vehicles for accomplish this goal within project-based organisations. In the following section, the details of each category will be discussed.

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<thead>
<tr>
<th>Core category</th>
<th>Categories</th>
<th>Concepts</th>
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<tr>
<td><strong>Competitive</strong></td>
<td><strong>Personal level</strong></td>
<td>Self-satisfaction</td>
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<td>advantage**</td>
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<td>Own convenience</td>
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<td>Improved work processes</td>
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<td>Dissemination of organisational memories</td>
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Table 4.3 The potential outcome of knowledge management

**Personal level benefits**

A large number of the informants suggested that the potential benefits of knowledge sharing are relevant to the personal level. In the interview data, personal level benefits are higher level return from others such as respect, admiration and so forth rather than lower level compensation such as bonus, and monetary reimbursement. Self-satisfaction is one of the potential gains from sharing knowledge which would be a way of exhibiting his or her competence to others. It is an emotion that the knowledge contributor feels like that he or she is acknowledged as an expert or specialist in a certain area by the knowledge seekers. In other words, being recognized as a knowledgeable person means that the knowledge givers may feel that he or she is a talented or experienced person as well as possessing sufficient knowledge. A tactical manager in FinCo expressed that knowledge sharing is showing his expertise and capability to others.

“It (knowledge sharing) is a way of showing my professionalism to others.”  
(FinCo-INT1)

In addition, knowledge sharing would produce an improved work process accumulating with other employees’ knowledge, opinions and experience. In order to produce new ideas and knowledge, it is inevitable for a company to share and disseminate existing
knowledge to other members. An operational manager (FinCo-INT13) showed his thought regarding knowledge sharing as,

“We can make a new process or to build up much stronger and high quality of internal workflow which is pretty much better than now by spreading and accumulating all the ideas in the company. Without reflecting on the past works, and misbehaviours, we cannot achieve the advance.” (FinCo-INT13)

There was a fresh perception regarding the potential benefit of knowledge sharing in a project team. One interviewee expressed that she could retrieve already-known information or knowledge in a situation where she could not remember the shared knowledge or information. She regarded the knowledge receivers’ as her knowledge warehouse or repository. Most of the interview participants considered that sharing knowledge would be useful to recipient and the knowledge owner would acquire fame and esteem in return. However, through sharing one’s information and knowledge with others, it would be circulated with others in the company and lots of employees could use that knowledge without loss or annihilation of valuable intellectual assets. The interviewee, FinCo-INT2, showed this idea as follows.

“I share my knowledge for my own convenience rather than for the company. For me, I used to share, and am sharing knowledge with colleagues in my team because through knowledge sharing, the knowledge keep circulated in our team and some of them might remember it even though I can’t remember it when I really need it.” (FinCo-INT2)

Organisational level benefits
Potentially, harnessing knowledge management would bring a project team level’s benefits. Knowledge management would be beneficial not only to the individual members, but also to the entire organisation. A number of the informants stressed the organisational level benefits from knowledge management. A large portion of them indicated that one of the major reasons for adopting project-based management is to satisfy customers’ requirements. They showed that one very satisfied customer would become a long-term partner with a company and thus, properly managed and shared the customer information would be useful to the future project teams and other colleagues in
the company. An operational manager in FinCo explained the importance of customer relationship with a project team as well as the significance of appropriately managed and shared knowledge with project team members.

“Most of our project team deals with clients who have a long-run relationship with us. They chose us because customers are satisfied with our service and our deliverables. [...] Each company has to understand its customers who are the source of our benefits. Understanding the customers and sharing this information with others would produce more positive results in my company. No one can succeed in such customer-centric projects without the proper analysis of its customers. Moreover, to share analysed information with the team members may be number one task.” (FinCo-INT13)

Another interviewee in ElecCo also exhibited the role of knowledge management as a means of reflecting the customer satisfaction as follows.

“We don’t have enough time to start all the project from bottom. But we have stored all the project information and knowledge in our system. And we will modify and apply similar ones to meet the customers’ requirements.” (ElecCo-INT3)

Such customer satisfaction was a prevailed potential result from almost all the participating companies. An informant in ConCo1 showed the usefulness of the company’s knowledge management system.

“One of the important reasons for us running knowledge management system is to transfer the customers’ information to our colleagues and other teams. Especially, it is very useful to deal with after-sale team, especially repair works of apartments. We made a standard manual and will be able to fix problems one by one based on the manual.” (ConCo1-INT1)

Another potential benefit to the organisation is the improved work process. Sharing and circulating ideas and knowledge amongst the members will produce improved and advanced work processes and methods. These improvements would be beneficial not only to the individual member of a project but also the entire company and other project
teams in the same organisation. A tactical manager showed the significant role of improved work processes from knowledge management.

“I think that a company is an organism. It can learn and alter its misbehaviours and malfunctions with reflection of past behaviours and mistakes. In order for a company to learn, education is very important. But educating the employees without considering their problem will become worse than leaving itself. This means, employees’ feedback and gathering the information from them will be very important. And knowledge management system is a fundamental basis to gather and analyse their needs and difficulties.” (FinCo-INT6)

In addition, the interviewee, FinCo-INT13, stated the role of knowledge management as a tool to improve the company’s work process.

“My company is different from self-owned small shops in high street. In this building, hundreds and thousands of employees are working now and I don’t know all of them. In order to disseminate good or bad cases relevant to our works, knowledge management system is perfect one. Simply, logging in and clicking the tap, and we can see how all the company-wide works and I can search for what I need and download it. It’s perfect system to spread out organisational memories and lessons learned.” (FinCo-INT13)

As the above informant showed the potential benefit, one of the interviewees in the construction industry also maintained knowledge management as a tool for improvement of work processes and activities.

“In a construction site, there are a lot of unpredictable events and happenings. For some of the difficulties, predecessors have already contacted the problems and the knowledge system contains how to manage it. However, for new one, we should deal with by ourselves and will upload our way of coping with it. Such constant updating and inputting new information will make it better and it’s one of the greatest benefits from knowledge management.” (ConCo1-INT1)
4.7.4 **The main theme development**

The main data analysis was conducted after generating the major theme of this research work. In the previous section, knowledge sharing was established as the essential process of knowledge management in the studied project-based organisations. Moreover, the interview participants implied that the prospective outcomes of knowledge management are personal, and organisational performance improvement which are closely linked to competitive advantage. Accompanying with the major theme, the main data analysis was carried out to explore how to improve and enhance knowledge sharing within project-based organisations.

4.7.4.1 **The conceptual model**

Based on the initial theme development stage, the researcher generated more of an abstract level of the conceptual model of the study. The researcher discovered that the most essential process of knowledge management in the project-based organisations is knowledge sharing between the members. In order to develop the relationships between the constructs which are connections among core categories, categories, and concepts, as well as to generate the conceptual model, knowledge sharing was selected as a major theme of this study. Lots of interview participants agreed that knowledge sharing would be one of the potential vehicles for achieving sustainable competitive advantages as well as enhanced the level of performance in the project-based organisations. Due to these reasons, the researcher determined knowledge sharing as the major theme and developed the conceptual model which is the relationship between categories and concepts (See Figure 4.3).

![Figure 4.3 The conceptual model](image_url)
The generated conceptual model is, ‘Knowledge sharing as the core process of knowledge management in the project-based organisations’, which was derived from the various levels of the concepts and constructs. The conceptual model is the result of integration of four core categories: trust, relationship, motivation, and self-efficacy (see Figure 4.3).

Each core category composes of categories which are grouped with similar concepts and shared properties. The trust core category contains four categories: securing, sharing, affiliation, and supporting; the relationship core category has three categories: linking, understanding, and membership; the motivation as one of core categories includes three categories: workload, culture, and remunerating; and the last core category self-efficacy encompasses three categories: modelling, experiencing and being persuaded. Table 4.4 shows the details of core categories and categories in this study. The Figure 4.4 shows the relationship amongst the core categories. Moreover, each category has a number of different concepts, which were grouped together with the similarities of properties and dimensions (Corbin and Strauss, 2008; Charmaz, 2006). In the next section of this
chapter, each core category of the study is explained briefly and the further details of each concept are dealt with in Chapter 5 data analysis.

Figure 4.4 The detail of conceptual model

4.7.4.1.1 Trust

It was found that trust is the most significant construct in the conceptual model during the coding procedure. The trust core category composes of four categories: securing, sharing, affiliation, and supporting. The securing category has five concepts and the sharing category composes of two concepts. In addition, the remaining two categories, which are the affiliation, and supporting, consist of four and three concepts respectively. The detail of each category of trust is depicted in Table 4.5.

The interpersonal or mutual trust between the members within the project team is one of the most crucial matters in order for the individual members to determine whether to share knowledge with others. It was found that trust is the fundamental of creating the
personal relationship with others for sharing knowledge in the project-based organisations. Moreover, trust has a significant role to motivate the members to engage in knowledge sharing with the members in the project team. That is, the more trustworthiness, the more tendency to take part in sharing knowledge with others. In addition, self-efficacy for enhanced knowledge sharing is also affected by the extent of trust between the members. Thus, it was implied that trust should be cultivated amongst the project members in order to promote knowledge sharing within the project-oriented organisations.

<table>
<thead>
<tr>
<th>Core category</th>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>Securing</td>
<td>Stability of the position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not using my knowledge other purposes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good quality of shared knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free-riders</td>
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<tr>
<td></td>
<td></td>
<td>Reducing the competition</td>
</tr>
<tr>
<td></td>
<td>Sharing</td>
<td>Vision sharing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clarifying the sources</td>
</tr>
<tr>
<td></td>
<td>Affiliation</td>
<td>Communicating with others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reciprocity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benevolence to others</td>
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<tr>
<td></td>
<td></td>
<td>Proximity with others</td>
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<tr>
<td></td>
<td>Supporting</td>
<td>Management commitment</td>
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<tr>
<td></td>
<td></td>
<td>Continuity</td>
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<tr>
<td></td>
<td></td>
<td>Technology</td>
</tr>
</tbody>
</table>

Table 4.5 The core category of Trust

4.7.4.1.2 Relationship

Relationship is another core category of the conceptual model of this study. This core category has three categories: linking, understanding, and membership. The linking and understanding category includes two concepts respectively. The remaining category, membership, composes of three concepts (See Table 4.6).

The core category relationship is secondly the influencing element for enhanced knowledge sharing between the members in the project-based organisations. According to the research informants, knowledge sharing which is based on the positive relationship with the members in the team would lead to more fruitful outcomes, which include the positive result of the project as well as the quality of knowledge and the frequency of
knowledge sharing behaviours. Moreover, the relationship is significantly influenced by the interpersonal trust between the members in the team. Such constructive and affirmative relationship would affect not only each member’s intention to engage in knowledge sharing (i.e. potentially influence on one’s motivation) but also the one’s belief that would be useful to improve personal abilities and expertise with participating in it (i.e. probable influencer of self-efficacy). Moreover, the concrete relationship would also intensify the mutual or interpersonal trust for knowledge sharing in the project-based organisations. Hence, it could be implied that relationships between the project team members would be affected by the interpersonal trust, and relationships would potentially influence on other members’ motivation and the degree of self-efficacy.

<table>
<thead>
<tr>
<th>Core category</th>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship</td>
<td>Linking</td>
<td>Meeting the members in various ways</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapport building</td>
</tr>
<tr>
<td></td>
<td>Understanding</td>
<td>Shifting the role or rotating the job</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontality rather verticality</td>
</tr>
<tr>
<td></td>
<td>Membership</td>
<td>Recruiting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategic alliance</td>
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<td></td>
<td></td>
<td>Human resource management</td>
</tr>
</tbody>
</table>

Table 4.6 The core category of Relationship

4.7.4.1.3 Motivation

Motivation is one of the core categories of the conceptual model of this study. It is the combination of three categories: workload, culture, and remunerating. The workload category contains three concepts and the culture category includes five concepts. The last category remunerating encompasses two concepts (See Table 4.7).

Motivation is one of the most effective and direct approaches for the members to take part in knowledge sharing in the project-based organisations. The research informants suggested that people’s behaviours would yield different outcomes from the motivated personnel and not motivated ones. While a number of motivators and de-motivators were suggested by lots of researchers (Ardichvili, 2008; Ardichvili et al., 2003; Bartol and Srivastava, 2002; Bock et al., 2005; Gagné, 2009; Hendricks, 1999; Milne, 2007; Osterloh and Frey, 2000), the researcher grouped the potential motivating factors into three categories which were reflected on the most influential and essential features and
properties of this study. In this research, motivation would influence the members’ self-efficacy of knowledge sharing. That is, well-motivated staff in the project team has a more positive tendency to engage in knowledge sharing as well as more confident on knowledge sharing without any hesitance or reluctance to engage in it. Moreover, the positive relationship with others would have a significant impact on the other members’ behaviours of knowledge sharing. Furthermore, well-motivated members in the team would intensify trust for sharing knowledge between the project members. Accordingly, it would be suggested that motivation is one of crucial core elements of enhancing knowledge sharing in the project-based organisations.

<table>
<thead>
<tr>
<th>Core category</th>
<th>Category</th>
<th>Concepts</th>
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</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Workload</td>
<td>Overcoming the task inundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Integration with the individuals’ tasks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Changing the individuals’ perceptions</td>
</tr>
<tr>
<td></td>
<td>Culture</td>
<td>Tolerating failures and challenges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Willingness to new comers and novices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accepting the diversity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fostering the less competitive atmosphere</td>
</tr>
<tr>
<td></td>
<td>Remuneration</td>
<td>Physical remuneration</td>
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<tr>
<td></td>
<td></td>
<td>Psychological remuneration</td>
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</tbody>
</table>

4.7.4.1.4 Self-efficacy

The last core category of this study is self-efficacy, which means one’s belief or faith to carry out certain tasks. This core category consists of three categories: modelling, experiencing, and being persuaded. Each of the categories has three, two, and one concept respectively. The modelling category includes the concepts of professionalism, becoming an example to others, and being proud of oneself. The category experiencing encompasses with adopting, and personal experiences as the concepts of it. Lastly, being persuaded has only one concept, which is encouraged. The summary of self-efficacy core category is described in Table 4.8.

<table>
<thead>
<tr>
<th>Core category</th>
<th>Category</th>
<th>Concepts</th>
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</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Workload</td>
<td>Overcoming the task inundation</td>
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<td></td>
<td></td>
<td>Integration with the individuals’ tasks</td>
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<td></td>
<td></td>
<td>Changing the individuals’ perceptions</td>
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<tr>
<td></td>
<td>Culture</td>
<td>Tolerating failures and challenges</td>
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<td></td>
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<td>Free communication</td>
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<td></td>
<td></td>
<td>Willingness to new comers and novices</td>
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<tr>
<td></td>
<td></td>
<td>Accepting the diversity</td>
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<tr>
<td></td>
<td></td>
<td>Fostering the less competitive atmosphere</td>
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<tr>
<td></td>
<td>Remuneration</td>
<td>Physical remuneration</td>
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<td></td>
<td></td>
<td>Psychological remuneration</td>
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</tbody>
</table>

Table 4.7 The core category of Motivation

It is important for the individuals to be confident in conducting certain target behaviours in the organisations. The research informants suggested that knowledge sharing would be enhanced when the members in the team are confident of themselves and their
knowledge. Such self-efficacy is the fundamental of starting knowledge sharing with others as well as the basis of attaining sustainable competitive advantage in the project-oriented organisations. According to the research informants, while self-efficacy is one of the crucial factors to intensify knowledge sharing, self-efficacy itself could be enhanced by the interpersonal trust, concrete relationships with the members, and well-motivated personnel in the team. In addition, the person who has strong self-efficacy would be more confident in their knowledge and such confidence could impact upon one’s trust of knowledge sharing as well as potentially influence on motivating the staff in the project team. As a result, self-efficacy would be a potential enhancing factor of knowledge sharing in the project-organisations as closely interacting with other core categories of this study.

<table>
<thead>
<tr>
<th>Core category</th>
<th>Category</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>Modelling</td>
<td>Self-confidence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Becoming an example to others</td>
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<tr>
<td></td>
<td></td>
<td>Being proud of oneself</td>
</tr>
<tr>
<td></td>
<td>Experiencing</td>
<td>Adopting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal experiences</td>
</tr>
<tr>
<td></td>
<td>Being persuaded</td>
<td>Encouraged</td>
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</tbody>
</table>

Table 4.8 The core category of Self-efficacy

4.8 **Summary**

This chapter has presented the data collection method and the overview of coding procedures of this study. It includes a description of the main interviews’ sites and an explanation of the conducted interviews in the second and third year of the PhD study. In addition, this chapter describes the constructed conceptual model and each of the categories in this model.

The five companies from three different industries, which run their business units based on project teams were selected for collecting the substantial data. The total number of interview participants was twenty-six. In order to fulfil the basic dogma of the selected research methodology, the semi-structured interview was chosen for the main data collection approach of this study. This strategy would make the researcher gather in-
depth data to understand the research subject and satisfy with the research aim and objectives (Corbin and Strauss, 2008; Annells, 1997; Charmaz, 2006; Glaser, 1992).

In this research, the analysis of data was followed Corbin and Strauss’ approaches of the grounded theory method (Corbin and Strauss, 2008). While a number of grounded theorists suggest various terminologies in terms of the research methods, the researcher adopted Corbin and Strauss one in order to prevent from future confusions and other problems. The overall coding procedures of this study were described in this chapter and the suggested conceptual model of this study also explained. The main theme was ‘Knowledge sharing as the core process of knowledge management in the project-based organisations’. In order to support the main theme of this study, four core categories, which are trust, relationship, motivation, and self-efficacy, were discovered. Moreover, each core category composes of categories, which encompasses a number of concepts. The suggested conceptual model was the basis of further data analysis in the following chapter. Based on the data collection and coding procedures, further analysis of the collected data shows in the following chapter 5.
Chapter 5  
Data analysis

5.1 Introduction

In this chapter, an analysis of the data collected from the five participating companies is presented. The overall purpose of this chapter is to provide explanations for findings of the research project. This chapter explains how each category is related to the core category and how each of the categories influences to the constructed conceptual model. The developed theme model has four core categories; trust, relationship, motivation, and self-efficacy. Each of the core categories is explained in the following chapter; firstly the core category of trust is explained, followed by relationship, then motivation, and finally self-efficacy are presented respectively. Moreover, the analysis of data across all of the cases is conducted in order to identify similarities and differences knowledge sharing across the research participating companies. By identifying these similarities and differences, further insights into the employees’ knowledge sharing behaviours of each case would be gained. Lastly, the relationships between the concepts of the conceptual model are also explained. To conclude, a brief summary of the data analysis and conclusions of this chapter are showed.

5.2 The trust core category

This core category has four categories: securing, sharing, affiliating, and supporting. Each of their concepts is explained in the following subsections. The research informants stressed that the trust between the members in the project team is one of the most significant factor to determine to share one’s knowledge to others. Besides, it was analysed that the trust would affect other factors. For example, trust is the fundamental of building the relationship with others for sharing knowledge. Each of their concepts in the categories is presented in the following section.

5.2.1 The securing category

There are five concepts in this category: stability of the position, not using one’s knowledge other purposes, good quality of knowledge is shared between the members, no free-riders, and reducing competition. In order to cultivate trust between the members in the project team, the research informants suggested that the guaranteed security of
one’s position would be the starting point of building up the trust. The following section of this chapter deals with the details of each concept of this securing category.

5.2.1.1 Stability of the position

It is commonly accepted that job security is one of main concerns regardless of the business sector in the recent economic situation. Job security is one of the major issues that would play an essential role in sharing of knowledge in the project-based organisations. Lots of informants asserted that the first impression of knowledge sharing would mean to offer one’s genuine or unique ideas, information, or knowledge to others and as a result they would lose competitiveness.

Majority of the research informants agreed that the significance and necessity of knowledge sharing within the project environment on general principles. They indicated that exchanging or sharing knowledge would make it possible to prevent from reinventing the wheel as well as to facilitate the exchange of human and physical resources in the project team. Despite these advantages of sharing knowledge, lots of informants were worried about their job position and security because they felt that giving or offering one’s valuable intellectual assets resulted in a loss of their competitive advantages. They also asserted that the unique or heterogeneous knowledge, or information is one of the strategic weapons to survive in this era when the information and knowledge are the power. However, if the company guarantees one’s role or position, they would be willing to share their knowledge which might be the fundamental resource of intellectual assets. For example, one of the operating managers in the financial company (FinCo-INT3) explained this situation as,

“I agree with the basic concept of knowledge sharing, information sharing, and knowledge management, one hundred per cent. I am also thinking that I should, one must do share my knowledge with others in the team. However, when I think it over on a realistic perspective, the story is quite different. We are living in the information age and this information is the power of success. More information, or more knowledge is a weapon to survive in this era. If all the members had the same knowledge as I have, I mean, she knows, he knows, everyone in the team or the entire company knows something, the management would sack one of us. Under this unstable situation, keeping the knowledge, that is, not sharing my
knowledge would be a very efficient way to protect me from being fired.” (FinCo-INT3)

Another middle level project manager in the financial company (FinCo-INT11) also presented his opinion in relation to job security in sharing knowledge with the similar vein as follows,

“A lot of people think that sharing is losing their job in the future. Employees don’t want to lose not only their job but also their competitive advantage. If the company promises, or guarantee me the security of my position, my tenure, I will do that.” (FinCo-INT11)

Moreover, the informant ElecCo-INT5, who is a tactical manager at the research and development project in electronic engineering business expressed that,

“My opinion regarding knowledge sharing is that, I am employed by this company and they pay my salary for and in return I am generating and creating new knowledge. I am currently participating lots of research and development projects as a member of the team. I have also generated vast of knowledge for the company. However, as I am getting older and the company thinks that I am not as creative and helpful anymore, and then I could lose my job from the company. Hence, I can’t trust my company and I won’t sacrifice myself to share the knowledge. Unlike in our generation, I think one of the important reasons why our fathers were devoted themselves to their companies and sacrificed themselves was the guaranteed retirement and their tenure. It shows the trust from the company and it could be one of very effective catalysts in motivating the employees to search certain targets or aims. However, these days, we can’t foresee the future and I can get sacked tomorrow without knowing the reason. Hence, my point is the security of my job would be a very very important element of knowledge sharing and any other activities” (ElecCo-INT5)

Thus, they implied that the security of the job position would be the basis of building trust between the employer and employees to enhance knowledge sharing in the project-based organisations.
5.2.1.2 Not using my knowledge other purposes

‘Not using one’s knowledge to other purposes’ is one of the key concerns which would build up trust between the members in the project-based organisations.

Majority of the interview participants revealed that one of the main reasons of sharing knowledge in their company was a benevolent and altruistic purpose. The interview participants pointed out that sharing knowledge in this way would become the basis of spontaneous participation of knowledge sharing. In addition, this kind of knowledge sharing is based on mutual trust, which the knowledge seekers believe that the knowledge holder knows certain knowledge, and he or she will help him or her to offer the required knowledge. As a result of this kind of reciprocal beliefs, knowledge sharing would take place between the two parties. Furthermore, the knowledge donor may think that the shared knowledge in this process would be utilised only for resolving problems or work-related purposes. However, some of the informants pointed out that while most of the members would use the received knowledge for such good purposes, some of them might exploit it for one’s own sake. They indicated that such exploitation or misuse of the donor’s virtuous would make it difficult to build up trust in knowledge sharing. Thus, they implied that the members’ belief of fair use of shared knowledge would be one of the significant elements to enhance knowledge sharing in the project-based organisations. For example, the informant FinCo-INT10 who is responsible for operational manager in financial company showed his opinion in terms of the misuse of shared knowledge as,

“Most of the cases, when I offer my data, information or knowledge spontaneously to others, I would probably expect that the knowledge receiver should use it only for the purpose of problem solving or public good. That is, for example, if he or she will use the obtained knowledge for writing his proposal or something similar like, it is a breach of my condition to share the knowledge to them. Such exploitation would make it difficult for team members to share knowledge.” (FinCo-INT10)

The informant ElecCo-INT3 who is the director in electronic company suggested a popular example of misuse;
“One of the common knowledge misuses in my team may be, the receiver didn’t mention about the knowledge sources. Developing new products may be similar to writing a thesis. We need a lot of references and the users have to make the sources clear and obvious.” (ElecCo-INT3)

The tactical manager of financial company (FinCo-INT7) also stated the importance of indicating the knowledge and information sources as,

“When our team has a meeting, most of the team members inform the source of the shared or gathered knowledge, where they mined it or who gave it to him or her. In some cases, I obviously knew certain ideas or information belonged to others. However, the presenter didn’t announce and indicate the source of the information. When I see this situation, such circumstance make it difficult for me to share or to offer knowledge to others because there would be a possibility of improper use or exploitation of my unique knowledge” (FinCo-INT7)

5.2.1.3 Good quality of shared knowledge

The quality of shared knowledge is another major consideration of trust that would play a significant role in enhancing knowledge sharing in the project-based organisations.

The interview participants emphasised that one of the prerequisites of increased utilisation of knowledge management or knowledge sharing would be the quality of knowledge in the system. They underlined that the contents of the knowledge systems would be one of the crucial determinants for the employees’ decision of participation. For instance, one of the informants who is in charge of tactical manager in the construction project (ConCo1-INT1) stated that,

“In order to make the employees use the company’s knowledge system more actively, the contents in the knowledge system has to be more fruitful and discerned with other information sources. If we can’t see any difference between the system and the Internet, we tend to use or prefer to use the Internet because it’s much familiar. However, if the contents of the company’s knowledge system is much fruitful and unique, and it fulfils the employees’ needs, I would then use this system.” (ConCo1-INT1)
Another tactical manager in research and development project in the electronic company (ElecCo-INT5) expressed similar point of view as,

“At the moment, the utilised knowledge system of our company has one of the mandates. So the quality and the contents of knowledge in it are quite insufficient as well as different from one to one. When I have a look through the pages, I feel like that some of the people just ‘copy and paste certain information from the Internet’. Such action makes me moving away from the company system. I think it’s much better using the Internet explorer to discover what I want to know.” (ElecCo-INT5)

Moreover, they stressed that good quality of knowledge should be assessed by all members of the project team, based on their project goals, visions and the nature of projects. For example, the informant FinCo-INT9 who is an operational manager in the financial project team demonstrated that,

“We are living in the information overloaded era. The company’s knowledge system should be different from the information or rumours in the cyber space. Discerning from rubbish and pearl should be user’s own task to do but the company’s knowledge system has to equip the appropriate information which reflects on the users’ requirements, company’s vision, mission and objectives etc. The shared knowledge in the intranet has to be qualified and meet the minimum level of the user’s requirements.” (FinCo-INT9)

The director of the construction management company (ConCo2-INT1) pointed out the importance of classification of knowledge for preferable knowledge sharing.

“Since our company was established in the 1970s, we have accumulated vast amount of documents relevant to our construction projects. While previously, all the documents were stacked as files and papers, we recently installed on electronic document system for effective and efficient way of managing documents. These documents are the basis of our knowledge and they are very good references or examples to settle present problems. Despite such good points, it takes too much time to find the information which is relevant to the ongoing projects. The company just gathered all the documents without considering its value and its necessity. There are lots of duplicated points and some of them are
really low quality of information. I think regular updates and classifications of such documents and the system should be conducted for the better and more active participation of utilising knowledge sharing.” (ConCo-INT1)

Another senior project manager in the research and development project (ElecCo-INT1) underlined that the quality of knowledge would be one of important elements for the users decision to use the company’s knowledge management systems to share and exchange.

“Owing to the evolvement of technology, especially information and communication technology, we can access all the information we need easily, faster and more accessible. If the information that is shared in the team or the company is not managed and sorted by our team members or our company members, we wouldn’t be able to recognise any differences between the knowledge and rumours in the tabloids. If the quality of knowledge in our own system meets the certain level or the users’ preferences, it would be used more vigorously by us.” (ElecCo-INT1)

Hence, the research informants implied that in order to enhance sharing knowledge between the members in the project team, the company should classify and distil the knowledge based on the purpose, visions, objectives, relevance and applicability. The qualified or discerned knowledge would make it possible for the employees to consider the knowledge system and the shared knowledge in it are reliable and beneficial to their works.

5.2.1.4 Free-riders

A definition of ‘Free-riders’ is anyone who takes advantage of the shared knowledge without any endeavour or sharing one’s knowledge in order to take one’s favourism. The interview participants’ opinions show that the existence of free-riders would deteriorate the members’ decision to participate in knowledge sharing as well as dilute the knowledge contributors’ good will and intention. This negative atmosphere in a project team might also make an adverse team climate, which would directly influence members’ behaviours.
As these reasons, overcoming the issue of free-riders is one of the major concerns for the project members to encourage knowledge sharing in their teams. Moreover, lots of the interview participants pointed out that the concern of ‘free-riders’ is not a simple matter of sharing knowledge or sacrificing oneself but to closely relate to the trust between the members or the entire organisation. Particularly, free-riders would be one of the main reasons to undermine the employees’ good will to share as well as to abandon to offer one’s knowledge in the worst case. Hence, they suggested that in order to enhance knowledge sharing in the project-based organisations, resolving the matter of free-riders would be one of the major concerns to build up trust for knowledge sharing. For example, the operational manager of financial project team in the financial company (FinCo-INT9) expressed her antipathy toward free-riders as,

“*If a member from another team tries to imitate our knowledge or our exclusive ideas, and they sneak into our team to grasp it, I would be unhappy and upset because they got it without any endeavour. Sometimes, I think knowledge sharing is a little similar to this. This makes me move away from sharing knowledge. It is a very big barrier to knowledge sharing. When it comes to knowledge sharing, would it be much better if free-riders disappeared?*” (FinCo-INT9)

Another operational manger in the same company (FinCo-INT3) expressed a similar point of view regarding the hostile attitude towards free-riders,

“*There is someone who is always taking for their own benefit without giving any things in return. If this behaviour is pervasive in the entire company, how dare we encourage the members to participate in knowledge sharing? AS for me, I wouldn’t. If such shameless people disappear from the company, I think, knowledge sharing would be much easier and much better than now. For management, it would be much easier to convince the employees to take part in and share knowledge with colleagues.*” (FinCo-INT3)

Moreover, this perception (i.e. prevailing of free-riders and adversity towards it) was also evident in the same company regardless of hierarchical level. In other words, operational managers and tactical managers in the same firm provided almost corresponding responses. The informant FinCo-INT2 who is in charge of senior project manager in the financial company demonstrated that,
“As people normally tend to be self-centric to some extent, mine is much more precious than others. I think most of the people in the company may try to obtain what they need rather than sharing or giving their valuables. It would be impossible to get rid of such individuals completely but it may be possible to reduce this tendency to some extent. That will be one of recommendable ways to increase knowledge sharing.” (FinCo-INT2)

The antipathy towards free-riders is considered as a common phenomenon across all the participating companies (See 5.6 Cross-case analysis). The senior project manager at the research and development projects in the electronic industry (ElecCo-INT1) also presented his hostility towards free-riders of knowledge sharing.

“I don’t think that there is anybody who takes advantage of the shared knowledge for one’s own sake. However, in my project team, lots of members have been working with each other for a long time and for this reason I hope that they will share ideas and information freely to each other. The basis of knowledge sharing is mutual trust that is reciprocal thinking and behaviours. That is, if I offer my information, then you would give something back for the advancement of our team. This is a very basic rule of information sharing in the team.” (ElecCo-INT1)

5.2.1.5 Reducing the competition

‘Reducing the competition’ is one of the meaningful elements of the ‘securing’ aspect of trust that would play an essential role to enhance knowledge sharing in the project-based organisations.

The research informants agreed with the importance of knowledge sharing in project-based organisations, such as attaining sustainable competitive advantage, improving the firm’s performance level, an effective method for training and educating the employees, and pursuing the innovation. However, some of the interviewees stated that it would be difficult for the individual members to recognise the direct benefits from knowledge sharing, since majority of the advantages from knowledge management and knowledge sharing are for the organisational level ones. In the modern economic situation, owing to the unstable job status and harsh competition, it may be difficult to share one’s
knowledge with others, as knowledge is the power source for securing one’s competitiveness. They indicated that reducing competition inside the team or the company would be one of the potential facilitators of knowledge sharing. As a result, they suggested that the managerial devotion to alleviate the competition in the inner circle would be one of the potential factors to supplement securing of one’s perception for building trust between the members in the project teams. For instance, one of the informants FinCo-INT2 who is a senior tactical manager in the financial company depicted that,

“It is an obvious fact that competition against others in the company is inevitable. I agree that competition has an important factor for achieving massive developments in the modern society. But, when it comes to competition in knowledge sharing, the story would be quite different from the perspective of development. Basically, knowledge in our society means the power or competitiveness. And I think for most people, sharing knowledge means giving up one’s edge or losing one’s advantage. How to combine them together (competition and sharing) would be one of big agonies for management. From the employees’ point of view, reduced or lessened competition will make them feel comfortable to share knowledge. That is, the overall climate of the team is cooperation or collaboration may be one of the ways for the employees to engage in knowledge sharing. It is inevitable to compete with each other, but the competition under the collaborative culture or cooperative atmosphere would be a potential facilitating factor to share knowledge with others.” (FinCo-INT2)

The operational manager in the same financial company (FinCo-INT3) also stated her worry about competition in knowledge sharing as,

“For me, I have gathered all my knowledge since I started my career. And it is really precious for me to preserve my job position and to compete with others. But if someone came to me and asked me to share my knowledge without any endeavour or any return from the others? I couldn’t accept this situation. As you know, the recent economic situation makes us quite exclusive to keep our knowledge. And under this situation, how could somebody possibly dare to ask another to share his or her information and knowledge to increase their own performance and capability? In the severe competitive atmosphere, I wouldn't like to share my information with others.” (FinCo-INT3)
In addition, another operational manager in the financial company (FinCo-INT13) also stated the importance of reduced competition in the team.

“One of the toughest things of working in a company is a very fierce competitive environment. I think your other interviewees who are salary men may feel the same. If the company agrees with us that the company would secure my position regardless of me sharing knowledge, I would definitely participate in knowledge sharing. Security of job, salary, tenure and so on, are very very important elements for the employees of the companies and they may be very important determinants to engage in knowledge sharing” (FinCo-INT13)

5.2.2 The sharing category

There are two concepts in this category: sharing visions, and clarifying the source. The research informants pointed out that knowledge sharing is not merely sharing information and knowledge but the members should exchange the far higher values such as missions, visions, objectives, aims and so forth. The following section of this sub-chapter explains each concept of this category.

5.2.2.1 Vision sharing

‘Sharing similar visions and working with them’ is one of the main elements of the sharing aspect of trust that would encourage the project-members to participate in knowledge sharing.

The interview participants emphasised that working with members who have a similar or same vision would make it easy to exchange what they know and what they would like to know. The individuals’ reasons for knowledge sharing would vary from person to person. Moreover, each member may have one’s own aim and objectives to achieve. The informants stated that when they carry out projects with anyone who has similar or the same point of view, it is much better and easier to complete the mission and the goals of the project. They expressed that knowledge sharing has also similar target of accomplishing the projects in the company. If they share knowledge with others who view the world with a similar lens, they could not only share knowledge with lessened
dissention but also strengthen the trust between the project team members. Thus, they proposed that sharing vision and working with them is not merely sharing in the literal meaning but also it would be one of the potential and strongest catalysts for letting the members take part in knowledge sharing as well as constructing the basis of trust for knowledge sharing in the project-based organisations. The informant FinCo-INT9 who is the tactical manager in the financial company mentioned that,

“I don't know the exact reason but when I work with an individual who has similar a world view or stance, I trust him more than anybody who has a different viewpoint from mine. For example, anyone who has the same religion, comes from the same region, or has the same nationality. Such commonalities make me to believe them or I believe they are more reliable than others. For me, knowledge sharing is the same as aforementioned thing. Based on my experiences, I used to share information those who have similar visions or goals. I always think that the sharing vision is the basis of collaboration and other cooperative activities in the company. Knowledge sharing is one of collaborative things therefore sharing vision is important.” (FinCo-INT3)

Another operational manager (FinCo-INT13) in the financial company signified the importance of vision sharing for knowledge sharing in the project-based organisations.

“The very fundamental level of knowledge sharing is based on vision sharing with the colleagues or my partners. When I proceed the project with similar goals, it is a little exaggerated, all the things were sorted out very easily or without any tensions from them.” (FinCo-INT3)

5.2.2.2 Clarifying the source

‘Clarifying the source’ is one of the significant factors of the sharing aspect of trust that would make it possible for the members to share knowledge effectively in the project-based organisations.

The research informants indicated that one of the essential elements of knowledge sharing behaviour is the clarity and reliability of knowledge sources. That is, the more reliable the source is the more vital participation of knowledge sharing. They mentioned
that the knowledge seekers would try to explore what they want to know from more reliable sources. When the information holders offer credible knowledge to the seekers, the trust between them would be enhanced and the knowledge sharing behaviours would be proliferated by the participants in return. The interview participants explained that sharing the clarified knowledge sources might be the symbol of mutual trust. For example, the directing manager of the construction management company (ConCo2-INT1) stated the importance of reliability.

“When it comes to knowledge sharing, I think the information about who is the expert or who is the master of certain fields would be much more important than the documented or stored knowledge in the system. Such information is really essential of the information, I don't share such information with individuals who want to know a certain field. I share the core of information with the very classified persons who I have known each other for quite a long time or highly trusted persons.” (ConCo2-INT1)

Likewise, the operational manager in the financial company (FinCo-INT1) also underlined the importance of clarified knowledge sources for knowledge sharing in the firms.

“Information of who the specialists are, and where it is, could be shared when the trust between the members is set up. The credibility of knowledge source is very important and makes the member come and participate in knowledge sharing.” (FinCo-INT1)

To summarise, the interviewees suggested that clarifying knowledge source would be one of potential facilitators to enhance interpersonal trust between the members which is the fundamental to knowledge sharing in the project-based organisations.

5.2.3 The affiliation category

There are four concepts in this affiliating category: communicating with others, reciprocity, benevolence to others, and proximity with others. When the project members sense that they belong to a certain clique, the trust between them would be enhanced. In
order to intensify the affiliation between the members, the interview participants’ suggestions could be grouped into four concepts. The following section expands on this.

5.2.3.1 Communicating with others

‘Communicating with others’ is one of the major components of the affiliating aspect of knowledge sharing that could enhance trust for knowledge sharing in the project-based organisations.

The interview participants considered that the trust between the project team members would be created by frequent contact and continuous communication with them. Especially, communication with the project team members is one of the most crucial things to recognise each other who has similar stance and who would be potential supporters of the firm’s knowledge sharing activities and so on. As it was mentioned in the previous section in ‘vision sharing’, knowledge would be shared more easily those who have similar visions or objectives. Communicating with others could influence and enhance vision sharing as well as strengthening bonds with the group members. The informants stated that by communicating with each other, one could not only transfer or exchange knowledge or what they want to know, but also deliver one’s positive or negative feelings and impressions to the members. As a result of this process, both parties would judge them and then determine whether to keep the relationship or not. In other words, communication is crucial within the project team as it deepens the relationship amongst colleagues, develops trust, and most importantly recognise and respect each other’s stance. The informant FinCo-INT13 who is in charge of an operational manager in the financial company indicated the important role of continuous and variety ways of communication with the team members.

“From time to time, we may misunderstand or mistrust others because we do not communicate directly. The discontinuity of communication is one of the main reasons of misunderstanding each other. When we exchange our information with others, we share knowledge immensely if we communicate a lot and frequently to others. Through lots of and frequently meeting and communicating, we get to know each other very well and trust has been established. So it is much easier to share knowledge with others in the team. For me, I have worked with my team and colleagues for eight or nine years. Some have left the company but most of
them are the same. For a long period of time, we have talked a lot and we know each other precisely, what out specialties and weak points are etc. Such communication can build up our people to bond together and trust them. It is very valuable asset for building up trust and for sharing or exchanging information and knowledge.” (FinCo-INT13)

The tactical level project manager (ElceCo-INT4) in the electronic company also stated the important feature of communicating with others for enhanced knowledge sharing.

“Communication makes me to discern hose in my party and who aren’t my side. I don’t want to share my intellectual asset with enemies. I’d like to share with my colleagues or partners. Such communication with others can be one of very effective ways to judge others. By doing this, the positive relationship would be more stronger and I will be able to protect myself from potential rivals” (ElceCo-INT4)

5.2.3.2 Reciprocity

‘Reciprocity’ is one of the important factors of affiliating category for knowledge sharing which could play an essential role to encourage knowledge sharing within the project-based organisations.

The interview participants emphasised that knowledge sharing and information exchanging would be impossible to take place within one party. Knowledge sharing would need to occur between two or more people in the group. Accordingly, reciprocity may be one of crucial attributes for enhanced knowledge sharing in the project-based organisations. In addition, the fundamental basis of sharing is the belief of reciprocity which one sacrifices oneself to offer his or her valuable intellectual assets to others and the beneficiaries would pay back in return. They asserted that without this kind of mutual trust or reciprocal belief, the knowledge sharing process would be impossible to take place in the project-based or any forms of organisations. Moreover, the quality of shared knowledge would be determined by the extent of mutual trust between both parties. As a result, the degree of reciprocity would be one of crucial elements to affect the trust to engage in knowledge sharing in the project-based organisations. For example, the
interviewee FinCo-INT4, who is a senior operational manager in the financial company, explained the importance of such reciprocity and knowledge sharing.

“Exchanging and sharing knowledge wouldn’t take place in the unilateral way. The basic condition of knowledge sharing composes of two or more people to engage in the deal. If the transaction occurs between the individuals who have same or similar goods, the key element to lead to the success of the business would be mutual trust, in other words reciprocity. In my project team, we work together with others who have a similar level of intelligence or knowledge. So when I or others want to exchange knowledge, the main determinant of participating in this deal is to what extent I believe or trust him or her. The knowledge trading without trust would be similar to the information which could be gathered from the library or Google. Reciprocity is one of main determinants to sharing knowledge” (FinCo-INT4)

Another tactical project manager (ElecCo-INT4) in the electronic company also viewed that reciprocity and mutual trust would be one of the fundamental elements of knowledge sharing in the project-based organisations.

“All the members in the company, regardless of the hierarchical level, have to bare in mind that mutual trust is one of the vehicles that leads to positive result of certain targets. In this case, in order for attaining successful knowledge sharing, trust between colleagues, trust between lower level and higher level, all kinds of trust are very important. For me, I have experience receiving shared knowledge with unfamiliar members. In this instance, the quality of information was very poor. I think because I don’t have any past relationship with them. The trust will directly affect the performance and quality. So it is very important.” (ElecCo-INT4)

5.2.3.3 Benevolence of others

‘Benevolence to others’ is one of the meaningful elements in facilitating aspect of knowledge sharing which would play an important role to promote knowledge sharing in the project-based organisations.
The interview participants revealed that one of the main reasons for volunteering in knowledge sharing is derived from an individuals’ good will, also known as benevolence. They asserted that such good intentions to help others would be one of the powerful promoters to engage in knowledge sharing. Moreover, the receiver had experienced others’ good behaviours and he or she would imitate such actions in response to them. The informants suggested that knowledge sharing would be based on spontaneous basis rather than forced or calculated one. For example, FinCo-INT7, who is the tactical manager in the financial company, explained his reason for participating in knowledge sharing as,

“When somebody comes and asks me certain things, it is usually a pleasure for me. In this case, my reason for sharing knowledge is caused by the altruistic intention. And this behaviour will have an affect on others behaviour of knowledge sharing as well.” (FinCo-INT7)

The directing manager of the design company (ConCo2-INT2) stated the imperativeness having a benevolent mind taking part in knowledge sharing.

“I think one of the big reasons of information sharing is my thinking towards others. I can’t bear to see someone in difficulties. In the company, when my colleagues or my team members are under a difficult situation, I can’t ignore it. Knowledge sharing is in a similar vein.” (ConCo2-INT2)

5.2.3.4 Proximity with others

‘Proximity with others’ is one of the critical factors of affiliating aspect of knowledge sharing which could have an essential role to encourage knowledge sharing in the project-based organisations.

The research informants stated that the degree of proximity between the members in the project team would make it possible for the knowledge seekers to acquire the wanted knowledge from the knowledge holders with ease. The proximity in this context stands for the psychological or mental distance between the members rather than the physical or virtual stance. They asserted that the psychological closeness with others may not only
be one of the potential promoters of trust to intensify knowledge sharing, but also one of catalysts to make the members feel working in the same group in the project-based organisations. Likewise, they asserted that the mental proximity would not only mean sharing knowledge, ideas or information but also enhance understanding of each other such as one’s advantage, preferences and so forth. Hence, they suggested that in order to encourage knowledge sharing in the project-based organisations, the team members should keep proximity between them. For example, the tactical manager (FinCo-INT1) in the financial company stated that,

“Through constantly contacting other members in the team, I can understand others’ good points, specialties, or preferences. In doing so, I will feel that we are getting close and we can share valuable things and we are the same team.” (FinCo-INT1)

Another informant who is the director of construction projects (ConCo2-INT2) also stated the relationship between the closeness of members and the knowledge sharing.

“I think it is very natural to build up trust with anyone who has worked with me for a long time. There might be telepathy? Talking to my close members would be much easier than talking to new faces. I think it is the same in the knowledge sharing. I can get to know all about my old friends and I know that he will share his knowledge.” (ConCo2-INT2)

The tactical manager in the electronic company (ElecCo-INT5) suggested a similar point of view regarding proximity with others as,

“I started a new project, most of our team members came from the previous one. So nearly all of the members are very close and we almost know everything about each other. Such close relationship makes us trust and allows the free-flow of information in the team.” (ElecCo-INT5)

5.2.4 The supporting category

There are three concepts in this category: management commitment, continuity, and technology. The project members who are supported from top management with
continuous manner would be easy to stimulate to engage in knowledge sharing in the project-based organisations. Moreover, newly developed information and communication technology would also be a potential facilitator of knowledge sharing between the members. Each concept of ‘supporting’ category is dealt with in the following subsection.

5.2.4.1 Management commitment

‘Management commitment’ is one of the crucial elements of supporting aspect of knowledge sharing which would influence enhancing knowledge sharing in the project-based organisations.

The research interview participants stated that the management commitment to knowledge sharing and knowledge management would be one of the significant factors to encourage the employees to take part in them. They stressed that consistent support from the higher level of the firm would assist its members reaching their shared aim, which is enhanced knowledge sharing in the company. The informants stated that the employees tend not to have any options to share or not to share knowledge, since the basic policy will make them follow the company’s policy. In this context, knowledge sharing is the basic policy and they will have to share knowledge regardless of their own decisions. Moreover, because of the top management’s strong influential power on the firm’s overall behaviour and future directions, knowledge sharing activities which are accompanied with top management would be easier to implement compared to the bottom up movements.

The informant FinCo-INT11 who is the operational manager at the financial company stated the importance of management support as,

“I want to share my knowledge with others in my mind but the company doesn't support it. I think, under such an environment knowledge sharing may be hopeless or an avoiding thing to do. The support from management is more important than the employees’ interests. As their decision will navigate the entire company’s direction to go.” (FinCo-INT11)
The tactical manager (ConCo1-INT1) in the construction company pointed out the importance of the top management decision to knowledge sharing.

“I think in most of the companies in Korea, the CEOs decision is one of the most influential factors in carrying out tasks. My company is the same. I have seen many management campaigns and activities for a long time. Majority of the cases were adopted by the CEO’s decision. I think, at the moment, in my company, we have been campaigning knowledge management from a couple of years ago. It’s based on the new CEO’s thinking and his passion of knowledge management. As we can see from these cases, the top management decision or commitment is one of the crucial deciders to certain decisions, for example knowledge management, knowledge sharing, etc.” (ConCo1-INT1)

5.2.4.2 Continuity

‘Continuity’ is one of the meaningful factors for ‘facilitating’ aspect of knowledge sharing which would play an important role in intensifying knowledge sharing in the project-based organisations.

The interview participants emphasised that continuous support from all the members would play a significant role to successfully implementing knowledge sharing in the project-based organisations. In this context, they asserted that the continuous support is referred to two things; one is continuous support from the top management, and another is continuous support and participation from the employees (i.e. Other members in the project teams and the company). Firstly, they pointed out that one of the potential problematic situations regarding knowledge sharing would be caused by the instant interest of knowledge sharing from the employees and top management. Another problematic situation is that while top management would be interested in implementing knowledge management, the employees in the firms may be reluctant to utilise it. According to the interview participants, key solutions to such situations could be continuous support from all levels in the organisation. For example, the tactical level manager in the electronic company (ElecCo-INT6) stated that,

“Knowledge management shouldn't be a one time event or just a new management fashion such as reengineering, sigma six etc. I have seen many cases
fade away because management interest faded away. In order to lead the employees’ active participation of knowledge sharing, I think the constant and concrete support and interest are the most critical elements for the success of it. Moreover, such support would be the basis for building trust among all members in the company.” (ElecCo-INT6)

The informant FinCo-INT7 who is the tactical manager in the financial company stated that,

“Even if the employers push us to share knowledge and use the knowledge system, the employees wouldn't participate in such activities. After all, it may be vain or fail. For example, now I decide to share my useful knowledge and information with my group members but remaining members don't understand my intention and they don't engage in as I am doing. I think the result will be concluded as a failure. Even if it is launched, it would disappear soon. Continuous interest and continuous support may be one of essential success factor of knowledge management with the long-term perspective.” (FinCo-INT7)

5.2.4.3 Technology

‘Technology’ aspect is considered as one of the significant elements which would be a potential facilitating component to encourage knowledge sharing in the project-based organisations.

The research informants indicated that technology is one of the inevitable factors to carry out projects in the recent business environments. Moreover, knowledge management or knowledge sharing that is facilitated by information and communication technology is an important business environment change compared to the past. They suggested that one of the immense influences of technology-driven knowledge sharing in the project-based organisations is the enhanced connectivity with separated members in the world. In other words, it means that they could overcome the temporal and spatial restrictions arisen by the geographical diversity. Although lots of the informants stressed the positive role of technology which would intensify knowledge sharing in the project-based organisation, some of the interview participants also considered the potential negative functions of technology in knowledge sharing. They suggested that when management establishes
knowledge systems in the firm, they should consider the tailored system such as consideration of the employees’ requirements, the most beneficial functions to the entire company and so forth. In addition, the interview participants also worried about the vulnerability of the information and communication technology in the recent years. For example, the interviewee FinCo-INT11 who is the operational manager in the financial company stressed the significant role of technology that would intensify knowledge sharing.

“Recently, we have experienced the power and the importance of information and communication technology in all areas. When it comes to knowledge sharing, we can’t help but mention the role of technology in knowledge sharing. The Internet, mobile phones, smart phones, such IT devices are one of very typical examples of the great impact they have in our life. The enhanced connectivity with others makes us ask any questions all the time and anywhere. I do think that we can’t ignore the important role of technology on knowledge sharing in my project team and the entire company. (FinCo-INT11)”

Another interview participant in the financial company, FinCo-INT2 (Tactical manager) also stated the important role of technology.

“Many companies have operated its business cross the borders in the recent era. For my company, the headquarters are located in Bermuda, the Asia-Pacific head office is in Sydney, the European head office is in London, and the IT centre is in India. In order to communicate, share, and exchange information with our members in the world, information and communication technology is the core in connecting us together. If there were not IT, we would be still transferring information using fax or sending international mails to them to get the information. In our generation, in order to promote better sharing, flowing or exchanging information with our team or crews, technology is a very important enabler in enhancing knowledge sharing.” (FinCo-INT2)

As mentioned in the previous part of this sub-section, some of the informants warned the over-emphasis of technology in knowledge sharing. The informant FinCo-INT9, who is in charge of the operational level project manager at the financial company, suggested
the importance of tailored or customised systems for knowledge sharing in the organisations.

“Recently, majority of the individuals’ tasks are processed by computers. IT is a very essential element of today’s business environment and we don't feel its necessity and significance as if we don't recognise the existence of the air for breathing in life. I completely agree with the importance and need of technology but the company has to consider some more. In order to cut down the expenses of IT, lots of firms used to buy pre-fabricated software packages that were sold in the market. Such packages had not considered our members’ requirements and our company’s characteristics so it may be difficult to be fully harnessed in the company. In this case we should adjust ourselves to the system. I think this is wrong approach. In order to maximise knowledge management or any other relevant activities which is supported by technology, the firm would have to consider to set up a tailored system which reflects on the users’ requirements.” (FinCo-INT9)

The director ConCo1-INT1 at the construction company indicated the recently raised issues of information vulnerability and its security in knowledge sharing. That is, as the advancement of information and communication technology, it would be much easier to access the knowledge and information any places. However, the valuable information should be dealt with only for the permitted personnel within the organisations.

“As the development of information and communication technology, the accessibility of information has increased significantly compared to the past business environment. The increased accessibility has brought us better exchanging information to others. However, personally speaking, we have to consider the other side of technology. Recently, we have seen lots of news articles in terms of the personal information hacking and fraud usage of such information. When I hear such news, I think that the shared knowledge in my company has to be preserved securely from unauthorized access or attacks.” (ConCo1-INT1)

5.3 The relationship core category

The core category of relationship consists of three categories which are linking, understanding, and membership. The research informants indicated that relationships
between project team members would be one of significant factors to influence on the individuals’ behaviours of knowledge sharing. Each of their concepts in the categories is described in the following section.

5.3.1 The linking category
There are two concepts in this category: meeting the members in various ways, and rapport building. In order to build up a positive relationship with the project team members for knowledge sharing, the research informants suggested that they have to not only exchange one’s intellectual assets but also share others such as sympathy, comprehension and so forth. The following section of this sub-chapter deals with the details of each concept of bartering category.

5.3.1.1 Meeting the members in various ways
‘Meeting the members in various ways’ is one of the important elements of relationship aspect of knowledge sharing, which would be an essential player for encouraging the members to participate in knowledge sharing in project-based organisations.

The research informants indicated that the fundamentals of creating a positive relationship with others would begin with frequent contacts with the members in various ways such as formal and informal meetings, conferences, banquets, picnics and so forth. They asserted that while the formal conferences would be one of essential methods of the meeting in the company, informal contacts could have a far greater impact on building relationships with others. For example, one informant in this study suggested that valuable information and knowledge would be circulated with colleagues from informal meeting and informal places such as lounges, or cafeterias. In addition, close relationship with other members would make them be more relaxed, when they meet others at the informal places. According to the research informants, meeting the members formally and informally would enhance the capability of communication between the members, and that is one of ground elements for knowledge sharing in the project-based organisations. Putting together with the informants’ explanation, various ways of meeting the members would be one of the potential sources of gathering knowledge from others as well as one of ways to intensify the relationship with others in the project-based
organisations. For example, the operational manager in the financial company (FinCo-INT13) stated the importance of a meeting that is arranged by the senior level of the team.

“Meeting up people in many ways would make it possible to share and exchange information, knowledge and others in a natural manner. Especially, in the company, the meeting arranged by the supervisors or a higher level of staff would be useful in getting to know each other and to meet them regularly. When I participated in the project team I saw some of them before and some for the first time. So an organised meeting would be one of the ways to get in touch with the new faces and it would give us a chance to build new relationships with them.” (FinCo-INT13)

In addition, another operational manager in the financial company (FinCo-INT9) pointed out that an informal meeting as an important wellspring for knowledge sharing.

“The information or knowledge wouldn’t be shared only inside the firm. When we meet with our colleagues outside of the office, we can get a new, very unique or useful knowledge by coincidence. For example, when I met a colleague of mine at a pub after work and we spontaneously started talking something about our new regulations. Sometimes, we have a metaphor for comparing our actions in the office which we figure out the problems in this situation. In addition to this, we have a chat in the lobby or in the lounge, share our concerns, and then can generate solutions from other project team members coincidently in an informal meeting.” (FinCo-INT9)

One of the tactical managers in the construction company (ConCo1-INT2) explained the importance of regular meetings with members.

“When a stranger comes and ask me for information, I would hesitate to answer the questions. On the other hand, when someone who I already know through meeting lots of times before asking me to share something, I will give it to him or her. I think regularly contacting people in the context of knowledge sharing may influence on trust and relationship to do something with them.” (ConCo1-INT2)
5.3.1.2 Rapport building

‘Rapport building’ is one of the essential features of the relationship aspect of knowledge sharing which could be a potential facilitator of enhanced knowledge sharing in the project-based organisations.

The interview participants stated that the fundamental of knowledge sharing in their project teams might start from building up positive connections with members. According to the interviewees, the affirmative relationship with the members should be cultivated for increased knowledge management and knowledge sharing in the project-based organisations, since knowledge sharing is similar to social events. In addition, the research informants stated that the personal networks that may be constructed based on the positive relationship would determine the quality of shared knowledge and the easiness of acquiring the knowledge from others. Accordingly, rapport building would be one of greater facilitators of relationship for enhanced knowledge sharing in the project-based organisations. For example, one of the operational managers in the financial company, FinCo-INT3, stated how the relationship with others would have an influence on knowledge sharing and its importance as,

“If the relationship between me and you is quite good, knowledge sharing would be possible to happen but if the situation is reversed, I mean a unfavourable relationship with you, it would be impossible to do that. I think all the social processes may be the same whatever the process is. And the basic rule of exchange would happen on a good relationship between two or more parties. Under a tough relationship with them, it would be impossible to share knowledge or exchange anything.” (FinCo-INT3)

Another operational manager in the financial company, FinCo-INT8, also explained the crucial role of the relationship on knowledge sharing.

“I’ve made a lot of connections with others through my personal networks. And such created networks will be a source for creating new relationships. The relationship and personal network are one of my main sources to gain knowledge from others and the main route for sharing knowledge with others.” (FinCo-INT8)
The informant ConCo2-INT1 who is the directing manager stressed the significance of rapport building in knowledge sharing.

“Based on the long working experiences, I have met and built my personal network. Those people are my source for getting new knowledge.” (ConCo2-INT1)

The informant FinCo-INT5, who is the operational manager, expressed how he creates own network, and how the relationship would affect sharing knowledge the quality of knowledge in the company.

“For me I create my personal network with others by judging to others nature and preferences. If the person has similar characteristics with me, it would be much easier to build up a rapport with him or her. On the other hand, if she or he has a different nature to me, I wouldn’t make the relationship and it would take much more time to get closer to them. And for knowledge sharing, under the former situation, the sharing will be much easier than the latter relationship...I do stress the importance of relationship with others in knowledge sharing because it will determine how one would access the knowledge easily and how good the acquired knowledge would be. For me, I am working with the higher levels of managers in this company. So for this reason, I frequently come across high quality of information or knowledge which would only be dealt with the seniors.” (FinCo-INT5)

The interviewee FinCo-INT1 who is the tactical manager, explained how the constructed rapport would be used for knowledge sharing,

“There are a lot of specialists and experts in my company and outside of the company. I think building a rapport with them will make it possible for the individual to get lot of different knowledge from them. For me, I am a specialist in the Japanese area, but I am awkward for other countries such as South Korea, China, and Taiwan etc. When I have difficulties with the Korean section, I will ask another Korean expert in order to figure out my difficulties. As a result, various relationships will be a potential facilitator of sharing knowledge from others” (FinCo-INT1)
5.3.2 The understanding category

There are three concepts in this category: shifting the role or rotating the job, horizontality rather than verticality, and training and educating the members. According to the research interviewees’ opinions, in order to create a preferable relationship for knowledge sharing in the project team, the individuals should understand each other, such as ones’ merits, specialties, and so forth. Furthermore, the horizontal system would be preferred to share knowledge with the members. The following section of this sub-chapter deals with each concept in the understanding category.

5.3.2.1 Shifting the role or rotating the job

‘Shifting the role or rotating the job’ is one of the major components of the understanding aspect that would enhance the relationship between members to encourage knowledge sharing in the project-based organisations.

The research interview participants indicated that in order to encourage knowledge sharing in the project team, one should understand others’ works, advantages, and specialties. That is, they suggested that misunderstanding of others would be caused by lack of understanding others. Such misinterpretation would make it difficult for the members to communicate and to share knowledge between them. In order to overcome such difficulties, the interview participants suggested that job rotation would be one of effective ways to broaden the width and depth of mutual understanding in the project teams. They explained that one would realise when he or she takes the others tasks and then, they would comprehend the substantial difficulties or problems with respect to one’s work role. Moreover, one could update one’s own directories of potential knowledge sources as taking part in job rotation in the team. As the researcher summarised the interviewees’ assertions, shifting the role with others would be a useful method to strengthen the understanding of others for enhancing knowledge sharing in the project-based organisations. For example, the operational manager in the financial company (FinCo-INT3) explained the significant role of shifting the role in the organisation as,

“Job rotation is an effective way to understand others. To do so, I can realise that such person has done such tasks. And so he or she has such information. This will
be helpful for my information source database in my brain. In the future, if I have any difficulties, I will do refer back to my experience and I will come and ask him” (FinCo-INT3)

In addition, another operational manager FinCo-INT13 also pointed out job rotation in the company.

“Job rotation will be very useful in understanding each other. As taking a different role, I can know what knowledge is required in a certain job role and what knowledge would be helpful to me in the future work etc. Understanding each other would be a very important point in terms of knowledge sharing. Sometimes, when I work in a team, I am very busy to complete the task. And someone may come and ask for help. When I am in this situation, both of me and the comer, all we are very tough moment. If we had already experienced with work before, we could have prevented this situation and increase knowledge sharing in the team. My point is, we don’t need to be proficient in others’ tasks. I mean, we can understand each other’s environment and situation through rotating jobs.” (FinCo-INT13)

5.3.2.2 Horizontality rather verticality

‘Horizontal relationship with the members’ is one of crucial factors of the understanding aspect that would be one of potential facilitators to promote better relationship to encourage knowledge sharing in the project-based organisations.

The interview participants stated that it would be much easier for encouraging knowledge sharing in the project-based organisations in creating a positive relationship with the members from horizontal connections rather than vertical system. Although it could be inevitable for the modern organisations to utilise hierarchical or pyramid structure for managing their organisations, they also indicated that more flexible and free communication based on the horizontal structure that overcomes the hierarchical barriers would be one of potential facilitators of knowledge sharing in the project-based organisations. They asserted that it would be impossible to modify the overall firm’s structure but the higher level of management would guarantee and promote all the members to more freely communication with others. For example, the senior operational
manager (FinCo-INT4) in the financial company explained the relationship between the structure of organisations and the degree of knowledge sharing.

“The structure of organisations may be one of crucial factors to determine one’s intention to participate in knowledge sharing. I think the horizontal structure would be far more flexible to share ideas with others than the vertical structure. I am not saying that there is nothing to share knowledge in the vertical structure. My point is, it would be much easier to communicate with others in the horizontal system.” (FinCo-INT4)

One of the tactical managers (FinCo-INT7) in the financial company explained the relationship between structure and communication for knowledge sharing.

“I think free communication with others may be the fundamental of knowledge sharing in the company. In order to do so, I think the flat structure of communication would be beneficial.” (FinCo-INT7)

The tactical project manager (ElecCo-INT4) in the electronic company mentioned the importance of horizontal communication to create positive relationship for knowledge sharing as,

“I think that when we communicate with others, there are two types of communication, horizontal and vertical communication. Most of the companies in my country, South Korea, adopt the latter one, vertical type. The merits of this form are that it is very clear one’s liabilities and duties so it would be very easy to discern my faults and responsibilities when one is in difficulty. However, it is very difficult to freely communicate with others, especially with the upper level in this pyramid. On the other hand, the former one, I think it is very useful to communicate with others and share ideas and knowledge with others in the team. I think, in order to encourage knowledge or information sharing in the organisation, the structure for communication may be very important.” (ElecCo-INT4)
5.3.2.3 Training and educating the individual members on the regular basis

‘Training or educating the individual members on the regular basis’ is one of essential features for the relationship aspect of knowledge sharing, which would be a potential facilitator for encouraging knowledge sharing in the project-based organisations.

The research informants emphasised that while creating a relationship with others may be one’s own responsibility, the company would provide the individual to educate and train how to do that in effective ways. They indicated that the training would not only be to teach them the methods of knowledge sharing or to inform them the current issues in the company, but also to offer the venue for the members to meet various members from the different divisions or teams from the entire organisation. One of the interesting findings in terms of education and training is that majority of higher position informants such as senior project managers or directors preferred education and training methods as a means for encouraging members in engaging in knowledge sharing. They stressed that from the company’s perspective, training would be one of effective ways in cost and time. Moreover, from the employees’ point of view, it would be a helpful way to learn that knowledge sharing could be one of the most productive approaches for enhancing the individuals’ performance level. Thus, education or training would be beneficial for both of the employers and employees to utilise knowledge sharing in the project-based organisations. For example, one of senior operational manager (FinCo-INT4) in the financial company stated that,

“I suppose from a company’s perspective, when it comes to knowledge sharing or knowledge transferring, you train staff in what’s happening in your company. That’s where knowledge management or knowledge sharing comes in.” (FinCo-INT4)

Moreover, another senior tactical manager (FinCo-INT2) in the financial company also suggested that the importance of training for knowledge sharing in the company.

“Most of the companies have two different types of trainings. One is initial training that is carried out just after entering the company, and another is periodical training for the employees. The main role of education in the company may increase the employees’ level of knowledge to a certain degree. In terms of
knowledge sharing, we don’t know how to do it exactly but if we are trained in such ways, we will know how to do it and how to use the firm’s knowledge system for sharing, transferring and storing our valuables.” (FinCo-INT2)

The director (ConCo3-INT1) in the structure design company explained the benefits of training for knowledge sharing as,

“I think training is highly effective in enhancing the employees’ level of understanding regarding knowledge sharing. It is very useful to share good information and knowledge within the company. The best way to educate each employee may be face-to-face training. However the company could spend too much time and money on it if we do so. However, when training the employees with group or team, it is a cost effective way to deliver my message to the employees and to highlight the current issues in our company. Also, I think that is not one direction inputting but it may be bilateral communication or sharing method of knowledge and information.” (ConCo3-INT1)

5.3.3 The membership category

There are three concepts in this category: recruiting, strategic alliance, and human resource management. In order to preserve positive relationships with potential knowledge sources, the interview participants suggested that they should maintain connections with people who are similar level of knowledge. In order to preserve positive relationship between the members, selecting the appropriate staff may be helpful when they enter the company. In addition, some of the members would ally with others who have a similar level of knowledge. The following section of this sub-chapter deals with the details of each concept of membership category.

5.3.3.1 Recruiting

‘Recruiting the proper personnel’ is considered one of significant elements that would be a potential facilitating factor for encouraging membership of knowledge sharing in the project-based organisations.
The research informants indicated that in order to promote knowledge sharing between the members in the project teams, one of the fundamentals is that they are working with the people who have the similar or higher level of knowledge. As lots of the interview participants considered knowledge sharing as a type of transaction or trade between the individuals, they would not share their valuable intellectual assets unless they would expect nothing from the others. The interviewees commented that basically they believed that the persons who are working in the company might mean all the employees have over the certain level of knowledge. Therefore, all of the colleagues in the firm would be one’s potential knowledge sources, and so for this reason they would be willing to share or exchange knowledge and information with others in the organisation. For example, the informant FinCo-INT3, who is in charge of the operational manager, stated that,

“I am trying to give my information to others but I can’t expect any return from him or her? I think it would be very difficult to share under this situation. Nobody will offer one’s valuable assets without any hesitancy. However, my time in the company, I used to share and give my information to others because anyone who is working in this company already has certain level of knowledge. I think our company has very strict criteria of recruiting people from all around the world. I’ve already noticed the recruitment regulation of my company and I’ve shared knowledge with our colleagues.” (FinCo-INT3)

In addition, another tactical manager in the same company (FinCo-INT6) also pointed out the significance of the people’s perception that they are working with more intelligent people.

“I think lots of people may talk about motivation, rewards for enhancing knowledge sharing. However, for me, I have a different point of view when it comes to talking about it. In order to smoothly share knowledge with the members, the people who are working in the company are significant. I mean, when I feel I am working with people who have equivalent knowledge as me, I may be willing to share mine. I think in the basic process to achieve this requirement, the company has to hire the proper person in the proper position from the very initial stage. With this point of view, successful knowledge sharing may depend on the individual who has been selected to work in this company is important.” (FinCo-INT6)
5.3.3.2 Strategic alliance

‘Strategic alliance’ is one of meaningful elements of the membership aspect of knowledge sharing which would play an important role for enhancing the membership between the individuals in the project-based organisations.

The research informants indicated that the strategic alliance between the project team members or other project teams would be carefully considered since it can have a significant impact on determining the quality and quantity of shared knowledge in the project-based organisations. When the company or the project team carries out its projects, it would be required to create a clique for achieving the certain missions and objectives of the projects. According to the informants, such association is not only a kind of method to maximise the level of each unit’s capability but also a channel to share valuable information and knowledge between the members of the group. Thus, they implied that in order to promote knowledge sharing in the project-based organisation, creating alliance with people who have the similar level of knowledge would be useful among the members. For example, the director of the construction company (ConCo1-INT1) stated the importance of such alliances for knowledge sharing.

“Among the major construction companies, they have been sharing the contractors’ information for a long time. It is an unspoken rule between them. If anyone wants to obtain such information, they have to become a member of this association. I think, in any field of work, there might be such implicit or secret unions for sharing valuable information. Such alliance will be one of very useful sources of knowledge and setting up the strategies. And this kind of alliance would be one of potential influencing factors for knowledge sharing in any sectors of business.” (ConCo1-INT1)

The director of the construction design company (ConCo3-INT1) also stated the significance of association with the others for enhanced knowledge sharing.

“As we are working as a partner of the big construction company, we can share any knowledge from this company. It is a kind of golden tickets to access their knowledge reservoir. The relationship between my company and this one is a kind
of strategic alliance. I think such alliance is very important, when sharing knowledge in small and medium sized companies.” (ConCo-INT3)

5.3.3.3 Human resource management

‘Human resource management’ is one of the important elements of membership aspects of knowledge sharing which would be an essential player for encouraging the members to engage in knowledge sharing in the project-based organisations. In this context, human management means not only allocation of proper personnel for sharing knowledge with other members during projects’ execution but also assessment of each members capability and expertise for better performing projects.

The interview participants indicated that there are two aspects of human resource management that would promote the members to participate in knowledge sharing: reflecting on the individuals’ capabilities; and assessing the personal progress and endeavours. Firstly, they emphasised that the management should reflect on the individuals’ capabilities and expertise. That is, each individual has his or her own merits and demerits, when they work as a member of the project team. In order to make them demonstrate the best effort, the leader of the project team should consider the one’s expertise and advantages. If the member displays the capabilities, he or she would feel that they are members of the team, and they could share his or her knowledge to others. For example, the operational manager of the financial company (FinCo-INT5) expressed that,

“I’ll show you a short example. When the national team match is held, the team manager will select the best suitable players to beat the opposing team. When it comes to knowledge management, the management should take similar action as the example. In other words, the company should deploy the appropriate personnel based on one’s capabilities. Based on this effort, they will compose the best project team. If I work with others in the project team but I feel like that he or she is behind us that he or she hasn’t got the proper knowledge. Therefore, I wouldn’t share knowledge with others.” (FinCo-INT5)

Secondly, the individual member would be able to evaluate one’s progress or endeavours in terms of knowledge management and knowledge sharing. The informants indicated
that although it would be difficult to evaluate one’s knowledge sharing endeavour because of its intangible nature, the other members would be able to assess his or her contribution for doing certain things. They explained that knowledge sharing would be the similar vein and management should assess members’ activities regarding knowledge sharing appropriately. The informant ElecCo-INT6 who is in charge of the senior tactical manager in the electronic company explained that,

“I think one of the problems in terms of knowledge management is that we can’t evaluate the degree of one’s participation in numbers or quantified amount. We can’t mark it on numbers in the booking. It depends on one’s subjective judgments. The proper assessment will be one of crucial factors to lead the members participation in.” (ElecCo-INT6)

Hence, the research interview participants suggested that the appropriate assessment by management would significantly influence on one’s intentions to participate in knowledge sharing. As a result, the management should build up the proper systems of assessment for the individual members’ knowledge sharing participation and other relevant activities.

5.4 The motivation core category

The core category of motivation consists of three categories, which are workload, culture, and remunerating. The research interview participants expressed that one of the crucial role to management is how to motivate the employees to take part in knowledge sharing. They indicated many problems of knowledge sharing as well as suggested the effective approaches of motivating the members in the project-based organisations. Each of their concepts in the categories is described in the following section.

5.4.1 The workload category

There are three concepts in this category: overcoming the task inundation, integration with daily tasks, and changing perceptions. According to the research informants, most of the difficulties of knowledge sharing are arisen from work-related problems. In order to effectively promote knowledge sharing in the project teams, the managers should deal
with such situations with the perspective of individual members. The following section of this sub-chapter deals with the details of each concept of workload category.

5.4.1.1 Overcoming the task inundation

‘Overcoming the tasks inundation’ aspect is considered one of the significant elements that would be a potential facilitating factor for promoting knowledge sharing in the project-based organisations.

The research informants indicated that one of the most common difficulties regarding knowledge sharing in the project team could be the abundance of tasks to fulfil during the project execution within the time schedule and budget. They drew attention to that reduced workload would be a potential motivator for the members to encourage sharing their valuable intellectual assets with others. Majority of the interviewees explained that although the individual members had already recognised the importance, and usefulness of knowledge sharing from past experience or training, the overload of tasks would be one of major barriers to engage in knowledge sharing. They pointed out that in order to share knowledge actively and frequently during the project execution, the individual members would need sufficient time to do that. However, the company was not able to permit sufficient time for this in reality. A number of interview participants implied that in order to motivate the members’ participation of knowledge sharing, the company should reduce the individuals’ tasks. For instance, the director of the structural design and engineering company (ConCo3-INT1) described the current situation of task inundation and knowledge sharing as,

“I have encouraged the employees to participate in knowledge sharing. However, when I listen to them, they always complain to me that they are very busy and that nobody will take on another job.” (ConCo3-INT1)

The directing manager in the electronic company (ElecCo-INT3) stated low the level of participation in knowledge sharing that,

“Why don’t I participate in knowledge sharing? This is because our Koreans are too busy to take extra work. The company pushes us to use the knowledge system and we have to upload knowledge in the system. How do I manage it? I upload all
I know from the project in one time. Workload wouldn’t allow me to share.”
(ElecCo-INT3)

The tactical manager at the financial company (FinCo-INT1) revealed the realistic point of view in terms of knowledge sharing in his company.

“A lot of employees know the advantages of knowledge sharing but we are thinking that it’s time consuming. As I’m too busy to undertake my work, I don’t want to spend extra time in sharing information.” (FinCo-INT1)

Moreover, the operational manager in the financial company (FinCo-INT9) explained how to encourage people to take part in knowledge sharing by reducing the workload.

“If the amount of task is reduced, one could become relaxed and there would be a time to reflect on other factors and people. For example, knowledge sharing would be possible to do if one has enough time, that is, the work is reduced and then he or she will be more benevolent to help others. How dare can I possibly sacrifice myself to help others if I am busy and I don’t have enough time to do so? We are working in superabundance of workload.” (FinCo-INT9)

5.4.1.2 Integration with the individuals’ tasks

‘Integrating with the individuals’ tasks’ is one of the significant elements of workload aspect of knowledge sharing, which would play an important role to encourage knowledge sharing in the project-based organisations.

The interview participants emphasised that the most ideal case of knowledge sharing in the project team is to integrate it within the individuals tasks, so it would become as a part of work. They asserted that the integrated form of knowledge sharing would not only enhance the efficiency of projects but also transform each member’s perceptions to knowledge sharing. For example, one of the tactical managers in the financial company (FinCo-INT6) stated the problem of knowledge sharing is that it is not a part from the individuals’ work.
“If you don't have time right now, it becomes a bit of an imposition that takes you away from people’s day-to-day jobs and they have to work extra time for uncertain benefits in the future. Giving support from above to be able to build that into their own, current role or time, they would be motivated to take part in sharing knowledge.” (FinCo-INT6)

The senior tactical manager in the electronic company (ElecCo-INT1) explained the benefit of knowledge sharing which is integrated within one’s tasks.

“The most ideal case is integration with each individual’s daily tasks. I mean, not becoming extra one. For our knowledge system, there have been some changes in terms of the knowledge system. That is, during the project execution, we have to put all the information and knowledge that had gathered from each bundle of tasks. If we don’t upload the information on the system, we can’t get the access to the next tasks. I think this knowledge system is very useful for the current users and the future users. As we to do so, we can revise our past works and others will be possible to acquire the information if it is relevant to them.” (ElecCo-INT1)

The informant FinCo-INT1 who is the tactical manager showed his case of the integration with personal tasks and knowledge sharing.

“I think knowledge sharing should be integrated with the individual’s daily tasks. For example, I make a daily logbook of my ideas and my work progress for the future usage.” (FinCo-INT1)

Therefore, the research informants proposed that task integration would have a significant role to play in order to actively get team members to share knowledge with others in the project-based organisations.

5.4.1.3 Changing the individuals’ perceptions

‘Changing the individuals’ perceptions’ is another important element of the workload aspect of knowledge sharing which would be a crucial player for promoting the members to participate in knowledge in the project-based organisations.
The research informants stated that most of the employees in the company might consider knowledge management or knowledge sharing, as a mandatory or compulsory task to carry out rather than a spontaneous action. They explained that the individual’s behaviours would be affected by each person’s intentions or perceptions towards such actions. For example, if someone shows a positive attitude to knowledge sharing, the individual’s intention or perception would be optimistic as well. Based on such insights of members’ behaviours, they pointed out that changing one’s perception and mindset with regard to knowledge sharing is one of constructive ways to improve one’s capability rather than being irritating or compulsory part of duties, would be one of greater influencing components to the individuals’ behaviour. As the members’ perceptions changed, each would recognise knowledge sharing is a part of work and they would not consider it as a burden. For example, one of the senior tactical managers in the electronic company (ElecCo-INT1) indicated the significance of people’s perceptions.

“When I take a look at our knowledge system, I can recognise how the members treat our system. In some of the cases, the uploaded information is so great and it will be very useful to others. On the other hand, for some pieces of them, they just uploaded things just as they can’t resist the company’s compulsion. The former case, the writer considered knowledge management would be a very useful tool for performance improvement. However, the latter case, they would think that they have just finished up their mandate tasks. I think this example would suggest the importance of people’s perception toward things. If I were in top management, I would try to change the people’s perception to knowledge management. Changing one’s mind or thinking would be one of powerful motivators to do something. I can take them to the well but I can’t make them drink.” (ElecCo-INT1)

The operational manager in the financial company (FinCo-INT9) presented the importance of changing perceptions as,

“I think one of the most essential motivators for human’s behaviours may be self-motivation. Everyone has a force to move oneself to a certain direction. I think this force may be a self-motivator. The power of such motivator would be far greater than others. Through self-motivation, we will be able to change our perceptions and our thinking. Personally speaking, the best approach in
motivating people to participate in knowledge sharing would be changing their thinking. If we treat it as a burden, it definitely would be a burden. But if we think it as an enjoyment with others, it would definitely be an enjoyment." (FinCo-INT9)

Another informant from the financial company (FinCo-INT11) stated that how it would be easy to motivate people who change one’s perceptions.

“Lots of people have already recognised the importance of knowledge sharing and it is one of the essential things to improve the firm’s performance level and the employees’ competences. The company has been trying to motivate us to participate in knowledge sharing and to use knowledge management systems. I think it may be easy to motivate the person who has already known its usefulness. The basics of motivation would be changing people’s mind." (FinCo-INT11)

Therefore, changing the members’ perceptions would be a potential motivating element for enhanced knowledge sharing in the project-based organisations.

5.4.2 The culture category

There are five concepts in this category: tolerating failures and challenges, communication, willingness to new comers or novices, accepting diversities, and less competitive atmosphere. In order to promote knowledge sharing in the project teams, the overall atmosphere of the unit would be one of the considerable factors for the individual members’ behaviour regarding knowledge sharing. The following section of this sub-chapter deals with details of each concept of culture category.

5.4.2.1 Tolerating failures and challenges

‘Tolerating failures and challenges’ is one of the important elements of the culture aspect of knowledge sharing that would influence on the individuals’ behaviours to knowledge sharing in the project-based organisations.

The research informants suggested that in order to promote sharing or exchanging knowledge in the project team, the organisational atmosphere should be more open-minded towards failures and challenges. They indicated that since all projects will not be
able to succeed, the failures might be inevitable things accompanying with the project’s progress. However, some of the members would be wary of exposing or sharing such negative consequences to others because he or she would worry for the blame or reproaches from others. The informants stated that all the knowledge produced during the project should be shared with all the members because failure teaches success. Moreover, they pointed out that the project team members should change their perceptions of others’ opinions that are a valuable nutriment rather than reprimands. For example, the informant ElecCo-INT1 who is the tactical manager in the electronic company explained the overall culture of the company and how it would affect on the employees’ behaviours of knowledge sharing.

“I don't know others’ ways of behaviours towards failures. But our company, we don't care about failures. We aren’t nervous to failures or challenges during the projects. Such corporate culture would be one of the fundamentals of my company. In addition, such atmosphere does not make us hesitant to share our knowledge with others.” (ElecCo-INT1)

The tactical manager in the electronic company (ElecCo-INT5) also stated the importance of culture to knowledge sharing.

“The negative results that can’t meet the basic criteria or below our expectations will also become a very useful source of knowledge. In my company, management doesn’t blame us in producing any information and knowledge during a project. Failures may be a very good source of our performance improvement and development of new devices. For example, nylon was developed accidentally in the lab. Another point is, when we carry out projects, if somebody covers up mistakes or failures in order to avoid criticisms from others, it may eventually become a really big problem which we can’t deal with in our team or the individuals. In order to prevent such situation, our company may accept all the mistakes or problems as well as they encourage us to openly share such issues with others. This kind of environment may be one of the stimulators for me to share everything.” (ElecCo-INT5)
Therefore, the company’s tolerance to the members’ failures and mistakes would be one of crucial factors, to cultivate positive culture to encourage knowledge sharing in the project-based organisations.

5.4.2.2 Free communication

‘Free communication’ aspect is considered one of the significant elements that would be a potential facilitating component for encouraging knowledge sharing in the project-based organisations.

The interview participants indicated that communication with others in a variety of ways such as face-to-face, emails, and traditional mails is one of the important enabling factors to share knowledge with others in the team or company. Although the methods of communication are important, the more crucial factor is how they are contacting others. That is, freely communicating with others regardless of hierarchical levels would be more important than which methods they are using for sharing knowledge. By such free communicating with others, good quality of knowledge and information would be produced and circulated around all the members in the project team. One of the interview participants explained that communication regardless of boundaries and stratums might have originated from the organisational culture. For example, he revealed that knowledge is one of the main products in recent years and growing number of companies highlights its role and sharing it within the members. In order to encourage members, they are trying to cultivate free a communication climate. The operational manager at the financial company (FinCo-INT9) explained the significant role of communication in knowledge sharing as,

“Whatever the methods are, emails, face-to-face contacts etc., communication is very important for knowledge sharing. I think most of all of actions in knowledge sharing may be based on communication with others. If it is discontinued, it means stopping knowledge sharing.” (FinCo-INT9)

The tactical manager at the electronic company (ElecCo-INT1) also stated its importance and the role of free communication for improved knowledge sharing.
“All the opinions or knowledge should be collected from all levels regardless of the individuals’ position. Through this process, good quality of knowledge may be generated. Such processes are based on our corporate culture. I think such communication without boundaries is one of the very crucial factors to share one’s knowledge with others.” (ElecCo-INT1)

Hence, they suggested that in order to promote the members to share knowledge with others, the culture of free communication should be cultivated to the members in the project-based organisations.

5.4.2.3 Willingness to new comers or novices

‘Willingness to new comers or novices’ is one of meaningful elements of culture aspect of knowledge sharing which would play an important role for enhancing knowledge sharing in the project-based organisations.

The research informants stated that the organisational culture is the overall atmosphere or climate in the team or company that would influence directly or indirectly on the individual’s behavioural patterns. Members in an organisation may learn the culture by contacting and working with colleagues in a natural and unconscious manner. They indicated that the members’ attitudes towards the new comers would have a greater influence on determining the new comers behaviours. If the existing members are friendly, caring, and open-minded towards the newcomers, they would automatically be accepting the current climates, and feel more relaxed to participate in ongoing knowledge sharing activities in the project teams. In contrast, if the atmosphere were negative towards them, it would be difficult for the new members to be absorbed into the organisation.

The interviewees revealed that such positive and welcoming attitudes towards new members would also have a great impact on their behaviours of knowledge sharing. If the existing members were willing to open and share knowledge such as the project knowledge, basic information with regard to the company and so on, the newly entered persons would tend to participate or imitate knowledge sharing. For example, the
directing manager in the electronic company (ElecCo-INT3) stated the importance of such a welcoming culture during project execution.

“In our team, we have a welcoming culture to rookies. They may be very frightened and nervous in the new situation or environment. When the newbies enter or new faces join our project team, all of us are trying to give ours to them in order to make them easily become a member of our team. Such culture may be one of great powers to motivate people to imitate their colleagues’ behaviours.” (ElecCo-INT3)

The interview participants (ConCo1-INT2) who is the tactical manager in the construction company also highlighted the significance of warm culture to the newcomers.

“When we conduct projects, I think, the most important thing is how the members bond together, and how they are close together. These may be very important in dealing with unforeseeable difficulties during the projects. In order to make a positive working environment, the culture, which is open-minded to all members is crucial and important. For me, I think knowledge sharing is how much the individuals are willing to diverge my expertise to others.” (ConCo1-INT2)

In consequence, the informants suggested that the project team should raise their willingness to the new members in order to strengthen up knowledge sharing in the project-based organisations.

5.4.2.4 Accepting the diversity

‘Accepting the diversity’ is one of the important elements of the culture aspect of knowledge sharing, which would be an essential player for encouraging the members to participate in knowledge sharing in the project-based organisations.

The interview participants indicated that majority of the projects are carried out by members from diverse countries since the globalisation is pervasive in project-based organisations. They suggested that although diversity would be one of potential barriers to set up a unified decision to conduct projects, such diversity could be an impetus to generate a variety of ideas or knowledge during project execution. For example, the
informant (FinCo-INT7) who is the tactical manager in the financial company stated how the diverse cultural backgrounds would affect other members in the project team.

“For our team, multi-culturalism is one of the difficulties to share information and knowledge because of language differences and habitual differences. For example, our Taiwanese people and Korean have similar ways of behaviour but the westerners have slightly different habits. We are very shy to answer questions during the meeting or presentations but they do ask questions whenever they are stuck in difficult situations. For me, the western people’s behaviour is one of stimulating factors to become more active.” (FinCo-INT7)

The director of the construction management company (ConCo2-INT1) explained the recent situation of project execution and the significance of cultural diversity for knowledge sharing.

“Compared to the past construction projects in 1970s and 1980s, conducting projects recently are quite different from old construction works. While we deployed all the project members from home countries in the past, currently we build up project teams in Korea with a small number of core persons. And then we will hire local experts and workers from the local market. There are pros and cons in such multi-national project teams. I think working in such a multi-countries team would be tougher, especially when we communicate and exchange information and knowledge. Despite such difficulties, we accept the local culture and diversity when we share knowledge and information.” (ConC2o-INT1)

Therefore, they implied that accepting the diversity based on comprehending others would be one of the potential facilitators to promote knowledge sharing in the project-based organisations.

5.4.2.5 Fostering the less competitive atmosphere

‘Fostering the less competitive atmosphere’ is one of the important elements of culture aspect of knowledge sharing that would be an essential facilitator for the members to take part in knowledge sharing in the project-based organisations.
The research informants point out that one of the main causes of not sharing knowledge with others in the project team may be harsh competition between the members. They explained that in some cases, the project-team members would consider co-workers as potential competitors rather than colleagues or partners to break through difficulties. According to the informants, in order to yield maximised outcomes from the employees, the firm created a competitive atmosphere in the company. Such a negative climate of the company would be one of the probable interfering forces to share, transfer or exchange one’s information or knowledge with others. They proposed that in order to nurture the sharing knowledge culture in the firm, the management should alleviate the fierce competition against the members. For instance, the tactical manager (FinCo.INT1) responded and gave his views on the reasons for not sharing knowledge in a direct manner without any hesitation as follows,

“Competition. It makes me not sharing my knowledge with others.” (FinCo.INT1)

His short comment reflected on the individuals’ antagonistic feeling towards competition in his team. In addition, another tactical manager (FinCo.INT7) in the financial company also presented his impressions of knowledge sharing and competition.

“It's probably competition. I think one of the main barriers of knowledge sharing is harsh competition. It is too severe to compete with others in the company. Why the company asks us to share knowledge even the overall environment is too harsh? How can I share mine under this situation?” (FinCo.INT7)

Likewise, another tactical manager in the financial company (FinCo.INT12) also mentioned the importance of less competitive atmosphere for knowledge sharing.

“If people are very competitive, under this circumstance, and they don’t have a good relationship with others and they can’t expect to share knowledge with others. But when gathering with very good people, and where people are very open, I don't think there’s going to be many problems in there.” (FinCo.INT12)
The interviewee (FinCo-INT9) who is in charge of the operational manager in the financial company stated the important influence of reduced competition on knowledge sharing.

“Definitely, competition is unavoidable in the present moment. And definitely harsh competition will make it difficult for us to share knowledge with others. And definitely the management has to cope with this situation if they want to proliferate knowledge sharing in the firm.” (FinCo-INT9)

Therefore, the informants recommended that reducing the competitive atmosphere in the project teams would be one of potential motivators for promoting the project-members engaging in knowledge sharing.

5.4.3 The remunerating category

There are two concepts in this category: physical remuneration, and psychological remuneration. The research informants suggested that rewards contingent on the targeted behaviours would be one of the fastest and most efficient approaches to accomplish the goal. They stated that the project team would expect such positive consequences with using the appropriate remuneration scheme for promoting knowledge sharing. The following section of this sub-chapter deals with the details of each concept of remunerating category.

5.4.3.1 Physical remuneration

‘Physical remuneration’ is one of the significant elements of the remunerating aspect of knowledge sharing which would play a powerful facilitator for encouraging knowledge sharing in the project-based organisations.

The interview participants indicated that the physical remuneration such as bonus, rewards, or promotion would be one of the promptest prescriptions to make the employees carry out the target behaviours. Some of the interviewees commented that the success of knowledge sharing in project teams would be dependent upon the appropriate reimbursement of their endeavours. Moreover, they asserted that the physical
remuneration is very much like a double-edged sword so management would have to be cautious when utilising this scheme. Through this, the company would attain the expected consequences (i.e. enhanced and prevalence of knowledge sharing) for a moment. However, the results may drop if they suggest a higher level of rewards contingent on the employees’ actions. Moreover, some of the informants mentioned that in order to lead the maximised consequence from the monetary rewards, the team-based assessment on knowledge sharing had been better than the individual-based one. Thus, they implied that although the physical remuneration, especially monetary rewards, and promotions would be an efficient way to encourage members to participate in knowledge sharing, management should be cautious of the over-reliance on it. For example, the director of the construction company (ConCo2-INT1) showed that the effectiveness of rewards for one’s knowledge sharing in his company.

“In my company, we are counting the members posts on the intranet. We’ve compensated their effort on incentives. So far, it is very useful.” (ConCo2-INT1)

The tactical manager in the electronic company (ElecCo-INT5) explained how the reward is effective to change one’s behaviour in his organisations.

“One of the most handy and effective ways to motivate the employees may be monetary reward. I think, with the employees’ point of view, receiving the bonus or incentives will be a direct method in influencing on their behaviours, because one of the purpose to work for the company is earning money.” (ElecCo-INT5)

In addition, the interview participant (ElecCo-INT5) also suggested the example that his company is running for the remuneration of each member’s knowledge sharing deed.

“In my company, we are running a web-based free board called on ‘idea bank’. In this web page, anyone in the company can suggest anything in terms work-related matters. We can freely share our knowledge, information, or know-how regardless of hierarchical level or divisions. And the company is also checking and marking the board and grant a prize for the person who contributed most frequently and added the most valuable information. Such reward, for me, one of motivators to take part in the knowledge sharing system. I think it is very useful to us.” (ElecCo-INT5)
The interviewee (FinCo-INT6) who is the tactical manager in the financial company also pointed out the significance of remuneration which is contingent on one’s behaviours.

“One of the aspects of how you’re, I suppose ranked and remunerated is the performance of your teams and the development of your staff and things like that. I have said building in enough reward and recognition and remuneration around people who’d go to the extra mile.” (FinCo-INT6)

Whilst one of the operational managers in the financial company (FinCo-INT14) who has the similar point of view with the aforementioned interview participant, he indicated the importance of team level assessments for knowledge sharing.

“I think monetary reward in information sharing will be one of the efficient ways to motivate people. However, the bonus contingent on the individuals’ performance will not be very useful. Bonus should be given based on the assessment of the team’s performance level.” (FinCo-INT14)

5.4.3.2 Psychological remuneration

‘Psychological remuneration’ is one of the meaningful elements of the remuneration aspect of knowledge sharing, which would be an essential player for encouraging members to participate in knowledge sharing in the project-based organisations.

The interview participants agreed that there was an instant and great response to monetary rewards, incentives, and promotion. However, they commented that there could be a detrimental effect of utilising this type of commendation. They explained that while physical rewards would be effective, and productive to make the members participate in knowledge sharing in the beginning stage of implementing rewards, the ultimate purpose of knowledge sharing might be reversed at last. That is, the company would utilise such methods for knowledge sharing but the employees might pursue the rewards or incentives rather than sharing knowledge. Moreover, some of the informants expressed that because human beings are pursuing the higher level of needs such as esteem, achievement, status, reputation or personal growth, higher level of motivations would be more powerful and influential than physical motivators. For example, one of the tactical
managers in the construction company (ConCo1-INT2) explained his reasons for sharing knowledge as the recognition by others.

“For our company, the company confer the title of ‘Mast in the field’ to whom has the highest knowledge and skills in certain fields. I think if I were conferred the title and a lot of people admired me, it would be a very honourable event for me to share my knowledge. And if anyone who takes my knowledge and achieve his skill development and has sorted out the difficulties in the construction site, I think it would be much better than receiving a hundred pound bank note. That is, the mental rewards which I am recognised as an expert by colleagues or my seniors, is a far greater impact on motivating me to do something.” (ConCo1-INT2)

The informant (FinCo-INT9) who is a tactical manager in the financial company had a similar point of view with ConCo1-INT2 in the construction company.

“This story isn’t relevant to my current company but it is my previous company’s story. The general manager of the firm used to hold a regular conference once a month for announcing the company’s achievements and each team’s progresses to the public. During this gathering, the manager granted a prize to the best team with a certificate and small gifts such as a bottle of champagne or a cake. At that time, I was very jealous of them because I was envious of the gift but I was desirous of the title and others’ recognition. Such thing was a very powerful driving force. This is why human beings are different from animals.” (FinCo-INT9)

In addition, the director of the construction management company (ConCo2-INT2) emphasised the significant role of psychological rewards rather than the physical ones.

“When I initiate a bonus or incentive scheme in order for the employees to do something, the influence of this plan is usually presented shortly after announcing it. However, if they are stimulated constantly by money or promotion, they will think it as a proper thing and they will be under the chronic situation. Under this circumstance, such a plan wouldn’t play the suitable role. This is the main reason why I am very careful of utilising such physical rewards. For me, I am trying to change their minds etc. For example, I try to go to picnics regularly or have a
Hence, it could be implied that in order to motivate the members to share knowledge with others, the company should concentrate on higher values of psychological remuneration such as recognition, esteem, or achievement.

5.5 The self-efficacy core category

The core category of self-efficacy composes of three categories, which are modelling, experiencing, and persuasion. The research informants indicated that self-efficacy would be an important factor for one to determine to give one’s knowledge to others. Principally, self-efficacy means one’s belief that he or she can do certain goals and it is one of significant affecting factors of human behaviours. Each of their concepts in the categories is described in the following section.

5.5.1 Modelling

There are three concepts in this category: self-confidence, becoming an example to others, and being proud of one’s company. In order to create self-efficacy for knowledge sharing, the research informants suggested that they have to become an example to others to follow their behaviours such as knowledge sharing or knowledge exchange in the project teams. That is, when members in a project team implement the feeling that ‘if one can do it, I can do it as well’, others would participate in knowledge sharing. The following section of this sub-chapter dealt with the details of each concept of the modelling category.

5.5.1.1 Self-confidence

‘Self-confidence’ is one of the significant elements regarding ‘modelling’ aspect, which would be a potential facilitating component of self-efficacy for encouraging knowledge sharing in the project-based organisations.

The research informants indicated that they do not care about sharing any kind of knowledge to others since the knowledge would be difficult to imitate and present as the
original knowledge holder. Most of the informants explained that knowledge is a synthesis of existing knowledge or information with one’s own ideas or insights. Whilst the prevailed knowledge could possibly be reconstructed by anyone who can assess the information or knowledge, one’s insights or unique ideas would be difficult to imitate perfectly same as the original ones. Moreover, they claimed that one of the most generic features of knowledge is tacitness. In other words, knowledge resides in the individuals’ brain and it would not be easy to rebuild by others. According to the interviewees, such unique characteristics of knowledge make them to share their knowledge with others without fear or hesitance of loss one’s competiveness. For example, the informant (FinCo-INT1) who is the tactical manager in the financial company expressed as,

“Why share? It’s my professionalism. I think my own knowledge and know-how are somewhat, or completely different from others. That is, why I have accumulated such knowledge and know-how since I stared my job. And these are unique and some of them are difficult to convert into documents. In other words, my knowledge is a combination of existing knowledge and my own insight and know-how. When I transfer my knowledge to others, one would be possible to imitate or reconstruct the common part of the knowledge but he or she would find it difficult or might be impossible to copy it as it were in my head. That is one of my reasons to share any kind of knowledge to others without any hesitance.”

(FinCo-INT1)

The tactical manager (ElecCo-INT5) at the electronic company also pointed out that the unique nature of knowledge makes him more confident to share his own knowledge or ideas with others in his project team members.

“The knowledge seeker or knowledge receiver will have to reconstruct or imitate others’ knowledge. However, I think it is impossible to generate 100 per cent the same as the owner’s knowledge. In my opinion, knowledge is in one’s brain and it cannot be extracted completely same knowledge from the brains. I think, this gives us a very important point. I mean, even if I share or give my knowledge to others, they may be a possibly to mimic the original one but can’t compose it perfectly. As I work as a project manager or project coordinator, I have experienced myriad of difficulties. And I have my own solutions to deal with such situations. Sometimes, newbies come and ask me how to deal with such situations
because I have heard someone tell me that you have experience in similar situations. Normally, I give all the information that I know, but he can’t sort it out properly. Why? I have my own solutions and know-how which no one can copy and paste the same as I do.” (ElecCo-INT5)

5.5.1.2 Becoming an example to others

‘Becoming an example to others’ is one of the essential elements of the modelling aspect of knowledge sharing which would be an essential player for promoting project members to engage in knowledge sharing.

The research informants indicated that one of the important points to promote the other members to take part in knowledge sharing would be illustrating the target behaviours. They asserted that most of the members in the project teams have not experienced the positive outcomes with using knowledge sharing. One of the most efficient ways to make them participate in knowledge sharing is that some of the members in the team engage in certain target behaviours as leading by examples. When they experience the constructive incidents towards knowledge sharing, they might start to share their knowledge in response as reactions. For example, the informant (FinCon-INT7), who is one of the operational managers and the leader of the project team, explained how he made his team members engage in knowledge sharing with others in his team.

“I, personally, do something in advance. At the moment, I am the supervisor of the team. Whatever the actions are normally, I have to adopt and do it firstly. Knowledge sharing is in a similar vein. In my team, I encourage my team members to share and exchange knowledge or ideas with others. In order to succeed, the supervisor or the head must do it first. I have shared my knowledge with our team members and then they would share their knowledge.” (FinCon-INT7)

Likewise, another tactical manager (FinCo-INT12) in the financial company also stressed the significance of becoming an example to others.

“For me, prior to ordering something, I engage in the certain work in advance. As I, myself do it first, lots of my team members or colleagues will glance at me
and they will feel that my behaviour is useful in improving our work etc. I think knowledge sharing will be carried out in the same manner. The upper position staff do it in advance as an example and then the others will follow their behaviours.” (FinCo-INT12)

5.5.1.3 Being proud of oneself

‘Being proud of oneself’ is one of the meaningful elements of the modelling aspect in knowledge sharing, which would have an important role in stimulating knowledge sharing in the project-based organisations.

The informants pointed out that knowledge sharing would take place in organisations, when the members are proud of themselves and their company. They described that when the members in the project team are in a state with full of confidence and pride, they would be more willing to share knowledge compared to the less confident members. Moreover, they expressed that such pride is not only the basis of sharing knowledge, but also a potential motivating factor of the employees. In short, the personnel who are proud of oneself and one’s company would be more contributing to share knowledge as well as be the potential sources of the firm’s competitive advantage. The senior directing manager (ElecCo-INT3) in the electronic company stated how the pride of oneself would influence on one’s knowledge sharing behaviour.

“I am thinking that my company is one of the top-rated electronic companies. And the products of our company are also the best in the world. Moreover, I think the created knowledge in our company also is the best all around the world. Such pride makes us be competitive, therefore all our members will be willing to share our knowledge to others.” (ElecCo-INT3)

The directing manager in the construction company (ConCo2-INT1) expressed his perceptions of knowledge sharing and pride of his company towards knowledge sharing.

“I think my company is a pioneer of construction management in South Korea. We are one of the most leading construction management companies in South Korea and nobody can overtake our knowledge and know-how. As I am the
5.5.2 Experiencing

There are two concepts in this category: adopting, and personal experiences. In order for one to feel that he or she is capable of conducting their certain goals, one would have to experience with using various methods such as adopting others’ ways or constantly trying to find out the best ways for oneself. The interview participants suggested that one of the problems in terms of knowledge sharing is that the members have not experienced its benefit and usefulness. The following section of this sub-chapter dealt with the details of each concept of experiencing category.

5.5.2.1 Adopting

‘Adopting’ aspect is considered as one of the significant elements that would be a potential facilitating component for encouraging knowledge sharing in the project-based organisations.

The research informants asserted that one of the problems in terms of knowledge management, and knowledge sharing would be not have experienced its benefits and usefulness. That is, lots of members in the organisation have already known or heard about knowledge management and knowledge sharing. Yet, some of them treated knowledge sharing or any relevant activities as ‘non-of my business’ or not relevant to their team or company. Such atmosphere would make sharing knowledge between the members difficult to cultivate or encourage in the entire companies. The research interview participants claimed that eradicating those passive climates in the teams and adopting the good examples (i.e. In this study, knowledge sharing) would be one of the meaningful starting points of knowledge sharing. For example, the director in the construction management company (ConCo2-INT1) showed the difficulties in initiating knowledge management activities in his company.

“One of the most pervasive difficulties of knowledge management is that they haven’t used it before but they criticise its usefulness and value. But once you experience its huge impacts, you will continue to use it. When I implemented
knowledge management in my company, it was so difficult to encourage my team members to take part in. however, once it was settled down, lots of people were very happy with sharing ideas.” (ConCo2-INT1)

The director of the construction management company (ConCo2-INT1) also described the important role of implementing knowledge management and its relevant activities in the organisation.

“One of the barriers to sharing knowledge with others is that everyone has not tried to do it. Strictly speaking, there are so many similar activities with knowledge sharing and we didn’t recognise that our behaviours are a kind of knowledge sharing activities. People normally tend to move away from new things or not becoming familiar with things. Whoever starts to share knowledge and then the results are positive. Then, lots of people will automatically share knowledge with others.” (ConCo2-INT1)

5.5.2.2 Personal experiences

‘Personal experiences’ aspect is one of the meaningful elements, which would have an influence on the members’ experience of knowledge sharing in the project-based organisations.

The research informants stated that they have shared knowledge with others informally and they have constructed their own ways of knowledge sharing between the team members, or the others in different departments or divisions. They emphasised that knowledge sharing would be more useful and produce more fruitful consequences under the circumstances which the knowledge owners and the receivers engage in exchanging with their own ways. That is, the imposed or pre-constructed ways of knowledge sharing would arouse the employees’ adverse reactions or reluctance to take part in such good virtue. In order to reach the successful state of knowledge sharing in the project teams, the management would offer lots of opportunities to exchange knowledge with others rather than imposing or leading them to do that. In the collected data, a number of the interviewees have not recognised that his or her actions lead to knowledge sharing. Moreover, these informants have tried various ways of knowledge sharing or exchanging
with other members. For example, the operational manager at the financial company (FinCo-INT3) has her own way of knowledge sharing with members in the team.

“I frequently have a small group meeting with close colleagues. Is this activity a kind of knowledge sharing? Initially, I have a chat with my friends in the company and then I develop this regularly. It is an informal meeting but it is really useful for me and the members to share ideas and grasp what is happening in the company.” (FinCo-INT3)

Likewise, the operational manager (FinCo-INT14) in the financial company also stated the role of their personal experience with respect to knowledge sharing.

“One of potential barriers in terms of knowledge sharing is the people’s preconception to it. Some of the people may blame it without experiencing it. One may make their own method of knowledge sharing as they have experienced it.” (FinCo-INT14)

The directing manager in the construction management company highlighted the importance of own experience on knowledge sharing.

“Why is it difficult? I think they don’t have any experience of it. People may think and are directed by their emotions. For me, when I initially encounter the word sharing, I feel like it is losing mine.” (ConCo-INT1)

Some of the research participants also showed that vicarious experience of knowledge sharing would be one of useful approaches to enhance the individuals’ self-efficacy. They underlined that the direct experience would be one of the most powerful sources for knowledge sharing but one would not be able to experience all the things happened in the firm. In order to overcome such difficulty, the informants suggested the indirect experience such as the other members’ mentoring, storytelling would be one of potential facilitating elements for enhanced knowledge sharing in the project-based organisations. For example, the directing manager at the construction management company (ConCo2-INT2), stated the important role of indirect experience.
“One can’t experience all the happenings on the earth. So we have read a lot of books and we are educated by experts or specialists. The most efficient way will be through direct experience and he or she will feel that it would be useful to one’s work. Knowledge sharing may be in a similar vein. I think most of the members in my company haven’t experienced it before. So I or other seniors will tell them the stories of knowledge sharing and then they will experience it indirectly.” (ConCo2-INT2)

5.5.3 Persuasion

There is one concept in this category: encouraged. It is commonly mentioned that in order for the members in the organisations to become confident in conducting their goals, encouragement or discouragement would have a significant impact on one’s behaviours. In this research, the research informants stated that encouraged personnel would be more likely to engage in knowledge sharing. The following sub-section discussed the details of it in further.

5.5.3.1 Encouraged

The research informants showed that the performance of encouraged personnel would be far greater than the non-encouraged members in the teams. They asserted that encouragement would be a useful catalyst to encourage members to engage in knowledge sharing. Levying knowledge sharing as a compulsory task, would lead an unexpected negative result. In order to prevent from the members’ hostility, the research participant recommended that encouragement could be one of the greater vehicles to move the employees’ mind. The operational manager in the financial company (FinCo-INT10) explained how his team is encouraging staff to seek the knowledge.

“They encourage people to open communication and just if you have a question to other departments, you will have to ask them directly. I think the company encourages us more likely to go straight to the person and encourage us to share information with others as much as we can. This kind of encouragement may be one of the good deeds. Those who are encouraged personnel will also persuade or encourage the others to participate in knowledge sharing.” (FinCo-INT10)
The operational manager in the financial company (FinCo-INT4) stated the significance of convincing the employees.

“Don’t try to make them to change everything at once. Stay and wait for them to feel like that it is useful and required. Company life is different from the military service so you should not try to convince them rather to order.” (FinCo-INT4)

5.6 Cross-case comparisons

The cross-case comparisons were firstly summarised in Table 5.1, Table 5.2, Table 5.3, and Table 5.4.

5.6.1 Trust

All of the companies in this research had emphasised the importance of trust between the members for enhancing knowledge sharing in the project-based organisations.

Especially, all the participating firms had a great concern regarding ‘securing’ category in trust core category. The participating companies had also indicated the significance of ‘good quality of the shared knowledge’. All the interview participating companies have their own knowledge management systems as well as their knowledge sharing strategies which are based on the established systems. Most of the knowledge management systems were supported by information and communication technology. It is not surprising that the emphasis of the importance of information and communication technology for enhancing knowledge sharing in the recent years. As indicated in FinCo, discerning and categorising the knowledge, which might be required and used in the firm would make the employees to engage in utilising the company-wide system for sharing knowledge with other members. Furthermore, in order for the members to foster participating in knowledge sharing, the company would not accumulate vast amount of knowledge and information but should classify it into useable and manageable pieces.

There were vast amounts of similarities in relation to the securing category between ElecCo and FinCo. These similarities may be arisen from similar working environments and resources. That is, the participating two companies could be called as knowledge-intensive companies (e.g. FinCo, and ElecCo). Even though the first case, ElecCo,
manufactures lots of electric devices, these products are mainly developed from its research and development centres. Similarly, the informants in FinCo stressed the importance of securing issues as well, since its main business products are intellectual assets from human resources. On the other hand, the third type of company (i.e. ConCo1, 2, and 3), deals with relatively a low amount of intellectual products comparing with the other two companies. Due to these reasons, the informants’ perceptions regarding the ‘securing category’ in ConCos is relatively lower than ElecCo, and FinCo. In particular, the participating companies had highlighted that ‘Free-riders’ would deteriorate the members’ behaviours of knowledge sharing so it would have to be eliminated by all the members in the organisation.

There were also a number of commonalities with respect to ‘affiliation category’ of trust core category. In this research, the affiliation was considered as the symbol of trust between the members. Although there were several similarities and commonalities with regard to ‘securing category’ between ElecCo and FinCo, all five firms have almost similar points of views towards the ‘affiliation category’. Especially, the proximity with others may be one of the most significant concepts of affiliation from the five participating companies. This could be because of the physical and psychological closeness amongst the members and would make them more open-minded and to be willing to offer one’s valuables to others. Such proximity with others is emphasised in other research areas such as interior design, furniture design, sociology etc.

In addition, ‘supporting’ was also a significant influencer for enhancing knowledge sharing between the members in the project-based organisations. In particular, ‘management commitment’, and ‘technology’ were considered as important factors for the supporting category between all the companies. As mentioned in the previous paragraph, lots of informants had stressed the significance and the potential role of technology for knowledge sharing and knowledge management. For example, one of the most frequently referred was prevention of reinventing the wheel and attaining the sustainable competitive advantage within the firm.

Although there were many commonalities in terms of ‘securing’, ‘affiliation’, and ‘supporting’ category, there were few similarities with the category of ‘sharing’. In the context of ‘sharing core category’, sharing means not only distributing knowledge
literally but also sharing other higher values and information which would make
knowledge management and knowledge sharing more robust and vibrant. While the
findings from FinCo indicated that sharing visions and higher values would be one of
crucial determinants to create trust between the members, there was nothing in this
category from ElecCo, and ConCos. Despite of rare of commonalities between the
informants, FinCo and ConCos had a consensus on ‘clarifying the source category’.
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<tr>
<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
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<tr>
<td>Stability of the position</td>
<td>Guaranteed job position</td>
<td>• Sharing is losing one's competitiveness</td>
<td>• Good quality of the shared knowledge in the system</td>
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<td></td>
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<td>• Job security should be guaranteed</td>
<td>• Accumulating knowledge does not mean and guarantee the quality of sharing knowledge</td>
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<td>Not using one’s knowledge other purposes</td>
<td>Worry for the misuse of shared knowledge by others</td>
<td>• Misuse of the shared knowledge</td>
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<td>• Misuse it for the receiver's own sake</td>
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<tr>
<td>Good quality of the shared knowledge</td>
<td>• Quality of the knowledge in the knowledge management system</td>
<td>The information and knowledge are overloaded so categorization of the required knowledge in the company is required</td>
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<td>• Good quality of shared knowledge between the members</td>
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<td>Free-riders</td>
<td>Do not want to share knowledge with others who only take one's own benefits</td>
<td>• Not want to share knowledge with others whom endeavour noting</td>
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<td>• Not want to share knowledge with others who only take one’s own benefits</td>
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<td>• People are normally self-centric</td>
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<td>Reducing the competition</td>
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<td>• Competition makes knowledge sharing weaker</td>
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<td>• Knowledge means competitiveness against the others in the company</td>
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<td>Findings</td>
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<td>Vision sharing</td>
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<td>Clarifying the source</td>
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<tr>
<td>Communicating with others</td>
<td>Communication would enhance the knowledge sharing</td>
<td>Continuous and various communication with others for enhanced knowledge sharing</td>
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<tr>
<td>Reciprocity</td>
<td>Reciprocity and mutual trust are the fundamentals of knowledge sharing</td>
<td>Sharing is reciprocity and mutual transaction between the members</td>
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<td>Benevolence to others</td>
<td>One’s pleasure to help others</td>
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<td>Proximity with others</td>
<td>The more trustworthiness, the easier to share knowledge with the team members</td>
<td>Knowledge sharing is constant contacting so proximity with others is important</td>
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<td>Management commitment</td>
<td>Management decision would direct the overall direction of the company's activities. And knowledge sharing is a similar vein.</td>
<td>The CEO’s decision or commitment to knowledge management would be an important determinant of making it pervasive in the organisation.</td>
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In order to succeed in knowledge management and knowledge sharing, the long-term perspective is required and essential.

- Information and communication technology offers the members of the enhanced connectivity for better knowledge sharing.
- Technology is one of vehicles to overcome the geographical difficulty of knowledge sharing.
- Information and communication technology is an essential for today’s business environment but tailored or customized knowledge system is required for the enhanced knowledge sharing.

Information and communication technology make the enhanced accessibility of knowledge and knowledge management system but the security of the firm’s knowledge is more important than the accessibility of the information in the firm.

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<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuity</td>
<td>In order to succeed in knowledge management and knowledge sharing, the long-term perspective is required and essential.</td>
<td>• Information and communication technology offers the members of the enhanced connectivity for better knowledge sharing. • Technology is one of vehicles to overcome the geographical difficulty of knowledge sharing. • Information and communication technology is an essential for today’s business environment but tailored or customized knowledge system is required for the enhanced knowledge sharing.</td>
<td>Information and communication technology make the enhanced accessibility of knowledge and knowledge management system but the security of the firm’s knowledge is more important than the accessibility of the information in the firm.</td>
</tr>
</tbody>
</table>

Table 5.1 Cross-case comparisons of trust
5.6.2 Relationship

Although all of the participating companies had emphasised the significance of relationship for enhancing knowledge sharing in the project-based organisations, there were few commonalities in the relationship category compared to the other three core categories.

Despite of sparse commonalities in this core category, there were some common points of views in this theme. It was found that the category of ‘linking’ would be an essential element to enhance relationship for knowledge sharing from FinCo and ConCos. Particularly, these companies had similarities on the concepts of ‘meeting the members in various ways’, and ‘rapport building’. However, there were nothing of commonalities and similarities in terms of ‘linking category’ between ElecCo and other firms. It was surprising that even though the two firms, ElecCo and FinCo, are so-called knowledge-intensive companies, none of the similar points towards ‘linking’ category. This would be probably caused by the different composition of the project team members. That is, the project team member in ElecCo is designed with same demographic background personnel. On the other hand, FinCo has the project team members with diverse nationalities in a team. Since this reason, multinational team members might underline the more significant role of bonding together with other members in the team.

Moreover, the category of ‘understanding’ was considered as one of important factors for knowledge sharing by ElecCo and FinCo. Especially, the two companies had a similar point of view in terms of ‘horizontality’ which would be a crucial element in order to intensify the understanding for better knowledge sharing in the project-based organisations. This could be explained by the project team members’ age. That is, both ElecCo and FinCo have relatively younger members than ConCos. This age difference would make the members have a tendency to stress the importance of horizontality. Additionally, there was a similarity between FinCo and ConCos. Theses companies considered ‘training and educating the members’ as one of significant elements to increase the understanding for knowledge sharing. Since both companies stressed the importance of cost-efficiency and quick response to the employees, the commonality in terms of ‘training and educating the members’ might be quite natural to them.
While there were several commonalities in ‘linking’ and ‘understanding’ category, relatively scanty similarities were found in ‘membership’ category. Although each of the five involved companies stated variety of elements relevant to the ‘membership’ category, there were few commonalities. For example, the interview participants in ElecCo emphasised the significance of ‘human resource management’. On the other hand, ConCos considered ‘strategic alliance’ as the important factor for the ‘membership’ category. Despite of differences between the participating companies, there were some common points regarding ‘human resource management’ from ElecCo and FinCo. According to the mission statements from both firms, one of the highest values of the companies is ‘harmony between the members’. Probably, this virtue makes the employees consider ‘human resource management’ as one of significant elements in ‘relationship’ aspect of knowledge sharing in the project-based organisations.
<table>
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<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
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</table>
| Meeting the members in various ways | • Various ways of meeting would give more chances to exchange more knowledge with others  
• Informal meeting would be one of good opportunities to share knowledge with unexpected ways. | Knowledge sharing would be much easier with acquaintances rather strangers. Such relationship is based on the various meeting. |
| Rapport building       | • Relationship would affect the degree of knowledge sharing with the members  
• Personal rapport with others in one of sources for sharing knowledge.  
• Rapport is a potential source of specialised knowledge from them. | Building up a rapport is a potential source of getting the new knowledge from others. |
| Shifting the role or job rotation | • Job rotation would enhance the understanding of others for better knowledge sharing.  
• Job rotation is the basis of understanding others | | |
| Horizontality rather verticality | Flat structure is important to encourage knowledge sharing in the firm. | • Horizontal structure might be far more flexible when communicating with other members in the team.  
• Free communication is the fundamental of knowledge sharing and horizontality would offer free communication with others | |
### Findings

<table>
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<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
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</table>
| Training and educating the members | • Train the staff what the organisations is going on and the latest issues of the firm.  
• Educate the employees how to share knowledge                                      | Training is a cost-efficient ways of enhancing knowledge sharing in the firm. |                                                                       |
| Recruiting                               | • Members who have the certain level of knowledge make it easy to share knowledge with others  
• Who the colleagues are would be an important determinant for knowledge sharing |                                                                       |                                                                       |
| Strategic alliance                   |                                                                       | • Strategically ally with whom has the similar level of knowledge is one of ways to increase knowledge sharing  
• Partnership is one of important for enhanced knowledge sharing |                                                                       |
| Human resource management              | The assessing of one’s endeavour is important for enhancing knowledge sharing | Deploy the proper persons to the proper position would enhance knowledge sharing |                                                                       |

**Table 5.2 Cross-case comparisons of relationship**
5.6.3 Motivation

The informants’ points of view on motivation were vastly consistent across all the participating organisations and the interviewees. Majority of the findings suggested that motivated personnel would produce more fruitful outcomes in terms of knowledge sharing in the project-based organisations.

All of the involved organisations agreed that the ‘workload’ would be the potential motivator of knowledge sharing in the project-based organisations. Majority of the concepts in workload category had a uniform point of views from ElecCo, FinCo, and ConCos. In particular, all of the companies concurred that ‘overcoming the task inundation’ would potentially have a greater influence on the members’ behaviours towards knowledge sharing. In addition, ElecCo and FinCo had a similar point of view regarding the concept of ‘integrating tasks with the individuals’ tasks’, since it may be arisen from a similar nature of the companies (i.e. knowledge-intensive firms).

The interview participants from the five organisations had common opinions in terms of ‘remunerating’ category. It was found that large numbers of concepts had similarities amongst all the companies. In particular, each firm indicated that ‘physical remuneration’ would have a significant impact on motivating the members to engage in knowledge sharing between the members. Each company had different approaches for physical remuneration. Yet, the fundamental purpose of utilising it was in the same vein (i.e. fostering knowledge sharing). In addition, FinCo, and ConCos stressed not only the importance and its usability of ‘psychological remuneration’ but also its long-term viable effects of knowledge sharing.

Although ‘culture’ was considered as one of the important influencing factors for the individuals’ knowledge sharing behaviours by almost all of the informants, it was difficult to find the commonalities from the three participating companies. The researcher considered that the reason for such diversity of concepts could have been arisen from each company’s uniqueness and differences. It was distinctive for ElecCo that the interview participants regarded ‘tolerating failures and challenges’, and ‘willingness to the newcomers’. Unlikely to ElecCo, the interviewees in FinCo considered ‘fostering the less competitive culture’ as the foremost culture for enhancing knowledge sharing in the
firms. Moreover, the informants from ConCos thought that ‘accepting diversity’ would be one of the most influential cultures for promoting knowledge sharing. Despite such inconsistency of the culture aspect of motivation, there were some commonalities amongst all companies. It was found that in ElecCo and FinCo the culture of ‘changing one’s perception’ would be a potential motivator. The harsh atmosphere of the firm, which means competition is pervasive in both firms, would be the cause of this perception. The interviews of ConCos and FinCo had similarities in terms of ‘accepting the diversity’. It seems that both ConCos and FinCo are prevailed the composition of multinational project team members so the diversity would be considered one of important elements to enhance or interfere knowledge sharing in the firms.
<table>
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<tr>
<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
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<tbody>
<tr>
<td><strong>Overcoming the task inundation</strong></td>
<td>Employees are too busy to engage in formal share knowledge activities.</td>
<td>• Do not want to spend extra time for knowledge sharing</td>
<td>The employees think that it is an additional task.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduced work will become a potential motivator of knowledge sharing</td>
<td></td>
</tr>
<tr>
<td><strong>Integration with the individuals’ tasks</strong></td>
<td>Do not become an extra task</td>
<td>• Knowledge sharing should be a part of routine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Integration with the daily tasks.</td>
<td></td>
</tr>
<tr>
<td><strong>Changing the one’s perception</strong></td>
<td>People’s perception will be a crucial determinant of knowledge sharing and the quality of the shared knowledge.</td>
<td>• Self-motivation is important</td>
<td>• Changing one’s mind is crucial</td>
</tr>
<tr>
<td><strong>Tolerating the failures and challenges</strong></td>
<td>• Tolerating of failures makes the employees to share knowledge more actively.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hiding would make it worse so people normally share knowledge with others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Free communication</strong></td>
<td>All the knowledge is important and it should be shared by communication</td>
<td>Whatever the communication methods is, freely communicating with others is important for motivating the members to engage in sharing knowledge</td>
<td></td>
</tr>
<tr>
<td>Findings</td>
<td>ElecCo</td>
<td>FinCo</td>
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</tr>
<tr>
<td>Williness to the newcomers</td>
<td>In order for new members to get used to sharing knowledge, other members should take part in knowledge sharing in advance.</td>
<td>Cultural diversity might be a potential difficulty but it could be useful when it comes to the multinational team projects</td>
<td>Multinational projects are pervasive and the understanding and accepting the cultural diversity are significant for promoting knowledge sharing</td>
</tr>
<tr>
<td>Accepting the diversity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fostering the less competitive atmosphere</td>
<td></td>
<td>• Competition is a main barrier of knowledge sharing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Severe competition makes it difficult to share knowledge with others in the project teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Competition would make it worse other influencing factors of knowledge sharing. And it should be lessened.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Competition is inevitable but for better knowledge sharing, it should be reduced.</td>
<td></td>
</tr>
<tr>
<td>Findings</td>
<td>ElecCo</td>
<td>FinCo</td>
<td>ConCos</td>
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<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Physical remuneration</td>
<td>• Monetary reward is a handy way to enhance knowledge.</td>
<td>• Team-based remuneration is an influential approach to promote knowledge sharing</td>
<td>Monetary reward is a very efficient ways to promote knowledge sharing in the firm.</td>
</tr>
<tr>
<td></td>
<td>• Sharing knowledge contingent on their endeavour is one of good ways to promote it.</td>
<td>• Team level reward is an effective ways to enhance knowledge sharing</td>
<td></td>
</tr>
<tr>
<td>Psychological remuneration</td>
<td></td>
<td>Honour is one of good motivators</td>
<td>• Recognised by others is one of good motivators for sharing knowledge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Monetary reward is a prompt way but short-lived. For the long-term, psychological reward is required.</td>
</tr>
</tbody>
</table>
5.6.4 Self-efficacy

Although each of the participating companies had indicated the significance of self-efficacy for enhanced knowledge sharing in the project-based organisations, it was hardly to find the common point of views in terms of this category.

As for the first category of self-efficacy is ‘modelling’, there were commonalities in terms of ‘self-confidence’ and ‘being proud of oneself’ from ElecCo and FinCo, and ElecCo and ConCos respectively. It was found from the two companies, ElecCo and FinCo, that knowledge might be difficult to imitate perfectly, so this would make it possible to be confident of knowledge sharing with others. Furthermore, the interviewees in FinCo and ConCos showed the similarities, which the pride of oneself and the company would be the potentially important for growing ‘self-efficacy’ for enhancing knowledge sharing in the project-based organisations. While the two concepts of ‘self-confidence’ and ‘being proud oneself’ had the similar point of views among the different companies, the only one company, FinCo, showed ‘becoming an example’ as one of significant factors of modelling category.

There were also few common points of views in terms of the experiencing category. Yet, the interview participants from FinCo and ConCos suggested similar viewpoints in terms of ‘personal experience’ concept. They pointed out that ‘the perceptions of being capable of doing something’ or ‘recognising the usefulness of knowledge sharing by doing oneself’ would be one of essential factors of experiencing category for enhancing knowledge sharing in the project-based organisations. Moreover, the participants in ConCos stated that once applying knowledge sharing or similar activities in the company and then they would identify its value. In particular, the interviewees from ConCos stated lots of things relevant to ‘self-efficacy’ since it might be arisen from its nature which there are frequent face-to-face contacts with others to transfer the individuals’ skills in the construction sites. Moreover, FinCo also considered ‘self-efficacy’ because it probably came from its business units’ frequent contact with the other members in the team.

Lastly, FinCo stressed the significance of ‘persuasion’ for enhancing self-efficacy in knowledge sharing. They stated that the unilateral ordering system would make it worse
and change peoples’ intentions and behaviours towards knowledge sharing. In order to overcome such difficulties in the team, one should persuade its viability and usefulness rather than directing or ordering.
<table>
<thead>
<tr>
<th>Findings</th>
<th>ElecCo</th>
<th>FinCo</th>
<th>ConCos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-confidence</td>
<td>Own knowledge is difficult to imitate perfectly same as one's own</td>
<td>Professionalism, that is one's confidence regarding own knowledge</td>
<td></td>
</tr>
<tr>
<td>Becoming and example</td>
<td>• Do it in advance before others do. Sharing knowledge in advance for becoming an example to others. • Not ordering but doing it in advance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being proud of oneself</td>
<td>Being proud of the company and knowledge make the members being confident of knowledge.</td>
<td></td>
<td>The company is a dominant entity and to spread knowledge is honourable</td>
</tr>
<tr>
<td>Adopting</td>
<td></td>
<td>• Adopting and using knowledge sharing prior to blaming its usefulness • People are very cautious of adopting the new thing</td>
<td></td>
</tr>
<tr>
<td>Trials and errors</td>
<td>• Spontaneously initiated knowledge sharing and then it became the collective action which is supported by the company • Blaming without any experience</td>
<td>• Not experienced it before and judge its usefulness based on one's own perceptions • Indirect experience would be another example of experiencing it</td>
<td></td>
</tr>
<tr>
<td>Encouraged</td>
<td>The encouraged persons will be easier to apply knowledge sharing Not to do that in once but slowly and steady to engage in knowledge sharing by convincing them</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.4 Cross-case comparisons of self-efficacy
5.6.5 Summary of cross-case comparisons

The comprehensive cross-case analysis, which compared similarities and differences amongst the research involved five firms, was conducted in order to offer the opportunity to show what features of the conceptual model are significant and distinctive from the involved organisations.

The comparative analysis showed that trust is more influential than the other core categories such as relationship, motivation, and self-efficacy in the five companies. Based on the comparative analysis, trust would be the fundamental factor of enhancing knowledge sharing in the project-based organisations. In order to cultivate trust between the members in the project-team, the five participated companies suggested that ‘securing’, and ‘supporting’ were the top-ranked elements for intensifying the interpersonal trust in the project teams. The cross-case analysis findings in trust core category also indicated that associating with trustworthy members would heighten the mutual trust between the members in the project teams.

In addition, motivation is also a prominent element to intensify knowledge sharing across the investigated companies. The cross case comparison on motivation core category indicated that workload is one of the dominant motivations among the five companies (i.e. reduced workload and integration of knowledge sharing with the daily tasks); and physical remuneration (e.g. monetary reward, bonus etc.) is commonly mentioned across the involved firms. While lots of informants in this research stressed the significance of culture as a potential motivator of knowledge sharing, few common points of views were discovered during the cross-case comparisons.

While those two aforementioned core categories (i.e. trust and motivation) had a number of similarities and commonalities amongst three involved organisations, the remaining two core categories (i.e. relationship, and self-efficacy) showed little likeness between them. That is, it was easy to find similarities and commonalities in the core categories of trust and motivation. However, it was difficult to discover similarities and commonalities in the core categories of relationship and self-efficacy. Across the companies, relationship had a significant role to enhance the members knowledge sharing. In particular, the concepts of linking and understanding were considered as the most
common across the firms. The concept of human resource management in the membership category was a common idea shared by the interview participants. Lastly, the informants stated and recognised the important role of self-efficacy for enhancing knowledge sharing but the concepts in this core category varied from company to company in this study. Despite of such variable of opinions, there were some commonalities in the concept of self-confidence, and personal experience.

5.7 Relationships between the concepts of the conceptual model

Based on the data analysis, all the core categories are closely inter-related for enhanced knowledge sharing in the project-based organisations. Likewise, each concept of the core categories is interrelated to other concepts in the different core categories. That is, one concept would not solely play an influencer on promoting knowledge sharing but they are closely interconnected with each other as shown in Figure 5.1.

First of all, it was found that the core category of trust is the most significant one, which would enormously influence all three core categories (relationship, motivation, and self-efficacy). In addition, all the concepts of trust would influence upon all the concepts of relationship and self-efficacy. Despite of significant impact of trust towards other concepts, the influence of trust to motivation is relatively weaker than others. Especially, the concept of securing in trust would significantly affect the concepts of understanding, and membership in relationship as well as it would impact upon workload in motivation. Furthermore, the concept of affiliation would have an influence upon all the concepts of relationship.

It was also found that all the concepts of relationship would be enormously influenced by the concepts of trust as well as this would impact on all the concepts of self-efficacy. In addition, some of the concepts of relationship would affect the concepts of motivation core category. For instance, the emerged concepts in linking and understanding categories of relationship would intensify the concepts of affiliation and proximity in trust core category. Likewise, the concept of understanding would have a crucial impact on all the concept of affiliation in the trust core category.
It was a surprising finding that the influence of motivation to other concepts was relatively weaker, while the concepts of motivation would be affected by other concepts in trust, relationship and self-efficacy. The concepts of self-efficacy would have an impact on other concepts in relationship and motivation. It is widely accepted that self-efficacy is one of the robust promoters for people to engage in the certain behaviour. In this research, this common finding would be applicable for encouraging knowledge sharing in the project-based organisations. Especially, the concepts in modelling category would have a greater influence on the concepts of psychological remuneration in the motivation core category.

Figure 5.1 The relationship among core categories
5.8 Summary

In this chapter, the analysis of the research data has been conducted comprehensively. The concepts of the conceptual model have been explained based on the core categories and the categories.

The data described in this chapter shows that the behaviour of knowledge sharing is based on the trust between the project team members, which is endorsed through relationship with them. Since knowledge sharing may be a form of trades between the members, the role of trust is significant to create the fundamental of this kind of exchange among them. Unlikely to the economic exchange in the market, trust could be considered as the basic currency of the exchange in knowledge sharing. In addition, the relationship between the members would play a significant intervening factor which would make it possible for the members to determine to participate in knowledge sharing. Such relationship that is established on the grounds of mutual trust would create their own membership and strategic alliance to contribute valuable intellectual assets in order to maintain and acquire competitive advantages against the competitors.

In addition, the individual’s decision to share knowledge is strongly influenced by three broad motivating factors: workload, culture and remuneration. One of the interesting findings regarding the motivators in the data analysis is that it would be difficult to divide the motivators into positive or negative influencers with dichotomies. That is, one motivating factor would have the dual nature of driving force, which depends on how the management, or team leader would use it for encouraging the members to take part in knowledge sharing. For example, the remuneration scheme may be one of the prompt, convenient, and cost efficient methods makes the employees to share knowledge with others in the team. However, the over-reliance on this plan with the long-term perspective would lead the negative consequence such as the employees’ pursing the monetary reward rather than sharing one’s information or knowledge. To follow, if the management reduces the workload in order for the employees to stimulate knowledge sharing, there may be a possibility that the productivity of each unit of project teams would be lessened.
Lastly, the perception of self-efficacy, which is one’s belief of being capable of doing something, is also a significant element to enhance knowledge sharing in the project-based organisations. While other three-factors were closely relevant to other members’ influences, this core category is related to one’s decision whether to participate in sharing knowledge or not. Moreover, the relationships between the concepts have been explained in order to enhance the understanding of the conceptual model. The relationship showed that all the concepts of trust could have a significant influence on other concepts in other three core categories; and the concepts in relationship would impact on the concepts in trust and self-efficacy. Despite lots of informants stressed the significance of motivation for knowledge sharing, the impact of concepts in motivation was slightly less than the effects of other concepts to others. One very important point of the relationship between the concepts is that all the concepts of each category could affect each other.

Along with the data analysis, this chapter also dealt with the comprehensive cross-case analysis, which compared similarities and differences amongst the research participating firms. The comparative analysis showed that trust is more influential than the other core categories such as relationship, motivation, and self-efficacy in the five companies. In addition, motivation is also a prominent element to intensify knowledge sharing across the investigated companies. While those two aforementioned core categories (i.e. trust and motivation) had a number of similarities and commonalities amongst three involved organisations, the remaining two core categories (i.e. relationship, and self-efficacy) showed little likeness between them. However, it was difficult to discover similarities and commonalities in the core categories of relationship and self-efficacy.

So far, the research findings of this study were dealt with in two ways, which one was for the analysis of the core categories, and another approach was the cross-case comparisons across the findings. Based on these two analyses of data in this study, further discussion of findings will be explored in the following chapter 6.
Chapter 6  Discussion of findings

6.1 Introduction

The research findings and cross-case comparison analysis were presented in the previous chapter. This chapter firstly discusses the four key components of knowledge sharing - trust, relationship, motivation, and self-efficacy - in the project-based organisations. The key findings of this study compare with the extant literature, in order to determine the position of this research project as well as to illustrate the new insights from the findings. Following this, a theoretical model of this study presents in this chapter. In the section of a theoretical model development, the storyline of this study demonstrates that it would be useful to comprehend the overall structure and relationship amongst core categories and concepts. Along with the story line, the final suggestion of the integrated model is suggested. Finally, this chapter deals with the theoretical model reflecting on the discussion, and the storyline for the further theoretical and practical stance.

6.2 Discussion of findings

As shown in Chapter 4 and 5, it was discovered that knowledge sharing is the core process of knowledge management within the project-based organisations. The four categories were found as the core elements for enhancing knowledge sharing in the project-based organisations: trust; relationship; motivation; and self-efficacy. These findings should be compared with the current literature in order to determine their positions. In the following subsection, the detailed description is presented for a further discussion.

6.2.1 Trust

It was not surprising that trust between members could be a significant element to encourage them to share knowledge in the project-based organisations. The important role of trust in knowledge sharing or exchange can be found in a large number of literatures regardless of the fields of studies (Ackerman et al., 2003; Evans, 2013; Lucas, 2005; Chowdhury, 2005; Abrams et al., 2003; Mooradian et al., 2006; Husted and Michailova, 2002). Evans (2013), for instance, showed the important role of trust for building knowledge sharing in the Canadian jurisdictional law firms. Renzl (2008) found
a positive relationship between trust in management and knowledge sharing behaviour within and between project teams. In Jones and George’s study (1998), they implied that fostering unconditional trust would be beneficial to develop and exchange tacit knowledge in organisations. Moreover, Lucas (2005) stated that trust, which has been built over time, would have a significant impact on transferring the best practices in a company. While the important role of trust in knowledge sharing was found in other research areas such as strategic management, organisational behaviour research and organisational psychology studies, the relationship between knowledge sharing and trust have been relatively unexplored in the project management field.

The findings discovered in this study mirror those of previous studies that have examined the effect of interpersonal or mutual trust on knowledge sharing and its consequence. It is commonly accepted that one would expect positive influences of trust towards knowledge sharing such as enhanced knowledge exchange in the organisation, less costly knowledge exchange, the high quality of shared knowledge, and increasing the likelihood of more use of the acquired knowledge (Bakker et al., 2006; Levin et al., 2002; Renzl, 2008; Holste and Fields, 2008) and thus trust should be cultivated in order to enhance knowledge sharing between the members in the project teams. Moreover, while the trust core category could affect the core category of relationship between others, and self-efficacy, trust has little influence on motivation. These findings seem to be consistent with other researches which have found that trust is the missing link to explain the relationship between the employees’ ties and knowledge sharing (Hansen, 1999; Levin et al., 2002; Hansen, 2002; Levin and Cross, 2004; Dirks and Ferrin, 2001). In this PhD research, the interview participants showed that the extent of trust (i.e. how much I trust the colleagues or how long have I known them?) to others is one of crucial determinants of the quality of the shared knowledge rather than the quantity and frequency. That is, due to the development of information and communication technology, lots of people can access and acquire any information or knowledge on the Internet or other forms of technology. However, the degree of trust between the members in the project team, even in the same team members, differentiates the quality of knowledge. This also accords with Chiu et al. (2006) study, in which is indicated that although trust on knowledge sharing in the virtual communities is less important than conventional organisations, trust between the members would determine the quality of shared knowledge rather than the quantity of it.
Thus, trust is one of the greater influencers on the members’ knowledge sharing, since it would not only be the decision maker of participation of knowledge sharing, but also the determinant of the quality of shared knowledge. In addition to the general findings of the relationships between trust and knowledge sharing, the researcher also explored the factors that would have an influence on the concepts in trust core category for knowledge sharing in the project-based organisations. These components are securing the position, sharing visions and missions, affiliation with others, and support from all the different levels in the firm. In the following section of the chapter, these findings are discussed in detail.

6.2.1.1 Securing

It was discovered that the security issue related to knowledge sharing is one of the crucial factors that influence building up trust for improving knowledge sharing with members in the project-based organisations. The risen security issues from the collected data include the five elements which are the stability of one’s position or retirement, the fair usage of the shared knowledge, the guaranteed acceptable quality of shared knowledge, free-riders, and the reduction of competition. In a similar vein, a number of studies indicate the significance of security issues in terms of knowledge sharing in the organisational settings (Lin, 2007a; Ardichivili et al., 2003; Ardichivili et al., 2006; Tamjidymcholo et al., 2013; Evans, 2013; Bartol et al., 2009). A number of extant literature maintain that one of the most prevalent worries regarding knowledge sharing is the owner’s perceptions that the knowledge would be exploited or distorted for other purposes by the recipients or the knowledge seekers (Riege, 2005; Sharratt and Usoro, 2003; Hall, 2001; Hislop, 2003; He and Wei, 2009; Vera-Muñoz et al., 2006: Gupta et al., 2009).

It was found that a precondition of cultivating knowledge sharing in the project-based organisation is to guarantee the members’ position even though they offer or sacrifice one’s valuable or competitive edge against others. A number of interviewees stated that securing his or her job position had a significant impact on the participation of knowledge management and knowledge sharing in the recent economic situations. In other words, it would be impossible to make the employees to share their valuable intellectual assets under circumstances which the individual’s job is not guaranteed and is
unstable. Thus, obtaining job security or guaranteed job position would be the starting point of trust between management and employees as well as knowledge sharing in a firm. Likewise, the extant literature shows that when the firm wants for the employees to engage in knowledge sharing, the foremost precursor is to guarantee their job position (Ardichivili et al., 2006; Riege, 2005).

One of the interesting findings in this study was that a number of the research participants worried about the misuse of one’s shared knowledge. In other words, the intentions of sharing knowledge to others are derived from the human being’s good will or altruistic mind toward the other members in a team or a company. Despite of such good intentions of sharing knowledge, some of the members in the project teams would probably exploit the shared knowledge for one’s own sake such as promotion, showing the outstanding one’s performance to the management etc. It was found that the exploitation or manipulation of the shared knowledge is one of the interfering factors for the members to build up interpersonal trust as well as to take part in knowledge sharing in the project teams (Evans, 2013). Similarly, in Ardichivili et al.’s study (2003), the fear of criticism and the fear of inadvertently or misleading others with using the shared knowledge is one of the barriers to share knowledge in the organisations. Similarly, Vera-Muñoz et al. (2006) maintained that trust would not only increase the extent of knowledge sharing, but also enhance the employees’ creativity. Accordingly, when the shared knowledge is guaranteed that it will only be used for the organisational development or team progress, more members in the project team would participate in knowledge sharing with others.

Another interesting finding towards the trust aspect of knowledge sharing is the quality of shared knowledge, and the judgment of others in the teams. The former issue is directly related to the company’s knowledge management systems or any other similar systems such as document management systems or expert directories. This finding suggests that when the company wants to lead more participation of knowledge sharing with using the own system, the stored or shared knowledge in the system should be unique and relevant to the users’ work. Also, it should be distinctive from the information or knowledge in the Internet or any other network. Another point in this category is when the members in the project team consider others as knowledgeable and intelligent, trust between them would be strengthened as well as more members would be
engaged in knowledge sharing. Moreover, the result shows that the trust towards knowledge source would determine the frequency of participation as well as the quality of shared or traded knowledge amongst colleagues. Similarly, a number of extant studies show that the expectation of the others’ capabilities or returns is the starting point of interpersonal trust in the organisations (Mayer et al., 1995; Levin et al., 2002; Bartol, 2002; Cummings, 2004; McDermott, and O’Dell, 2001; Cabrera and Cabrera, 2002).

It was also found that the people’s antipathies towards knowledge sharing such as free-riders, and harsh competition should be eliminated, or reduced in order to nurture trust among the members. This finding shows that such antipathies would make it worse for the members’ intentions, and behaviours to share knowledge with others. As shown in this research, the negative consequence derived from free-riders could be found variety of previous researches (Cabrera and Cabrera, 2005; Matsuo and Easterby-Smith, 2008; Cabrera et al., 2006). For example, Matsuo and Easterby-Smith (2008) suggest that knowledge sharing would face the so-called “public-good dilemma’, and in order to prevent from such difficulty, removal or reducing the pervasive of free-riders would be one of crucial elements for enhancing knowledge sharing. In a similar vein, the extant studies assert that the prevalent of free-riders in the firms would cause detriment consequences to knowledge sharing such as taking advantage of the shared knowledge without any contribution, not using the knowledge management systems, or hoarding the knowledge rather sharing (Lilleoere and Hansen, 2011; McDermott and O’Dell, 2001; Husted and Michilova, 2002; Riege, 2005; Ardichvili et al., 2003). Furthermore, whilst lots of researches indicate that the internal competition would be beneficial for the employees’ development and progress (Creane and Davidson, 2004; Nonaka and Takeuchi, 1995), theorist of knowledge management and knowledge sharing advice that in order to enhance trust on knowledge sharing the competition should be managed for the optimal conditions (Tsai, 2002; Cabrera and Cabrera, 2002; Cummings, 2004). Hence, it is recommended that the leader or senior members should intervene the competitive environment and the prevalence of free-riders in order to encourage of knowledge sharing in their project teams (Cabrera and Cabrera, 2002; Riege, 2005; Okhuysen and Eisenhardt, 2002).

In summary, securing is a crucial element of trust aspect of knowledge sharing in order to stimulate knowledge sharing in the project-based organisations. In addition, ‘security’
influences on the others’ intention to share the higher values, to affiliate others who have similar or higher knowledge, and to support others. In other words, securing is the most influential factors to other concepts in the trust category.

6.2.1.2 Sharing

It was discovered that trust could be intensified, when the members in the project team share not only specific knowledge or ideas that is directly relevant to their works, but also the higher value and virtue such as missions, vision, or goals (Abrams et al., 2003; Wasco and Faraj, 2005; Chow and Chan, 2008; Pan and Leidner, 2003; Cabrera and Cabrera, 2005; Levin et al., 2002; Chang and Chuang, 2011; Chow et al., 2000). Similarly, several studies indicate that establishing and ensuring the shared visions and languages are important elements of interpersonal trust, which enable knowledge sharing in the personal networks (Majchrzak et al., 2000; Makela et al, 2007; Mooradian et al, 2006; Soekijad and Andriessen, 2003; Huysman and Wulf, 2006; van den Hoof and Huysman, 2009; Collins and Smith, 2006). Moreover, a number of studies also showed that sharing vision, missions, or project objectives is critical for the project team members to encourage sharing knowledge and one’s valuable intellectual assets with others (Jones and George, 1998: Tsai and Ghoshal, 1998; Mooradian et al., 2006; Zakaria et al., 2004; Hendricks, 1999). While ‘sharing visions, missions or objectives’ has been paid attention by lots of academics in project management research (Renzl, 2008; Mooradian et al., 2006; Tsai and Ghoshal, 1998; Abrams et al., 2003; Chow and Chan, 2008; Pan and Leidner, 2003; Cabrera and Cabrera, 2005; Levin et al., 2002), few studies have focused on the relationship between sharing visions and knowledge sharing in project management context. Thus, this finding provides a new insight of knowledge sharing in project management discipline.

This study demonstrated that the two elements of sharing could intensify trust of knowledge sharing in the project-based organisations (i.e. visions sharing, and clarifying the sources). In this research project, sharing the highest virtue such as visions, values, or emotions with others in a project team or a company could lead more fruitful outcomes of knowledge sharing compared to the spiritless participants (e.g. the quality and quantity of the shared knowledge, and one’s degree of participation etc.). Similarly, this finding of the current study is consistent with that of Jones and George (1998) who claimed that
values, attitudes, and moods and emotions are critical elements to create one’s degree of trust as well as these would affect one’s behaviour of trust to others. Moreover, a number of studies show a similar vein which emotional, virtuous or ethical components are important to create trust among the group members (Renzl, 2008; Mooradian et al., 2006; Li, 2005; Inkpen and Tsang, 2005; Gagené, 2009). The concept of ‘clarifying the source of knowledge between the members’ has not been suggested and this concept seems to be newly discovered in this research domain. That is, the knowledge seekers in this transaction (i.e. knowledge sharing or knowledge exchange) tend to be more reliable on the knowledge owners who is more prominent or famous in the certain subjects or areas (Park and Lee, 2014). Despite this result which one tends to depend upon more knowledgeable persons, a number of researches suggest that the degree of knowledge sharing would rely on long-term positive relationship rather than one’s fame and confidence.

In a nutshell, sharing the higher values is one of the essential components of trust in order to encourage knowledge sharing in the project-based organisations. In this context, knowledge sharing is not merely sharing information, or knowledge but sharing the highest virtues in the human society.

### 6.2.1.3 Affiliation

In this research, affiliating with the members who have similar, or higher level of knowledge would be one of the facilitating factors to create trust between the members in the project team. The affiliating issues in this category include four key concepts which are communicating with others, reciprocity, benevolence and proximity to others (Hutchings and Michailova, 2004; Subramani and Rajagopalan, 2003; Hsu and Lin, 2008). Similarly, a number of extant researches show the importance of associating with others who have similar knowledge or information (Koh and Kim, 2004; Hsu et al., 2007; Hansen, 1999; Zakaria et al., 2004; Chow et al., 2000; Widén-Wulff and Ginman, 2004; Ardichvili, 2008). Although the significance of creating joint membership has been relatively unexplored, this study has shed light on its usefulness for enhanced knowledge sharing in the project management domain.
The research findings showed that the members in the project-team would group together with other members who have a similar or higher level of knowledge in order to share similar or better knowledge. In other words, in order to guarantee the success of knowledge sharing, people would tend to seek anyone who has more knowledge which could be useful to develop one’s competence or expertise. The newly recruited member who join the clique may consider the existing club’s reputation to determine whether he or she will share knowledge or not. Moreover, the credibility and reliability of knowledge source is one of the significant factors in order to lead the successful participation of knowledge sharing in the project team. Such trustworthiness of knowledge is not only the barometer for the knowledge seekers but also the basis of trust for enhancing knowledge sharing (Kearns, and Ledere, 2003; Haas and Hansen, 2007; Andrews and Delahaye, 2000; Lin et al., 2009). In a similar point of view, Lucas (2005) states “access to information is a consequence of selective decision making and is tantamount to membership in an elite club. One way to gain entry into this elite club is through sponsorship. Once selected to join the club, all efforts are made to provide the tools for success. In terms of knowledge transfer, sponsored mobility occurs when specific employees are targeted and selected as “good candidate” for adopting something new.” That is, both knowledge seeker and owner would search for who will utilise the best knowledge and who will provide the best knowledge to one’s performance (Thomas-Hunt et al., 2003; Ardichvili et al., 2003; Cabrera and Cabrera, 2002; Ipe, 2003; Riege, 2005; Hansen et al., 1999).

Likewise, the physical and psychological distance between the members is one of the crucial factors for them to get close and to associate with others in order to build up trust for better knowledge sharing. In this research, benevolence and reciprocity are crucial elements to heighten the members’ psychological distance for enhancing knowledge sharing. In a similar vein, the extant literature shows that the closer the members with others, the better trust between them as well as the greater amount of knowledge is shared (De Vries et al., 2006; Cabrera et al., 2006; Yang and Chen, 2007; Smith and McKeen, 2003; Cabrera and Cabrera, 2005). Thus, affiliating with who has the similar level or higher level of knowledge will be the basis of creating reputation from others and such reputation is one of significant factors to create trust between the members in the project-based organisations.
6.2.1.4 Supporting

It was not a surprising finding that supporting is one of significant elements to build up trust for knowledge sharing between the members in the project environment. In this context, supporting implies not only from colleagues and members in a project team, but also from management and other stakeholders related to projects. Similarly, a number of literature shows that the management commitment (Chow and Chan, 2008; Dyer and Nobeoka, 2000; van den Hooff and De Ridder, 2004; Hislop, 2002; van den Hooff and van Weenen, 2004) as well as the employees’ faith to the management is a crucial barometer to encourage knowledge sharing in the company (van den Hooff and de Leeuw van Weenen, 2004; Davenport and Prusak, 1998; Gupta et al., 2000). Vast amount of literature maintain that supports from management and colleagues would be one of the crucial success factors towards knowledge sharing (Cabrera and Cabrera, 2005; Lin and Lee, 2004; McDermott and O’Dell, 2001). Despite of acknowledging the importance of supporting for knowledge sharing in various research areas, relatively few researches have been paid attentions in the project management domain.

This study demonstrated that the three elements of supporting based on management commitment, continuity, and technology would become the fundamental of building trust for heightening knowledge sharing in the project-based organisations. In this research, the informants indicated that the supports and commitments from all levels of the company would be an essential ingredient for promoting members’ engagement in knowledge sharing. Especially, management commitment is an important support for knowledge sharing. From the extant studies, Renzl (2008) tested the relationship between the trust in management and the level of knowledge documentation. The result showed that the more trust in management, the more favourable employees’ atmosphere to document their knowledge in the company’s knowledge system.

Likewise, technological support is one of the crucial elements for intensifying the trust between the employees and the management in the project teams. From the extant literature, lots of researchers have considered trust is a potential motivator for the employees’ engagement of knowledge sharing (Abrams et al., 2003). In this research, the project team members would consider the adequate and various technological assistances which reflect on the individuals’ or project teams’ demands is a sign of the management trust towards the members. This finding is in accordance with the extant literature, which
emphasises the importance of technological support for enhanced knowledge sharing (Zakaria et al., 2004). In addition, the research finding suggested that, in order to build up concrete and extensive trust (i.e. interpersonal trust between the members or between the employees and the management), the continuous sustenance rather than casual interests is required from the entire organisation. Similarly, a number of researches claim the importance of continuous attention for not becoming knowledge management as management fashion or fad (Hislop, 2002; Swan et al., 1999; Loughridge, 1999; Wong, 2005; Lawton, 2001; Chourides et al., 2003).

In summary, supporting from management as well as other members, continuous support, and technological support are the key aspects of supporting for promoting knowledge sharing in the project-based organisations.

6.2.2 Relationship

It was discovered that knowledge sharing in a project-based environment could be enhanced by better and concrete relationship with others in the project team. In a similar vein, a number of researchers have claimed that relationship would be the fundamental of creating trust between people through the personal and historical contacts with variety of methods such as face-to-face contacts, computer-aided contacts etc. (Chiu et al., 2006; Ipe, 2003; Cabrera and Cabrera, 2002; Huang et al., 2008; Holste and Fields, 2008; Sveiby, 2001; Panteli and Sockalingam, 2005). Those relationships that are built upon a long-term trust have a greater influence on the credibility and reliability of the shared or transferred knowledge (Swart and Kimme, 2003; Hsu et al., 2007; Szulanski, 1996; Bock et al., 2005). As a result, relationship in knowledge sharing has a significant impact in both the shared knowledge and building up trust between the members in the project-based organisations (Davenport and Glaser, 2002; Hansen, 2002; Lucas, 2005; Chow and Chan, 2008; Liao et al., 2004). However, the significance of relationship to encourage knowledge sharing in the project environment has been seldom considered by the academics.

In this research, the research findings indicated that the factors would affect the relationship between the members are exchanging knowledge as well as others, understanding the others’ situation etc., and membership. It is commonly accepted that
the positive relationship with the others would affect the depth and breadth as well as
types of shared knowledge between the participants (Bock et al., 2005; Hsu and Lin,
2008; Ipe, 2003; Liao et al., 2004; Chow and Chan, 2008; Panteli and Sockalingam,
2005). The findings of the current study suggest that good personal relationship from a
long and favourable history would facilitate strong trust for better knowledge sharing.
Furthermore, such good relationships with the members would change the individuals’
perceptions towards knowledge sharing or knowledge transfer, because through the long-
term relationship with others, one has observed the knowledge owners’ competence and
evaluated the credibility and reliability which would be useful or trustworthiness for
oneself. These findings are consistent with other researches which found that strong and
good relationships are the fundamental of promotion and enhancement of knowledge
sharing in the organisations (Chow and Chan, 2008; Lucas, 2005; Hansen, 2002).
Similarly, Hansen (2002) shows that the positive and long-term relationship with the
team members would not only enhance the degree of knowledge sharing but also reduce
the overall cost of knowledge management and codification process in the research and
development project teams.

Accordingly, this study produces results which are consistent with the findings of the
previous work in other research domains. That is, the relationship between the members
is one of the crucial determinants to promote members in the team to engage in
knowledge sharing. While a number of researches have claimed the importance of a
strong and positive relationship with others in various research areas, relatively little
attention have been paid in the project management domain. In the following section of
the chapter, these findings are discussed further in detail.

6.2.2.1 Linking
It was found that linking members together as one of the essential aspects of relationship
could heighten the members’ participation of knowledge sharing in project-based
organisations. The linking category includes two key concepts which are meeting in
various ways, and rapport building. Similarly, a large number of researchers indicate the
significance of linking the members in the project teams together to enhance their
knowledge sharing behaviours and intentions (Dyer and Nobeoka, 2000; Davenport and
Prusak, 1998; Hansen, 1999; Kotlarsky and Oshri, 2005; Hall, 2001; Hansen et al., 1999;
Malhotra and Majchrzak, 2004). For example, Dyer and Nobeoka (2000) studied the relationship between know-how sharing and the productivity of automobile production in the US and Japan. According to them, the knowledge sharing would depend upon employees’ inter-connectedness and bondage with each other. Despite of the significance of forging links to improved knowledge sharing, relatively few researches have been carried out to explore the relationship between knowledge sharing and linking in the project management domain.

This study demonstrated two key elements of linking that would enhance the relationship between the project team members for increased knowledge sharing. One of the interesting findings in this study was that most of the informants claimed that one of the significant antecedents to establish relationship for knowledge sharing is to meet the members frequently on the regular or irregular basis. That is, in order to create relationships with others, one should meet variety of people inside and outside of the organisations. Through such meeting, one would be able to create new relationship as well as to strengthen the existing relationship. Under such a positive relationship with other members, sharing knowledge would be easier to take place than the opposite situations. Similarly, a number of studies have claimed the importance of meeting various people for enhanced knowledge sharing (Kotlarsky and Oshri, 2005; Hall, 2001; Hansen et al., 1999; Malhotra and Majchrzak, 2004). Likewise, based on meeting various members in variety of ways, one would be able to create new rapports which are the basis of his or her knowledge sharing network. The members’ own network is one of the important knowledge sharing places where one would share or exchange valuable intellectual assets with others. A number of researchers explained such phenomenon adopting social capital theory and social exchange theory (Chiu et al., 2006; Bock and Kim, 2002; Hsu and Lin, 2008; Tsai, 2002; Widén-Wulff and Ginman, 2004; Thomas-Hunt and Neale, 2003; Wasko and Faraj, 2005; Inkpen and Tsang, 2005).

Briefly, linking the members in the project team together is one of essential features to build up the relationships for promoting knowledge sharing. It was found that meeting the members on the regular basis is a potential method to establish the relationship with others. Moreover, spontaneously created network has a greater influence on building the relationship with others in the project-based organisations.
6.2.2.2 Understanding

The result showed that understanding each other would intensify the relationship with others for better sharing knowledge in the project-based organisations. The understanding category includes three key concepts which are shifting the role or rotating the jobs, horizontality rather than verticality, and training or educating the members on the regular basis. Similarly, a number of extant studies show the importance of understanding others to heighten the degree of sharing knowledge in the organisations (Nonaka, 1991; Nonaka and Takeuchi, 1995; Dyer and Nobeoka, 2000; Davenport and Prusak, 1998; Collins and Parcell, 2001). Nonaka (1991), for example, he implied the importance of rotating job position would be a fundamental element for creating knowledge as well as transferring the firm’s memories to employees. However, in the project management research domain, understanding has been relatively unexplored to encourage sharing knowledge with others.

This study demonstrated that the three elements of understanding would enhance the relationship between the project team members for enhanced knowledge sharing. The most interesting finding was that majority of the informants asserted one of the precursors for sharing knowledge is to recognise what others are doing exactly and what is being happened in the firm. In order to comprehend the current situation in the organisation, it is recommended to shift the role with others (Nonaka, 1991; Nonaka and Takeuchi, 1995; Dyer and Nobeoka, 2000). In this study, job shifting is not only a way to understand others in the firm, but also a natural method to acquire knowledge by doing it. That is, knowledge sharing is one of cognitive processes between two parties which are the knowledge owner, and the knowledge seeker. Yet, when the members are in charge of others’ role, it would be possible for them to attain other knowledge by doing the other roles. Whilst the extant literature stresses the role shifting would be beneficial to create new knowledge in the company (Nonaka, 1991; Nonaka and Takeuchi, 1995; Dyer and Nobeoka, 2000), this study shows that role shifting would be a useful way to enhance sharing knowledge in the project-based organisations.

Furthermore, it was also found that horizontality in the team, and training would be beneficial to promote knowledge sharing in the project-based organisations. The former finding, horizontality, has been discussed by a few of organisational theorists (Riege, 2005; Ardichvili et al., 2006; Zhuge, 2002a; Cummings, 2004). The latter one has also
been dealt with by various academics to improve the firm’s performance level and to achieve innovation and sustainable competitive advantage (Zakaria et al., 2004; Bock and Kim, 2002; Gagné, 2009; Ipe, 2003; Pan and Scarborough, 1998; Lu et al., 2006; Riege, 2005; Hsu et al., 2007; Connelly and Kelloway, 2003). However, few efforts have been done to explore the connections between knowledge sharing and their usefulness. In this study, the researcher discovered that both elements which are horizontal structure of the organisation (i.e. this does not mean the physical structure of the company but this is closeness between the members), and training or educating the members, would have a significant influence on the enhancement of the degree of knowledge sharing with the other members in the project teams.

6.2.2.3 Membership

It was found that membership was one of the significant aspects of relationship could promote knowledge sharing between the members in the project teams. When it comes to knowledge sharing, various studies claim that it is important for the employees to recognise who the person will engage in knowledge sharing rather than who the person will be knowledgeable (Lucas, 2005). While continuous interests and researches with respect to membership for enhanced knowledge sharing have been conducted in other management research domain (Subramni and Rajagopalan, 2003; Hsu and Lin, 2008; Zakaria et al., 2004; Widén-Wulff and Ginman, 2004; Huysman and Wulf, 2006; Staples and Webster, 2008; Bobrow and Whalen, 2002), it is obvious that the relatively few attentions have paid the potential role of membership on knowledge sharing in the project management domain. In this study, three key components which are recruiting, strategic alliance, and human resource management has significant influence on membership of knowledge sharing. Further details are dealt with in the following part of this chapter.

It was surprising that recruiting the appropriate personnel is one of crucial ways to increase the members’ sharing knowledge in the project teams. Similarly, a number of literatures show the significance of properly employing the staff who has similar values and virtue (Chow and Chan, 2008; Mooradian et al., 2006; Vera-Muñoz et al., 2006; Swart and Kimmie, 2003; Möller and Svahn, 2004; MacNeil, 2003). According to Chow and Chan’s study (2008), they stated that in order to make the employees participate in
knowledge sharing, the recruitment of personnel who share the firm’s common interests, visions, or goals is one of the significant elements to promote knowledge sharing. Moreover, Mooradian et al. (2006) indicated the significance of recruitment as “personnel selection and retention are among the central and most influential functions of management, and firms routinely request or require employees to submit self-reports regarding personality and personality-like traits. Similarly, it will help them to identify others who may be predisposed away from knowledge sharing and therefore may benefit from specific attention and special coaching”.

Subsequent to recruitment of appropriate staff, human resource management is also a crucial aspect to encourage knowledge sharing in the project teams. Similarly, variety of previous studies confirms the important role of human resource management in the organisations (Fong et al., 2011; Hislop, 2002; Aziri et al., 2013). According to Fong et al. (2011), human resource management has an essential role to intervene the members by individual performance appraisal as well as to allocate the suitable members to the proper positions or teams in the firm. Likewise, the success of knowledge management initiatives is determined by predicting the workers who are prepared to share their knowledge and it is considered that the core of such task is human resource management in the firm (Hislop, 2002).

6.2.3 Motivation

It was found that motivation could enhance the individuals’ knowledge sharing in the project-based organisations. Various motivators have significant influences on both the degree of individual’s participation and the quality and quantity of the shared knowledge. For example, one who is well-motivated tends to share more frequently and more widely with others. In accordance with this finding, previous studies have demonstrated that the relationship between motivation and knowledge sharing from various researchers from operation management, human resource management, organisational behaviour, strategic management, sociology, organisational psychology and so forth (Osterloh and Frey, 2000; Lai and Chen, 2014; Hsu and Lin, 2008; Hendricks, 1999; Gagné, 2009; Lin, 2007; Siemsen, et al, 2008; Bock and Kim, 2002; Bartol and Srivastava, 2002). Nevertheless, the theorist in the project management domain have claimed the importance of knowledge sharing and knowledge management in the temporal forms of organisations
such as project teams etc., relatively little attention has paid how to motivate the members to take part in knowledge management or knowledge sharing within such environment.

The expression ‘Carrot and lash’ is widely used to emphasise the significance of motivation and punishment. It is especially widely accepted that motivation is a very useful method to make the individuals in organisations conduct the target behaviour, or achieve the certain goals in the organisations. In the current study, the researcher found a variety of potential motivating elements for increasing people’s engagement of knowledge sharing in the project-based environment. These findings seem to be accordance with other researches which claim that management would expect the better results from the motivated people compared to non-motivated employees (Nicholls, 1984; Humphreys and Revelle, 1984; Van Knippenberg, 2000; Locke et al., 1981; Hung, 2011). For example, lots of human resource management theorists claim that the motivated employees provide better productivity, lower level of staff turnover, and improved product quality. Furthermore, the company would expect to attain better reputation and competitive advantage by the well-motivated personnel (Ardichvili et al., 2003; Hendricks, 1999; Lin, 2007a; Javernick-Will, 2012).

In this research, the researcher grouped potential motivators into three categories for better knowledge sharing in the project-based organisations: workload; culture; and remuneration. As mentioned previously, the important role of motivation in order for achieving the certain aims has been researched in other various research domains. Despite of such high praise of motivation, it was discovered that any of the suggested motivating factors in the current study would influence on as either barrier or enabler for better knowledge sharing in the organisations. In other words, it is difficult to judge them and categorise into one aspect either enabling or interfering forces. They have a dual nature which means one element would facilitate knowledge sharing or interfere knowledge sharing as to how it would be utilised. Accordingly, if one would expect to have the best consequences of knowledge sharing with using these motivators, management should be balanced to harness them. That is, over-reliance on one aspect would lead to a detrimental result of knowledge sharing or any other goals in the organisations. For example, while lots of researchers have asserted that the monetary reward is one of the most prompt, and efficient methods to stimulate the employees to
take part in knowledge sharing, another group of researchers appeal that the company should be careful of the adverse effects of it (e.g. pursuing the reward rather than knowledge sharing, changing the means and goals, or detrimental effect of monetary reward) (Eisenberger and Cameron, 1996; Bartol and Srivastava, 2002; Bock and Kim, 2002; Bock et al., 2005; Bonner and Sprinkle, 2002). The further details of each motivation are discussed in the following section.

6.2.3.1 Workload

The current study found that one of the principal motivators for knowledge sharing in the project-based organisation is the individuals’ or teams’ workload (i.e. The individual has task inundation during a project execution). In a similar vein, a number of previous studies indicate the potential role of a reduced workload for motivating the members in the companies (Huysman and De Wit, 2004; Bobrow and Whalen, 2002; Sik-wah Fong and Chu, 2006; Voelpel and Han, 2005; Huang, 2009; Yao et al., 2007; Bosua and Scheepers, 2007; Xue et al., 2011).

This study demonstrated three elements in the workload category (i.e. overcoming the task inundation, integration with the daily tasks, and changing the individuals’ perceptions) would be the potential motivation for enhancing knowledge sharing in the project-based organisations. First of all, an interesting finding in this study was that most of the interview participants had already recognised the greater usefulness and the positive consequences when they manage their knowledge and share the created, or stored knowledge in the teams. However, majority of the informants were hesitant to apply knowledge sharing to one’s work because of task inundation, or the overload of tasks. That is, each member of the project teams played like a multiplayer who is in charge of several similar roles at the same time. While a number of the interviewees in this study underlined the significance of lessened workload for enhanced knowledge sharing, little literature has considered the relationship between knowledge sharing and reduced workload.

Likewise, it was found that one of the ideal forms of knowledge sharing in the project team is the integration of daily tasks with the knowledge sharing framework. In a similar vein, several researches stated the ease of use, or accessibility as one of the essential
features to stimulate the employees to share their knowledge in the firm (Bock and Kim, 2002; Riege, 2005; Connelly and Kelloway, 2003; van den Hooff and Ridder, 2004; Yang, 2007; Soekijad and Andriessen, 2003). In this research, the findings suggest that in order to motivate the members to engage in knowledge sharing at all times, the ideal form of knowledge sharing is an integration knowledge system with each member’s routines. Despite of the emphasis of such significance of knowledge and knowledge sharing, few of the members have been sharing knowledge as a daily activity or routine. Similarly, some of the extant literature also claims the importance of integration knowledge sharing systems with the employees’ task and reflecting on the organisational nature (Zakaria et al., 2004; Dyer and Nobeoka, 2002; Riege, 2005; Hall, 2001; Malhorta, 2004; He and Wei, 2009; Dyer and Singh, 1998; David and Fahey, 2000). Although a number of academics have investigated the integration of knowledge sharing and daily tasks, relatively few attentions have paid the amalgamation of them in the project management research domain (Koskinen et al., 2003).

Lastly, it was discovered that the most important groundwork for encouraging the members to take part in knowledge sharing is to change the individual members’ perceptions, or mindsets towards knowledge sharing, and relevant activities. That is, in this research, it was prevailed that sharing means being deprived of one’s valuables. Yet, a number of researches show that knowledge sharing is one of the vehicles to enhance one’s capabilities, and performance level (Kotabe et al., 2003; Srivastava et al., 2006; Edmondson et al., 2003; Taylor and Wright, 2004) as well as to achieve sustainable competitive advantage (Lubit, 2001; Alavi and Leidner, 1999; King and Ko, 2001; Grant, 1996; Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995). Thus, one of the most important motivations towards workload is to change one’s prejudice toward knowledge sharing.

To summarise, workload is one of the essential features of motivating the members to participate in knowledge sharing. As mentioned in the introduction part of this subchapter, workload should be equally balanced for better knowledge sharing. That is, when the workload is reduced too much, the organisational performance level would be dropped down at the same time. Accordingly, the individuals’ workload should be imposed for both of sharing knowledge and the firm’s performance. Moreover, in order
to achieve such things, the project managers or senior team members would have to reflect on each member on the regular basis.

6.2.3.2 Culture

It was found that culture is a significant factor to motivate the members in a project team to participate in knowledge sharing. Normally, culture is defined as the overall atmosphere of the group or the characteristics of particular group of people (Yang, 2007; Bock et al., 2005). Moreover, plenty of studies show that the corporate or organisational culture would not only have a significant influence on each member’s behaviour but also change the individuals' behaviours (van den Hooff and Ridder, 2004). In a similar vein, considerable amount of studies in knowledge management have claimed that culture is one of the potential enablers or motivators to enhance the firm’s knowledge sharing (Xue et al., 2011; Collison and Parcell, 2004; Connelly and Kelloway, 2003; Davenport and Prusak, 1998). In addition, the extant literature asserts that the impact of culture would be far greater than any other motivators in terms of duration and the degree of its influence (Bock et al., 2005; Ipe, 2003; Al-Alawi et al., 2007; Zakaria et al., 2004; Cabrera et al., 2006).

Similarly, the result of this study shows that the enormous and potential impact of culture would be a motive for the individuals’ knowledge sharing behaviours. While other motivating factors in this study would have an affect on the knowledge sharing behaviour directly, culture would influence on each member’s behaviour in indirect and unforeseen ways (De long et al., 2000; Smith and McKeen, 2003; Janz and Prasarnphanich, 2003). That is, one would be absorbed on the atmosphere or climate of the project team without any consciousness of its influences. As a result, the members would not be able to recognise the significant influence of knowledge sharing culture but he or she would share knowledge unconsciously.

This study demonstrated five elements which would be beneficial to cultivate knowledge sharing culture in the project teams: tolerating failures and challenges; free communication; willingness to new comers or novices; accepting the diversity; and fostering the less competitive atmosphere. When the atmosphere of the team is strict and not allowing any negative results, one would be shrunken to share one’s any ideas or
knowledge to the public. The research finding showed that one of the potential enabling climates in the project team is the friendly atmosphere towards any types of knowledge, information, or data. In addition, freely communicating with others is an essential element for cultivating knowledge sharing in the project teams. Similarly, vast amount of the extant literatures indicate that the friendly reactions to one’s knowledge would be beneficial to promote knowledge sharing (van den Hooff and Huysman, 2009; de Vries et al., 2006; Zhou and Fink, 2003; Wong, 2005; Meso and Smith, 2000). On the other hand, the criticisms towards one’s knowledge or ideas would make it difficult for the employees to share their knowledge (Lin et al., 2009; Chen and Hung, 2010; Alazmi and Zairi, 2003).

Moreover, it is common for the project-based organisations to work with multi-national members from diverse cultural backgrounds in the recent years. Also, these are common practices to move new members in and out frequently in the project teams. There are lots of potential barriers under such circumstances. In this research, it was found that a friendly and accepting culture is a potential motivator for new or multinational members to share their knowledge with existing members in the project team. Plenty of literature in project management domain points out that the significance of prevalence of multinational project teams in the recent years (Chevrier, 2003; Evaristo and van Fenema, 1999; Prabhakar, 2005; Lientz and Rea, 2002). Furthermore, a number of researchers have claimed that the cultural differences between the nations would deteriorate the members’ intention of knowledge sharing (Ardichvili et al., 2003; Lin et al., 2009; Chen and Hung, 2010; Alazmi and Zairi, 2003; van den Hooff and Huysman, 2009; Hutchings and Michailova, 2004). However, it was discovered in the current study that the members’ acceptance or openness towards the strangers or newcomers would overcome such difficulties. In addition, such an organisational climate would have to foster to promote knowledge sharing in the multinational teams.

To sum up, culture is one of the potential motivators for enhancing knowledge sharing in the project-based organisations. Although much of the extant literature claims that culture is an independent factor of knowledge sharing, the author discovered that the culture of the team or the entire organisation is one of the greatest motivators for the individual members to engage in knowledge sharing. In order to cultivate such
knowledge sharing culture, the suggested five elements should be nurtured in the project teams.

6.2.3.3 Remunerating

It was not a suppressing result that compensating one’s endeavours and behaviours contingent upon any types of rewards such as monetary (e.g. bonus, incentives, vouchers etc.) or non-monetary (e.g. recognition, respect, promotion, or certificate etc.) could be an efficient and effective way of motivating the members to engage in knowledge sharing in the project-based organisations (Cabrera and Cabrera, 2005; Lee and Ahn, 2007; McDermott and O’Dell, 2001; Sharratt and Usoro, 2003; Gagené, 2009; He and Wei, 2009; Yue Wah et al., 2007). Similarly, quite a large amount of the extant literature researches shows the significance and effectiveness of compensation for stimulating the employees in order to make them follow the company-wide activities (Osterloh and Frey, 2000; Bartol and Srivastava, 2002; Bock et al., 2005; Cabrera and Cabrera, 2002; Chiu et al., 2006; Hall, 2001; Hsu and Lin, 2008, Al-Alawi et al., 2007; Ipe, 2003; Lin, 2007a).

The types of rewards in the current study were divided into two types which were physical and psychological remuneration. Prior to collecting and analysing the data, it was assumed that the physical rewards would have a greater influence on the members’ behaviour of knowledge sharing. Yet, the result suggested that the effect of physical compensation would be instant effective and efficient with the short-term perspective of encouragement for knowledge sharing. In order to achieve the long-term success of knowledge sharing in the project teams, psychological remuneration should be cultivated to motivate the employees to take part in knowledge sharing and to become it as a collective action in the firm. These findings of current research are consistent with those of Bock and Kim (2002), who suggested the detrimental influence of extrinsic reward in order to encourage the employees to participate in knowledge sharing. In a similar vein, while a number of researchers claims that the effectiveness and importance of such rewards, they also advise the careful application of compensation contingent on their behaviours (Bock and Kim, 2002; Bartol and Srivastava, 2002; Cabrera and Cabrera, 2002; Riege, 2005).
Moreover, the research finding in this study suggests that team-based or collective remuneration contingent on knowledge sharing would lead to a more favourable result rather than individual-based remuneration. This result accords with the findings of other studies, in which indicated the importance of team-based rewards rather the individual-based compensation (Chiu et al., 2006; Bartol and Srivastava, 2002). For instance, Chiu et al. (2006) suggest that team-based rewards would increase the quantity and quality of the sharing knowledge in the virtual community, while the individual rewards would only be effective on enhancing the quantity of knowledge. The research findings in this study suggest that team-based or collective remuneration is not only useful to make the members engage in knowledge sharing, but also beneficial for the entire organisation to achieve competitive advantage.

It was surprising that the findings show that psychological remuneration would have a far more significant impact on the individuals’ knowledge sharing behaviours rather than physical one. Although the research participants suggested that physical compensation, especially monetary reward, is one of the promptest and most favourable ways to gain the target results in the firm (i.e. In this study, the target is enhancing knowledge sharing between the members in the project teams), they did not prefer to implementing to this methods for motivating their members to share knowledge with others. This finding is in accordance with other researches which emphasises the instant and detrimental effect of such remuneration (Bock and Kim, 2002). For example, Bock and Kim (2002) show rewards systems would become a temporary catalyst to boom up knowledge sharing in an organisation but it could not become a fundamental enabling force for knowledge sharing activities in the companies. Likewise, a large number of academics suggests that the fundamental inducement of knowledge sharing should be intrinsic ones (e.g. esteem, achievement) rather extrinsic factors (e.g. rewards, bonus) (Bartol and Srivastava, 2002; Bock and Kim, 2002; Ipe, 2003; Milne, 2007).

In summary, remuneration is one of the significant aspects of motivation for enhancing knowledge sharing in the project-based organisations. Both remuneration methods are useful to motivate the members to participate in knowledge sharing within the project-based organisations. As other motivators in this research, remuneration should also be conferred on the members appropriately, which should be balanced between physical and psychological remuneration.
6.2.4 Self-efficacy

It was discovered that self-efficacy would be one of essential factors for enhancing knowledge sharing. However, relatively few researches have investigated self-efficacy to enhance the individuals’ knowledge sharing intentions and behaviours in the project-based organisations. Self-efficacy is useful for the individual members to take part in the certain targets with using evaluation and feedback of one’s performance level (Bandura, 1997; Hsu et al., 2007). When the feedback is positive, that is, the one’s performance level is higher, or equivalent to the goal, one would be more confident to engage in the aimed behaviours. Moreover, self-efficacy is potentially important to influence on one’s determination of behaviours to take part in knowledge sharing (Hsu et al., 2007; Bock and Kim, 2002). In other words, people who have high level of self-efficacy would be more favourable to perform the expected behaviours than those with a low self-efficacy (Bandura, 1997; Hsu et al., 2007). While self-efficacy is useful to explain the reasons why members take part in knowledge sharing, few researches have conducted to connect between knowledge sharing and self-efficacy in the project management domain.

Accompanying with these theoretical backgrounds of self-efficacy, knowledge sharing could be achieved by the individual’s high level of self-efficacy. That is, self-efficacy would offer the visible outcomes of sharing knowledge with others by showing the improved organisational performance level as well as the individuals’ expertise. Endres et al. (2007), for example, suggest that self-efficacy is a useful to stimulate the employees to share tacit, complex, and context specific knowledge in high-technology software development companies. Moreover, they show that high level of self-efficacy would be more useful and influential when the person believes his or her ability as well as his or her company’s support system. In addition, one who judges his or her contribution to the positive performance in the firms has more positive attitudes towards knowledge sharing as well as more favourable tendencies to utilise knowledge repositories in the company (Bock and Kim, 2002; Kankanhalli et al., 2005; Hsu et al., 2007). Thus, self-efficacy might be a critical determinant for the individual members’ behaviours to share knowledge with others. Despite the significant role of self-efficacy to promote members to participate in knowledge sharing, the academics in the project
management domain have carried out relatively few researches regarding the relationship between knowledge sharing and self-efficacy.

In this research, the research findings suggest that modelling, experiencing, and persuasion would have three essential features of self-efficacy for promoting members to engage in knowledge sharing in the project-based environment. In addition, self-efficacy would affect the individual member’s motivation to take part in knowledge sharing. These findings of self-efficacy are in accordance with the literature, that is, the individual’s performance would be intensified by high self-efficacy of the individual members (Bock and Kim, 2002; Kankanahalli et al., 2005; Hsu et al., 2007; Gist and Mitchell, 1992). And Gist and Mitchell (1992) suggest a model of self-efficacy, which composes vicarious experience, enactive mastery, and persuasion. The result of this research is closely similar to Gist and Mitchell’s model. The findings in the current study also indicate that the individual who has high self-efficacy in knowledge sharing would have higher personal goals, as well as higher satisfaction and performance. These positive outcomes would be another promoting force for the individual member to share more knowledge with others. Through developing more self-efficacy, both the individual member and the entire organisation would be more knowledgeable and more competitive so it would be possible to achieve sustainable competitive advantage. In this context, self-efficacy would not solely take action to enhance knowledge sharing, but it would take a role closely related to motivation. This continuous effect of self-efficacy is similar to Jashapara’s (2003) study of the UK construction companies, which shows that the double-loop of learning would positively affect the organisational performance.

As a result, the research findings in this study are consistent with the previous studies in other research fields. In other words, the individual’s self-efficacy is one of the crucial elements to enhance the members’ knowledge sharing within and between the project-teams. Although the findings of this study have a number of similarities with previous studies from other research areas, relatively few attentions have been paid in the project management domain. Accordingly, this study would shed light on the significant role of self-efficacy in the project-based organisations. In the following section of the chapter, these findings are dealt with in details.
6.2.4.1 Modelling

It was found that modelling is one of the crucial elements of ‘self-efficacy’ aspect which would strengthen the project team members’ participation of knowledge sharing during and after the projects. Similarly, a number of studies suggest the important role of modelling or showing the example to others for improving the individuals’ self-efficacy (Endres et al., 2007; Bryant, 2005; Das, 2003; Hildreth et al., 2000). For example, Bryant (2005) indicates that the peer-mentoring programme would contribute to increase the degree of knowledge sharing in the software companies by strengthened personal self-efficacy. Although the significant role of modelling, and vicarious experience (Gist and Mitchell, 1992), relatively few researches have conducted to explore the role of modelling aspect of self-efficacy in the project management domain.

This study demonstrated that three key elements of modelling would increase the self-efficacy for promoting the project team members to participate in knowledge sharing: self-confidence; becoming an example to others; and being proud oneself and the company. Likewise, a number of literatures endorse the usefulness of becoming an example to others for increasing self-efficacy (Endres et al., 2007; Bryant, 2005; Das, 2003). For example, Endres et al. (2007) claim that giving examples and the process of role-play would be beneficial to present and share tacit knowledge to others. Furthermore, Bryant (2005) explains that peer mentoring would improve knowledge sharing between the team members by good examples from peers in the company. Although various researchers have emphasised on the role of good examples for high self-efficacy, very little was found in the literature on the functions of self-confidence, and pride of oneself for enhancing self-efficacy. Thus, these two elements for enhancing knowledge sharing are unique findings of knowledge sharing in the project-based organisations.

In summary, modelling is one of the essential features to heighten the project team members’ self-efficacy for promoting knowledge sharing. This finding is consistent with the extant literature, which shows that suggesting good examples should be provided in order to increase the level of self-efficacy to participate in knowledge sharing (Bryant, 2005; Endres et al., 2007; Das, 2003). Although some of the interview participants have stressed the potential role of self-efficacy for enhancing knowledge sharing, it was hardly
to find the relevant materials which deal with the relationship between knowledge sharing and self-efficacy in the project-based organisations.

6.2.4.2 Experiencing

It was found that ‘experiencing’ was one of the aspects of self-efficacy which could increase the members’ participation of knowledge sharing in the project-based organisations. In a similar vein, a number of literatures show that experiencing is one of the positive forces to increase the personal self-efficacy (Endres et al., 2007). In other words, various researchers have confirmed that encountering the certain practices for oneself would have a greater impact on changing his or her behaviours, and perceptions. In this research, experiencing was also categorised into two elements: adopting and personal experiences.

This research indicated that two concepts in this category would enhance the personal self-efficacy for changing one’s perceptions and behaviours to be more optimistic. That is, he or she would more actively participate in knowledge sharing with others in the project teams. In this research, one of the prevalent awareness in terms of knowledge sharing was the negative facet such as losing one’s valuable intellectual assets or competitiveness. Yet, anyone who has ever experienced knowledge sharing takes a positive position towards it. Moreover, these persons would be one of the potential pioneers to disseminate knowledge sharing to the entire firm. Likewise, the extant literature indicates that personal direct past experiences would be a potential facilitator for enhancing the high self-efficacy to share knowledge (Endres et al., 2007). Das (2003), for instance, proposes that the employees’ showing their past experiences of knowledge sharing to others would be beneficial to promote them to take part in it. Similarly, making the employees recognise the usefulness of knowledge sharing would enhance their participation of it as well as increasing the members’ intelligence, empathy, and listening skills (Endres et al., 2007). Despite of such prospective outcomes from experiencing aspect of self-efficacy, relatively few academics have paid attentions to its usefulness for enhancing knowledge sharing in the project-based organisations.
6.2.4.3 Being persuaded

The current study found that ‘persuasion’ is one of the significant elements to enrich one’s self-efficacy for knowledge sharing. In a similar way, various extant literature indicates persuasion as one of the essential features of self-efficacy components would enhance its function of intensified knowledge sharing in the organisations (Lin and Lee, 2004; Gupta and Govindarajan, 2000; Macneil, 2001; Macneil, 2003; Hislop, 2003).

In this research, the members who have been persuaded would more actively participate in knowledge sharing compared to those who have not been convinced. In this context, persuasion does not mean luring or coaxing the employees to change their minds or behaviours, but it would be more broad solicitation which includes praise, recognition, and performance appraisal. For example, the persuasive environment in the team would be more facile to stimulate the members to engage in knowledge sharing (Lin and Lee, 2004). Similarly, research findings of this study also shows that the supportive, and caring supervisor or team members, and their positive attitude toward knowledge sharing behaviours would lead to other members’ positive attitudes and intentions toward knowledge sharing. The present findings seem to be consistent with other research which has found that senior management support would be essential to promote knowledge sharing (Lin and Lee, 2004; Gupta and Govindarajan, 2000; Macneil, 2001; Hislop, 2003). However, it was seldom to discover relevant researches to emphasise the ‘persuasion’ aspect of self-efficacy in the project management domain.

6.3 A theoretical model development

According to Strauss and Corbin (1998), a theory is “a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena”. The major theme, core categories, and relationships amongst them have been analysed in previous chapters. The theory emerged in this research work is explained in this section of the chapter.

6.3.1 The storyline of the theory

As mentioned previously, most of the research participants had defined knowledge management and knowledge sharing based on their experiences. While the definition of
knowledge management varied from person to person, it could be categorised into two broad perspectives from the first set of data: knowledge management is a communication method; and knowledge management in itself means sharing knowledge with colleagues. As the interviews went through, a number of the interview participants underscored the significant role of knowledge sharing in their organisations. Majority of the data indicated that knowledge sharing is the essential process of knowledge management in the project-based organisations. Based on this understanding, the researcher concluded knowledge sharing as the core process of knowledge management in the project-based organisations. Through the analysis of vast amount of the data, the conceptual model of this research was established that ‘knowledge sharing as the core process of knowledge management in the project-based organisations to achieve competitive advantage’. This model composes of several different constructs: the four core categories, thirteen categories, and thirty-seven concepts.

In this study, it was difficult to prioritise amongst the four core categories. For most of the interview participants, knowledge sharing was regarded as an unspoken or unwritten agreement between the knowledge seeker and owner. They considered mutual trust, trust between employees and management, and trust in a project team would play a role which could connect members and overcome unspoken and unseen barriers towards knowledge sharing during a project execution. That is, this action would be possible to take place when the owners of the knowledge expect the future return from the knowledge seeker, and the knowledge seekers believe the owner will offer what he or she needs without any barriers or difficulties. Although it would be difficult to discern priority of core categories in this study, under the circumstance where trust is strong, members can share knowledge, information, and various valuable intellectual assets with other members in the project team. Moreover, the trust for enhanced knowledge sharing is not only from the project team members but also from the management and the company. In other words, a number of research participants’ feared unemployment, when he or she shares valuable knowledge with others. They regarded that sharing meant losing competitiveness as well as the job position. However, the trust between the management and employees would make this situation different. That is, management guarantees employment even though employees share and offer their valuable intellectual assets, which are regarded as a members’ competitiveness. The employees or the project team
members would more actively take part in knowledge sharing, if they attain the trust from the management.

Meanwhile, most of the members in the team would build the interpersonal connection or relationship which would be one of the fundamental resources for getting new knowledge. In this study, the stronger tie with the members, the more tendencies and the more frequencies to share knowledge with others in the project teams and between project teams. In a similar way, when one who has little contact or is a stranger once asks to offer certain knowledge, most of the research participants indicated negative attitudes and reluctance to accept his or her requests. Moreover, based on these positive relationships with others, it would help to build own association or clique in order to pursue more solid and concrete knowledge sharing union for their own benefits. This helps them to learn from others faster and more credible information and knowledge. As well as this, it could save time and money when they acquire new knowledge from others. Undoubtedly, such a positive and strong relationship of knowledge sharing becomes a part of knowledge recirculation and recreation and a way of learning. Therefore, relationship would be one of the significant factors for enhancing knowledge sharing in the project-based organisations.

In addition, lots of the members had already been aware of the significance and its usefulness of knowledge sharing for performance enhancement, prevention to reinvent the wheel, and save time, money, resources, and effort during the project execution. Despite of such greater positive outcomes to sharing knowledge with members, some of them would still be dubious of its practicality and efficiency. In order to stimulate these uncertain users to engage in knowledge sharing, motivation should be applied by various ways. Reduced workload may be one of the significant motivators in attracting them to join knowledge sharing. As lessened work burden would make the project team members take more time to perform other knowledge-related activities such as sharing knowledge, communities of practice, and so forth. Furthermore, the overall culture in the team or the entire organisation would allow them to engage in knowledge sharing more actively and positively. Unlikely to other elements of this study (i.e. trust, relationship, and self-efficacy), culture would influence the individuals’ behaviours unconsciously. That is, one would immerse the overall atmosphere without any enforcement, and he or she would automatically share knowledge as others do in their team. Accordingly, the overall
atmosphere or climate in the team should be one of the important influencers of the members’ participation of knowledge sharing. Along with these motivators, appropriate remuneration would be a catalyst to spur the project team members’ behaviour. Based on the research findings, both methods of remuneration should be applied all together rather than separately. In other words, whilst the physical reward would yield the prompt results, the psychological remuneration would last its usefulness and effectiveness for a long run.

Along with external influencing factors to make members participate in knowledge sharing, personal and internal stimulating forces should be considered to produce more fruitful outcomes of knowledge sharing in the project-based organisations. Self-efficacy, which is one’s faith or belief to carry out a certain task, is an important element for the individual to engage in knowledge sharing. As a result, the quality and quantity of shared knowledge may be far more different from one who has high self-efficacy compared to those of low self-efficacy.

6.3.2 Theoretical implication of this study

The broad review of the literature in the project management domain showed that the studies of knowledge sharing has been relatively unexplored compared to other knowledge-related areas such as learning organisations, implementation of knowledge management, and establishing knowledge management systems. Thus, this study planned to fill this research gap by adopting the grounded theory method which generates theories from empirical data.

During the research project, knowledge sharing was the core process of knowledge management in project-based organisations for personal and organisational performance improvement which would lead organisational competitive advantages. It was also found that the combination of four different elements would make the members in the project team engage in knowledge sharing more actively for personal developments as well as the firm’s performance improvement. The four core-categories are closely inter-related and crucially connected together rather than influencing on separately or partially. One would be able to begin with any of the core categories as the point of departure for knowledge sharing. The decision, which would be the starting point of knowledge sharing, is dependent upon the personal preferences and situations. For example, one
who has a number of relationships with others would select the relationship core category as his or her starting point of knowledge sharing. Then he or she could enhance other core categories of knowledge sharing. Thus, there is no specific starting point of knowledge sharing but one would select any core categories in this research for his or her basis for enhancing knowledge sharing with others in the project-based organisations. In this respect, the model identifies that the relationships among the four core categories are circular rather than linear. Based on the relationships between the core categories, the relational model is depicted in Figure 6.1.

In addition, there are several implications of this research project regarding knowledge sharing within project-based organisations. The first and foremost important implication of this study is that it suggests that the dual natures of each influencing factors towards improved or enhanced knowledge sharing. Most of the extant literatures delineate the potential influencing factors into dichotomy between barriers and enablers. However, the separation of two factors would be difficult and impetuous to take into account several potential elements, especially the core category of motivation. For example, a number of the informants suggested that technology has a significant role and a great impact on increasing the efficiency and effectiveness of knowledge sharing in recent years compared to the conventional methods such as face-to-face contacts, mail systems, and so forth. Moreover, it is true that technology has improved knowledge management and knowledge sharing and few people would deny the role of it. Despite of its usefulness and footprints regarding knowledge management and knowledge sharing, some of the research participants warned people’s over-reliance and over-dependence on technology.
As a result, the success of knowledge sharing in a project team would depend on how to balance ‘the overarching factors’.

Additionally, this research also suggests potential solutions towards difficulties of knowledge sharing. Some of the informants in this study demonstrated useful solutions to such potential difficulties. One of the frequently indicated burdens regarding knowledge sharing is ‘workload’. A number of informants indicated that one of the reasons for not sharing knowledge with colleagues in the project team is abundance of tasks. Due to this reason, some of the members in the project team may consider to ask engaging in knowledge sharing as an additionally imposed work burden. Under such circumstance, the company and the project manager would find it impossible to expect positive outcomes with utilising knowledge sharing. However, if knowledge sharing is integrated in a part of project process, the antipathy and reluctance towards knowledge sharing would be reduced compared to imposition of it. Similarly, Anbari et al. (2008) highlight the importance of the review process and suggest it should become a step of the project life cycle. In order to embed knowledge sharing as a routine of a project team, other motivational elements have a significant role. One of the informants suggested that the foremost and the core of pervasive knowledge sharing are to be open-minded, accepting, and tolerance culture towards all kinds of knowledge. Accompanying with task integration and positive culture, technology would stimulate or make it easy to share variety of knowledge overcoming the temporal and spatial restrictions. Thus, enhancing knowledge sharing would be achieved by composition of suggested core categories and concepts rather than influencing solely.

6.3.3 Integrating theoretical model

A theoretical model of this study is shown in Figure 6.2. According to Strauss and Corbin (2008), they suggest a framework and techniques of labelling conditions, which were stated as, “Labels placed on conditions such as causal, intervening, and contextual are ways of trying to sort out some of the complex relationships among conditions and their subsequent relation to actions/interactions. Causal conditions usually represent sets of events or happenings that influence phenomena… Intervening conditions are those that mitigate or otherwise alter the impact of causal conditions on phenomena… Contextual conditions are the specific sets of conditions (patterns of conditions) that
intersect dimensionally at this time and place to create the set of circumstances or problems to which persons respond through actions/interactions.” (Strauss and Corbin, 2008).

The causal conditions: 1) Motivation, which includes reduced workload, friendly, open-minded and tolerating culture, and remuneration; and 2) trust, which is securing the job positions, sharing good behaviours, and affiliation with similar colleagues. In other words, knowledge sharing could take place in a project team, since members in a project team are motivated by other admirable members, or one who has trustworthiness in both ways (i.e. one has enough knowledge in a certain domain, and one will help me if somebody asks to help.) The intervening conditions of this study include: 1) relationship with other members; and 2) self-efficacy which is one’s belief being able to achieve or useful in the organisation. That is, relationship towards others will determine one’s decision to share or not with others, and one’s self-efficacy will be an important element to make a decision to engage in knowledge sharing. Contextual condition is project-based organisations and specifically, the context of this study is ‘within’ a project team. The major theme which is the major phenomena of this study, is knowledge sharing. It aims to enhance it to gain competitive advantage. In the suggested theoretical model, the researcher presents not only the overall relationship amongst core categories and the major theme, but also the integrated model which indicates the relationships reflecting on causal, intervening, and contextual conditions of this study.
6.4 Summary

This chapter discusses the findings of this study compared with the current literature from various research areas. This process confirmed the findings with the extant literature, and suggested the new insights for enhancing knowledge sharing in the project management research domain. In addition, an integrated storyline of the theory was illustrated. It was useful to suggest the new theoretical model as well as to discuss the findings as a whole. The suggested theoretical model would be the fundamental basis for suggesting the new practical model for practitioners in the project-oriented organisations. In the following chapter, the overview of the research project, reflection of the research, contribution of this study, and limitation and recommendations for the future research will be provided.
Chapter 7  Conclusions and recommendations

7.1 Introduction
The previous chapters provided an explanation of the research processes taken in undertaking this research project, and also showed how it has provided an in-depth understanding of knowledge sharing within project-based organisations. This last chapter reflects on the overall study as well as the review of the research project. First of all, the overview of the research project is explained to recap the entire work during the PhD. Then, methodological reflections and recommendations for future researches deal with in the reflection of the research section. Subsequently, contribution to a theoretical aspect is discussed and then it continues to show its practical implication. Finally, the researcher indicates limitations of this research work and recommendations for future researches.

7.2 The conclusions of the research project
This research work contributes both methodologically and theoretically in project management research discipline. Prior to presenting the contributions of the research, it would be useful to reflect on this study in order to posit and limit it. In this section, the overview of the PhD research is conducted in two aspects: firstly, the overall research process is reviewed, and secondly the outcomes are briefly reconsidered.

7.2.1 Reflection of the research
The research design was based on an inductive approach adopting the grounded theory method through a semi-structured interview technique for collecting the data. All interviews were recorded using a digital recorder for preserving and transferred into verbatim transcripts. The collected data was coded by two different ways, which were analysed by manual and computer-aided coding. The data analysis software package (i.e. NVivo10) was used to aid the qualitative data analysis in this research. Most of the research processes were conducted well. However, some areas did cause problematic situations for the researcher to manage, especially for most of the novice researchers. The problems and solutions in terms of the research method during this study are discussed in the rest of this section.
Firstly, gaining access to the research informants was a frequently encountering difficulty for most of novice researchers. Unlike such researchers, the researcher had achieved access to the studied organisations, and there were rather too many opportunities to select appropriate interview participants of this study. Accordingly, selecting and specifying appropriate interviewees was one of the significant tasks to enhance quality of the research data. As stated in the research methodology chapter, the selected interviewees were responsible for the project managers or project team members. Based on their experiences, they offered useful information to discover knowledge management and relevant activities in project-based organisations. Thus, managing the research sample, which was selecting the relevant interviewees, was an essential step to commence the research project.

Secondly, the use of semi-structured interviews has an advantage of allowing the interview participants to focus on topics and to feel comfortable to take part in the research. Despite these advantages of semi-structured interviews, there were several difficulties conducting the conversations with the participants. Sometimes, the researcher had failed to lead the overall direction of interviews and this situation had caused some distraction and off the topic. This derailed conversation had made the researcher retake interviews with the same person and it was one of the time wasting events during the data collection procedure. In this circumstance, more skilled and experienced researchers were able to balance between listening to participants’ conversation and leading the talks. However, during the initial set of the interviews, the researcher faced difficulties to manage and control semi-structured interviews. As the number of interviews increased, the researcher could control and manage the overall direction of the interviews in an appropriate manner. As a result, initially, the researcher struggled with conducting the interviews since it was the first time to collect data using the interview technique. However, in due course, the researcher managed and controlled the interviews appropriately. Furthermore, the semi-structured interview was a really good approach in order to collect more vibrant and meaningful data from the research participants.

During the data analysis procedure, a computer-aided software package was used called as Nvivo10. It helped to speed up and guaranteed efficient and systematic data management. As more interview data were collected, the researcher had encountered a difficulty in how to systematically manage and efficiently organise the vast amount of
verbal data. The first few interview transcripts were easy to code through a manual approach. However, as the numbers of interviews were increasing, the researcher needed to manage the large amount of data by using the computer-aided support. Along with efficient and appropriate management of the data, NVivo10 also made it possible for the researcher to code and group them together in unified ways. Various functions of NVivo10 made the researcher feel comfortable and relaxed enabling to combine and construct a number of proto-models of this study. Especially, the function of ‘query’ was one of the greatest features of NVivo10 to extract and distil the required information from vast amounts of data.

7.2.2 Conclusions of the research project

A review of the literature in the field of project management studies has shown that the studies of knowledge management in project management context are relatively sparse and limited. This is apparent in comparison to other topics in project management studies such as project risk management, conflict resolution, duration and cost control, project performance improvement techniques and so forth. Based on reviewing the extant literature, this research project explored knowledge management in project-based organisations, which focused on knowledge sharing as the core process in order to achieve improved both individual and organisational performance, and preserve valuable intellectual assets. In order to fulfil the aim of the research project, this study explored the usefulness of knowledge management and knowledge sharing in project-oriented organisations from the different informants in the various project-based firms through in-depth interviews and the grounded theory method. Through this data collection method and analysis technique, this research attempted to provide a fresh, profound and fruitful insight of knowledge management into project management research domain.

In this research, the adopted research methodology, which is a qualitative research method with collecting data from semi-structured interviews and analysing the data using the grounded theory method, was a useful tool to provide in-depth understanding of the current state of knowledge management. Another potential role of such research methods was to explore the status quo of knowledge sharing behaviours in the research involved project-based companies. In Chapter 3, the usefulness and justification of the grounded theory was provided accompanying with the research philosophy, research questions,
research strategies, and paradigms. Although the grounded theory method was a quite challenging approach for novice researchers, it was advantageous for the researcher to understand the current occurrences and phenomena of knowledge sharing in the research participated companies. In addition, the concurrent methods of data collection and analysis in the grounded theory were useful to carry out the time specific research as well as to regenerate fresh ideas regarding the topic.

Chapter 4 not only provided the data collection processes and explained the companies involved in this research project, but also presented the overview of the coding procedures and presentation of discovered constructs of the study. In this chapter, the initial data and initial findings were explained in detail: firstly, knowledge sharing is the core process of knowledge management within project-based organisations; subsequently, the individuals’ reasons for sharing knowledge. Based on the coding procedures in the main data analysis, the concepts and categories, the conceptual model was generated and explained for better understanding. This conceptual model would support the major theme of study, four major factors (i.e. trust, relationship, motivation, and self-efficacy) would influence the enhanced knowledge sharing in project-based organisations. The core categories also encompass a number of categories and concepts which support each core category.

Through the various coding processes and constant comparisons amongst various constructs (e.g. core categories, categories, and concepts), the potential influencing factors of knowledge sharing within project-based organisations were accounted for in Chapter 5. This chapter mainly dealt with the analysis of the data and concluded that relationship, trust, motivation, and self-efficacy were the core categories of this study. Moreover, the comparative analysis amongst the research participated companies were demonstrated in this chapter. During the cross-case analysis, the five research participated firms were compared based on the research findings.

It is required that the analysed data should be examined their positions compared to the extant literature and thus this task was conducted in Chapter 6. In other words, the research findings were evaluated against the extant literature. The purpose of the literature review in this chapter is quite different from the fulfilled work in Chapter 2. While the literature review in Chapter 2 supplied the overall understanding of knowledge
management and explored the status of knowledge management within project-based organisations, the works in Chapter 6 determined the position of this research project within the literature. Moreover, the theoretical model of this study was explained in order to show the value of this research project.

Finally, Chapter 7 showed the review and conclusions of the research project as well as the theoretical and practical contributions. It also provided the limitations and recommendations of the study for the future researches in order to facilitate potential researchers in project management research domain and other relevant disciplines.

Through the aforementioned research procedures, the researcher accomplished the research aim and objectives as follows,

- First of all, a broad literature review was conducted what knowledge management is and what the latest studies of knowledge management from various field of researches such as information and communication technology (ICT), strategic management, business and management and so forth. Through this broad literature review, the researcher was able to establish concrete theoretical backgrounds and research frameworks of this PhD research.

- Moreover, this research focuses on knowledge management and knowledge sharing within project-based organisations. In response to fulfil this requirement, this research also provided an exhaustive review on project management and project-based organisations in order to define its position and to comprehend its significant role in the recent economic environment.

- This research also explored knowledge management and relevant studies (e.g. post project review) in project management research domain. This helped to figure out the most significant process of knowledge management and status-quo studies regarding knowledge management and knowledge sharing in the context of project management.

- Based on the groundwork of this research project, a broad study of research methodology which includes a review of philosophical backgrounds, examination of different research approaches (i.e. qualitative and quantitative research method). Additionally, the researcher explored various data collection (i.e.
interviews, surveys, and observation) and analysis techniques (i.e. case study, the grounded theory, ethnography and so forth).

- Then, the selected research methods, which were semi-structured interviews for collecting data and the grounded theory for analysing the data, were applied to discover constructs (concepts, categories, and core categories). Also, to generate the relevant comprehensive conceptual and practical model for enhanced knowledge sharing within project-based organisations were performed.

- Moreover, the roles and interactions amongst the constructs of the conceptual and practical model were explored. Following this, cross-case comparisons were conducted to evaluate the significance of each construct in the conceptual model across the different types of project-based organisations.

- The findings of this research were evaluated in order to confirm the potential position and role of this study in knowledge management and project management research domain.

- Finally, the researcher not only proposes the theoretical and practical implications of this study, but also suggests future research directions.

As a result of accomplishing the aim and objectives of this research, the findings of this research can be summarised as follows,

- It is indisputable that knowledge is one of the most significant resources in the recent knowledge-based and knowledge intensive economy. Moreover, a number of project-based organisations have been interested in knowledge management in order to preserve a firm’s valuable intellectual assets as well as to prevent repetition of mistakes and reinventing the wheel.

- The research data show that the most significant process of knowledge management within project-based organisations is sharing knowledge with other members in a project team.

- In this study, it was discovered that the potential role of knowledge sharing is not only playing as the core process of knowledge management but also preserving valuable intellectual assets, and obtaining personal and organisational benefits in project-based organisations through the initial analysis of each interview data.
• In order to make project-team members share knowledge more vigorously with others, four elements (i.e. core categories) were considered as significant influencing factors, which were trust, relationship, motivation, and self-efficacy.

• The result of relationships among the core categories, and comparisons among the participating companies suggests that it would be difficult to prioritise which element is more significant than others. However, trust is considered as the basic currency in knowledge sharing transaction amongst members in a project team.

7.3 Contribution of the research

This research project will provide valuable theoretical and practical contributions of knowledge management and knowledge sharing to project management research discipline. Ultimately, this research work will shed some light on the importance of knowledge management in the project management context as well as the emphasis on influencing elements of knowledge sharing between project team members. Theoretical contributions and practical implications of this research project are explained in the following sections.

7.3.1 Theoretical contribution

The first considered aspect of this study is theoretical contributions in project management discipline, specifically knowledge sharing between members within a project team.

First of all, this research project is one of the significant studies, which explored knowledge management and relevant activities in the context of project management discipline. It is also one of the leading studies dealing with the role of knowledge sharing, particularly in project-based organisations. This study highlights the significance of knowledge sharing between members, which would be the most prominent process of knowledge management within project-based organisations. Moreover, this study elucidates the potential influencing factors for enhancing knowledge sharing in project-based organisations rather than discerning barriers and enablers in dichotomy.
The main purpose of this research was to identify the effectiveness and viability of knowledge management within the project-based organisations, and to explore the potential factors to enhance members’ engaging in knowledge sharing. Accordingly, contributions of this research are apparent that knowledge sharing would be considered as the core process of knowledge management within project-oriented firms. Besides, the overall approach to comprehend knowledge management and knowledge sharing of this study is human-centric one rather than a technology-driven approach. This study focuses on the individuals’ determination for participation of knowledge sharing rather than constructing knowledge management systems, or creating knowledge repositories or database. As a result of the research, the underlying four factors, which are trust, relationship, motivation, and self-efficacy, were discovered and they would be able to improve knowledge sharing amongst members in project teams.

Furthermore, this study collected and analysed the data from five project-based companies in three different industries, which were electronic industry, financial and consulting industry, and architecture, engineering and construction industry. This study provided the role of knowledge management from various project-based firms without restricting one industry. Such variety of data collection from different industries would make it possible to broaden the understanding of knowledge management and knowledge sharing in project-based organisations. Moreover, such a variety of industries would provide an opportunity to apply the recommendations of this study in various types of project-based organisations regardless of the industrial types.

In this research, it was evident that the enabling and interfering forces on knowledge sharing exit at a same spectrum. In other words, enabling and constraining factors are similar to a double-sided coin, which means the lack of one aspect would result in negative consequences. Conversely, the overdose of enabling factors would result in side effects such as a detrimental consequence of the target. For example, physical remuneration such as monetary rewards and bonuses has shown to be a prompt and significant motivating element. Yet, over-reliance on it would provoke side effects such as detrimental effects of monetary rewards, and conversion of aims and means (i.e. putting the car before the horse). Accordingly, it is concluded that the terminology ‘knowledge sharing influencing factors or influencer of knowledge sharing’ may be appropriate rather than dichotomy of influencing factors between enablers and barriers.
This research project explored four potential influencing factors to improve knowledge sharing within project-based organisations; firstly, trust is regarded as the foremost factor to enhance knowledge sharing in project-based organisations. There are a number of disputes between trust and relationship, which one is a precedent element to promote knowledge sharing. However, in this research, trust is the most significant element, which would initiate knowledge sharing and determine one’s decision to begin knowledge sharing or not. That is, sharing knowledge is a personal decision to take part in, and one will make a decision that one is trustworthy and then one will change an attitude towards knowledge sharing. After participating in knowledge sharing, one will create positive relationships with others based on knowledge sharing which is derived from mutual or interpersonal trust. Along with trust and relationship, motivation will be a strong and prompt way to encourage individuals to engage in knowledge sharing. In addition, knowledge sharing is significantly influenced by one’s decision, and self-efficacy is a powerful factor to affect his or her choice to share knowledge.

In summary, the theoretical contributions of this research project are as follows:

- It is one of the significant studies exploring the role of knowledge management within project-based organisations.
- It is one of the valuable researches providing the potential role of knowledge sharing within project-based organisations.
- This study provided a fresh insight from five different companies in three different industries rather than limiting one industry or one company.
- This study explored the potential influencing factors towards knowledge sharing which mainly focused on human-centric approach rather than technology-driven approach.
- Four potential influencing factors, which are trust, relationship, motivation, and self-efficacy, were discovered as core categories of this study. Also, several concepts, which are posited as the lower level of, core categories.
- This research showed the dual nature of influencing factors towards knowledge sharing, which would play a role as either enabler or barrier dependent upon the potential users’ utilization.
This study adopted a qualitative research method for exploring knowledge management within project-based organisations. Especially, the grounded theory method was employed to conduct the research for building up substantial theories.

7.3.2 Implication for practice

This study also provides valuable practical implications to the project management domain. Firstly, it is recommended that the emphasis of technology-driven knowledge management should be changed into human-aspect knowledge management. The technology-driven knowledge management emphasises the build of the new systems for storing knowledge and requires investing vast amount of money. On the other hand, the human-aspect of knowledge management deals mainly with motivation and participation of knowledge management. In order to succeed in human-aspect knowledge management, it is recommended that all the members in a company should take part in knowledge management. Majority of the informants of this study commented on the significance of knowledge sharing between the members rather than establishing and storing the knowledge. There are affirmative and robust evidences showing the important role of knowledge sharing as well as the changes of perceptions in terms of knowledge management compared with the past emphasis.

Moreover, many of the respondents had already established and contributed to some kinds of knowledge sharing activities in an unconscious manner. Most of the firms had already constructed high quality of knowledge management systems. However, they did not fully utilise them for certain goals such as improving a firm’s performance, and achieving sustainable competitive advantages. Accordingly, the project-based organisations should appraise the knowledge-related activities and systems rather than establishing a new one for managing and sharing knowledge.

The suggested four influencing factors for enhanced knowledge sharing are not a fixed guideline or an absolute truth. One can freely modify or apply selectively from four of them depending upon one’s situation, also reflecting on a company’s characteristics and situations. Despite this flexibility of application, it is obvious that knowledge sharing will not be achieved by one person or a small group of members in the firm. It will be
achieved by all the members’ participation as well as wholehearted support from management. Thus, anyone who will implement or proliferate knowledge sharing should bear in mind that knowledge sharing is a collective activity rather than a sole or individual movement.

Additionally, this study is a useful guideline to various project-based companies in different industries such as electric, consulting and financial, and architecture, engineering and construction. While this study collected data from five different firms from three different industries, the results of this research would be applicable in various industrial areas where firms run their business units as project-based management.

Briefly, the practical implications of this study summarise as follows:

- It highlighted human-centric knowledge management and knowledge sharing rather than stressing the significance of technologies.
- It discovered that most of the companies have already conducted knowledge sharing activities unconsciously. In this study, exploring the current knowledge sharing activities would be more important than implementing and adopting new approaches to the company.
- The suggested model in this study is not an absolute truth. One can flexibly modify and implement recommendations in this study for one’s convenience.
- The suggested model and recommendations of this study would be applicable to various project-based organisations.

**7.4 Limitations of the research and recommendations for future researches**

The aim of this research was to explore the potential role of knowledge management in project-based organisations. The researcher mainly adopted the grounded theory method for carrying out the research and the interview technique was adopted for collecting the vigorous and diverse information from practitioners in the real settings. Despite numerous advantages with using the grounded theory method, there was a strict time restriction in finishing the PhD research. This means that there will be limitations of this research and recommendations for future researches.
The first and utmost limitation was accrued from the research methodological aspect. There were few of standard procedures and antecedent works adopting the grounded theory method in project management research domain. Thus, it was difficult to determine which the grounded theory methods would be appropriate to this study. Despite of such difficulty in selection of the appropriate grounded theory method, this research vigorously followed the Corbin and Strauss’ suggestion. According to Corbin and Strauss (2008), researchers who adopt the grounded theory method would collect and analyse data at the same time, and he or she may generate new questions from the previous set of data. Accordingly, constant and frequent contact with the research informants would be the fundamental rules of thumb in the grounded theory method. As the researcher understood these basics of the grounded theory method, there were difficulties in following the rule strictly. In other words, whilst the researcher had already recognised the canons of the research method, geographical barriers and time constraints made it difficult for the researcher to follow the principles with a more rigorous manner. Although the researcher modified and applied the overall procedures in this research for its own convenience, it does not mean that the data collection and analysis approaches were different from the suggested method by Corbin and Strauss (2008). Despite of modification of the grounded theory method, this study obeyed data analysis procedures (i.e. open coding, axial coding, theoretical sampling, constant comparisons and theoretical saturation) strictly in order to generate more fruitful and rigorous understanding from the research participants.

Besides, in order to produce the best results with using the grounded theory method, one should take into account more flexible and sufficient time to obtain richer and more fruitful data from the research participants. This was apparent that after carrying out more and more interviews with the same informant regardless of the interview methods (i.e. face-to-face, or email interviews), the acquired data was getting more fruitful and rigorous and affluent compared with the initial interview from them. Thus, building and maintaining a close relationship with the informants would be important for future researchers who would adopt an interview method for collecting data in their research. Briefly, the issues stemmed from the research methodology were the foremost constraints during this research project.
Additionally, the research informants shared five different nationalities (i.e. South Korean, Australian, Chinese, Taiwanese, and Japanese), which meant that they had different mother tongue languages. Some of the interviewees (i.e. especially Australian interviewees) were English-speaking, and they faced no difficulties in expressing and delivering their delicate and sensitive feelings in English. As a result, the researcher was able to analyse the data from these samples without any difficulties. However, there were some language barriers with informants who spoke other languages and where English was their second language. During the interviews with these informants, English was officially used to communicate with the researcher and the research participants. Unlike the Australian informants, it was difficult for the non-English speaking participants to indicate and describe their delicate and sensitive feelings and experiences due to a lack of extensive vocabulary. In this context, this does not mean that they cannot speak English but they are relatively not fluent compared to the Australian interview participants. This language difficulty was one of the research barriers for the researcher to collect more sensitive and vigorous data from the research participants. For instance, some of the interviewees showed their perceptions and awareness of interview questions expressionless in the face-to-face interviews. However, it was quite surprising that when the researcher conducted the follow-up interviews with emails, their explanations regarding the follow-up questions were full of fruitful and in detail indicating their feelings and impressions. Hence, language differences should be carefully considered in order to comprehend and result in valid and reliable data.

Another difficulty that the researcher encountered during the research took place when the researcher carried out the interviews with the informants who spoke Korean. The researcher faced no difficulties during these interviews since the researcher is also an indigenous Korean speaker. Furthermore, the conversations between the Korean speakers were the most convenient, vibrant and robust collecting relevant data from the interviewees. The researcher, however, encountered a problem, when the recorded data were transformed into transcripts. That is, the transcripts in Korean had been translated into English after each interview. The English transcripts had been checked by two different proofreaders, who were bilingual in Korean, and in English. Despite dual processes of verification of the translated materials, it was difficult for some of the paragraphs and sentences to be interpreted perfectly as the same meanings and nuances in English. Furthermore, when the researcher translated the original transcripts into
English, there was a potential risk, that the researcher would intervene and change English vocabularies and meanings. It was an inevitable situation and the researcher tried to become a third party and tried not to manipulate or contaminate the collected data. The problem of translation in qualitative research was considered by a number of researchers (Temple and Young, 2004), and thus any researchers who will conduct researches in different languages should be cautious of a translation problem.

Accompanying with aforementioned difficulties during the research project, the problem was arisen from the data collection procedure. This research was mainly focused on knowledge management in project-based organisations. In order to fulfil the research aims and objectives, six project-based organisations from three different industry types (i.e. a financial service, an electronic manufacturer, and a construction industry) were chosen to carry out the research project. Unlike other research methods, the grounded theory method is a deductive approach, which explore phenomenon and generate theories from the data. Moreover, one of the unique features of the grounded theory method is its sampling method, which is known as theoretical sampling rather than snowball or random sampling. Due to these distinctive characteristics, the number of interviews in this research did not face any problems with the methodological aspect. However, it may be much better to collect more data from different project-based organisations in order to attain generality and applicability. Thus, it is recommended that further researches should be carried out with other types of project-based organisations in order to enhance the research findings and wider applicability.
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Appendices

Appendix 1. The overview of the research plan
Appendix 2: Invitation letter for participating the interview

Dear Sir / Madam,

I am a PhD student studying project management at the School of Mechanical, Aerospace, and Civil Engineering in the University of Manchester. This is an invitation to participate in the study, which focuses on knowledge management activities within the project-based organisations.

I will explain the brief description of your participation in the interview as follows. And the more detailed information in terms of this research project is explained in the attached documents.

The participation of the interview is voluntary. It would involve an interview of approximately 45 to 60 minutes at a mutually agreed location. You can decline to answer any of the interview questions, if you wish. Furthermore, you may decide to withdraw from the study at any time by letting me know.

With your permission, the digital recorder would record the interview, and it would be converted into transcripts for analysis. And if you want, a copy of the transcript will be sent to you. All information you provide is completely confidential, which includes your name, the company name, and any other personal information. Any of data will not appear in the study.

Your responses will be used anonymously and accessed purely for the purpose of the research. If you have any questions or concerns regarding this study, or would like to
have additional information to assist you in reaching a decision of participation, please contact me.

I hope that results of my study will be of particular benefit to project managers as well as all others who are involved in any project-based organisations. I very much look forward to speaking with you and thank you in advance for your assistance with this project.

Sincerely yours,
Seunguk Na

PhD research student
School of Mechanical, Aerospace, and Civil Engineering
The University of Manchester
Oxford Road
Manchester, M13 9PL

Email: seunguk.na@postgrad.manchester.ac.uk
Appendix 3. Information for the research participant

Who will conduct the research?
Mr. Seunguk Na
PhD research student
School of Mechanical, Aerospace, Civil Engineering
The University of Manchester
Oxford Road
Manchester, M13 9PL

What is the aim of the research?
The purpose of this research project is to investigate the perspectives of knowledge management in project-based organisations. The purpose of this research is to make sure a viability of knowledge management and its potential benefits with harnessing knowledge management in project-based organisations.

The research project seeks to draw general perspectives on knowledge management in different industries, an issue that has a strong potential to inform policies and practices on leveraging knowledge and achieving sustainable competitive advantage and so on.

Why have I been chosen?
We are inviting you to take part in this research project, as a professional representing your organisation who we think would be able to provide us with some valuable and fresh insights about knowledge management, learning from others, and benefits from knowledge management. It is at your own discretion to decide whether or not you want to take part.

What would I be asked to do if I took part?
The research will be based on individual face-to-face interviews lasting between 1 to 2 hours. The interviews are intended to uncover your experiences with knowledge management and how they reflect on your organisation. You are not necessarily obliged to disclose any information that you find particularly sensitive or uncomfortable to discuss, and you can call a halt to the interview process at any time.

What happens to the data collected?
The interviews will be audio-recorded for the purpose of analysis. Interviews will also be transcribed verbatim, and saved as encrypted files in the researcher’s computer/laptop based at the University of Manchester.

**How is confidentiality maintained?**

Data will not be disclosed to a third party under any circumstances, and all information will be treated with the strictest of confidence. Where data is used in academic publications, these will be anonymised. Direct quotations will also be selected but identity will still be completely anonymised.

**What happens if I do not want to take part or if I change my mind?**

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself.

**Will I be paid for participating in the research?**

There is no payment for participating in this research.

**What is the duration of the research?**

The interviews are planned to last for one hour, although this is likely to be longer if you have more information to tell us.

**Where will the research be conducted?**

Interviews will be undertaken at a location that is convenient for you. This can be at the researcher’s office, your office or home, or in a public place of your choice.

**Will the outcomes of the research be published?**

It is intended that the analysis will be published in peer-reviewed conferences and journals in addition to the unpublished PhD thesis.

**Contact for further information**

Please contact Mr. Seunguk Na

Email: seunguk.na@postgrad.manchester.ac.uk

Mobile: +44 7830 642 048
What if something goes wrong?

If a participant wants to make a formal complaint about the conduct of the research they should contact the University of Manchester.

The Head of the Research Office,
Christie Building,
University of Manchester, Oxford Road,
Manchester, M13 9PL.
Appendix 4. The participant constant form

I confirm that I have read and understand the information

| **Title of the project:** Knowledge management to achieve sustainable competitive advantage in the project-based organisations |
| **Name of the researcher:** Seunguk Na |

<table>
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<tr>
<th>Please tick the box</th>
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<tbody>
<tr>
<td>I confirm that I have read and understand the information sheet/letter (delete as applicable) dated [insert date] for the above project and have had the opportunity to ask questions</td>
</tr>
<tr>
<td>I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. Insert contact number here of lead researcher/member of research team (as appropriate).</td>
</tr>
<tr>
<td>I understand that my responses will be anonymised before analysis. I give permission for members of the research team to have access to my anonymised responses.</td>
</tr>
<tr>
<td>I agree to take part in the above research project.</td>
</tr>
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<th>Name of participant</th>
<th>Date</th>
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Appendix 5 Interview questions

In the following interview questions are a general guideline of an interview. All the interview questions will be modified and arranged different manner at each interview circumstance. Moreover, more questions will be asked to an interviewees depending upon the informant’s interests, and depth of knowledge.

Part 1: Introduction

This part of interview includes the following;

• Greeting the interviewee and introducing myself
• Asking the permission for recording the interview using a digital recorder
• Briefing the research background and the purpose to the interviewee
• Presenting the overall process of interview

Questions:

• Hello, first of all, I appreciate your participating in my research project. And let me introduce myself to you, my name is Seunguk Na and I am a PhD Research student at the University of Manchester in the UK.
• And I would like to get the permission from you for recording the entire interview. Would you mind my recording the interview by digital recorder?

Part 2: Research background

This part includes the following:

• A brief explanation of the research project which is knowledge management within project-based organisations

Questions:

• Would you mind telling me about yourself and what is your business do?
• Have you heard anything about knowledge management?
• Can you tell me how your company manages knowledge?
Part 3: Main questions

This interview questions includes the following:

**Questions:**

- What your personal opinions in terms of your company’s knowledge management?
- Do you think that knowledge management is beneficial, when you carry out your project?
- Is there any negative aspect of knowledge management during your project or other work?
- What is the most important procedure of knowledge management?
- What would be potential enablers for knowledge management?
- What would be potential barriers for knowledge management?
- Do you have any solutions to the negative aspects of knowledge management?
- If you were a CEO this company, what would you do for enhancing knowledge management in your company?

Part 4. Summary and closing

This section of each interview includes the following:

- Asking the permission of further interview with the interviewee and getting a recommendation for the other interviewees.

**Questions:**

- Do you have any more ideas in terms of knowledge management? It is free to talk anything else relevant to knowledge management.
- If it is alright for you, may I take your email address?
- Is it okay for you me to ask more questions or later follow-up interviews after my analysing this collected data?
- Is there anyone who would give me the information?
Appendix 6. An example of memo

Memo (5/6/14) Damian Campbell

Role shift
Training: Naturally happens
Moving the next step

Graders/grading factors
Performance review
Training
Responsibility: Not at a certain level;
One to three years
Kind: Apprenticeship(s)
Learning:
Communication, studying

Pool/roster to lead the team, working with them

Promotion: Continuous motivation, working with them

Barriers: Under/over
Communicate properly

Appropriate personnel
Appendix 7. NVivo 10 Screenshot
Appendix 8. University research ethics application form

UNIVERSITY OF MANCHESTER

COMMITTEE ON THE ETHICS OF RESEARCH ON HUMAN BEINGS

Application form for approval of a research project

This form should be completed by the Chief Investigator(s), after reading the guidance notes.

1. Title of the research

Full title: Knowledge management to achieve sustainable competitive advantages in project based organisations

2. Chief Investigator

Title: Mr.
Forename/Initials: Na
Surname: Seunguk
Post: PhD research student
Qualifications: MSc, ME, and BE
School/Unit: University of Manchester / School of mechanical, aerospace and civil engineering

E-mail: seunguk.na@postgrad.manchester.ac.uk
Telephone: +44 7830 642048

3. Details of Project

3.1 Proposed study dates and duration

Start date: 20th September 2010
End date: 30th September 2013

3.2 Is this a student project?

Yes/No
If so, what degree is it for?

............................................................................................................................................................................
............................................................................................................................................................................
............................................................................................................................................................................
............................................................................................................................................................................
3.3. What is the principal research question/objective? *(Must be in language comprehensible to a lay person.)*

The main purpose of this research is to investigate on the status quo of knowledge management in mainly project-based organisations. The form of project-based management has been paid significant amount of attentions in the recent years because of its agility, and close relationships with stakeholders. Despite such greater benefits with project-based organisations, relatively few researches have been done to connect knowledge management and project management for achieving sustainable competitive advantage. Base on such situations in project management research domain, this research will fill the gaps between knowledge management and project management.

3.4. What is the scientific justification for the research? What is the background? Why is this an area of importance / has any similar research been done? *(Must be in language comprehensible to a lay person.)*

The concept of knowledge management has been broadly researched in business and management studies as a new paradigm, which knowledge is not the accumulation of know-how, insights and wisdoms but knowledge is one of a firm’s resources or assets to manage for achieving competitive advantages and leading the market (Gant, 1996; Lubit, 2001). Despite conducting many researches in business and management, knowledge management is quite a newly emerging research area in project-based organisations. That is, while lots of researches have concentrated on cost reduction, and timely delivery of projects, relatively few researchers take into account the significance of managing, storing, sharing, and utilising the knowledge during the project execution. However, a number of researchers in the project management domain have paid attention to the importance of managing knowledge, and fairly large amount of researchers noticed its usability and application in this area. Thus, interests of knowledge management are growing, and knowledge management in project management domain should be researched with appropriate manners.

Despite many academics have been stressing the significant role of knowledge management in the recent years, there are also current debates that knowledge management is not a permanent fixture in academic studies for business and management. As past researches such as Total Quality Management (TQM), Quality Circle, and Business Processes Reengineering (BPR) had been proven good examples of fashions of researches in business and management, a number of academics and practitioners have claimed that knowledge management would disappear soon as such studies. In other words, fads or fashions in business and management studies have many spotlights from various academics within the first five years and then the attentions towards them will be diminished rapidly during a couple of years (Ponzi and Koenig, 2002). However, a series of researchers have recognised the importance of knowledge, and it has been a popular subject in philosophy since the ancient Greek era. In spite of such enduring interests of knowledge, approximately only two decades have passed since academics and practitioners in business and management paid attentions to knowledge management (Hislop, 2010). Although theorists have taken considerations to knowledge management since its origin, interests from consultants and services firms, which the main product of this type of industry is knowledge, have declined.
compared to in 1990s. According to Hislop (2010), in order for knowledge management to become and sustain a permanent subject as an academic research, it will be required to explore reasons for prevailing of indifferences amongst these types of knowledge-intensive companies.

In addition, Sharp (2003) indicates three pitfalls to implementing knowledge management and he asserts that companies have to overcome these challenges in order to succeed in knowledge management initiatives or knowledge management projects. Firstly, the return on investment (ROI) knowledge management is relatively less than other management practices, such as reengineering, six-sigma, enterprise resource planning (EPR) and so forth. Moreover, the investments in knowledge management have often exceeded the original budget so many executives are hesitating to implement it. Secondly, there may be countless unused or undiscovered knowledge to gain competitive edges and innovation in an organization prior to adopting knowledge management. However, firms are not willing to discover these valuable assets even though they have not recognised the existence of them. Lastly, knowledge is intangible and difficult to calculate in numbers or other physical methods. Accordingly, the upcoming challenge is we need to assess the true value of knowledge and to establish appropriate systems to measure the value of knowledge.

Despite of critiques and pitfalls regarding knowledge management, researchers have paid attention to exploring and adopting knowledge management to project-based organisations. According to Ajmal and Koskinen (2008), they present two reasons for growing interests of knowledge management in a project-based context. Firstly, the features of recent projects are different from conventional projects, and project managers have to take into account the changed situations. The content of projects has been growing more complex than ever before. Also the products have needed more complicated technical and social relationships with project team members. Secondly, project members need to learn lessons that are already known from others or previous projects to develop new knowledge and enhance competences. Constant learning will make the corporations possible to acquire and assimilate knowledge that resides in organisational memory as well as to sustain competitive advantages. Thus, knowledge management is the only way to adjust these changing situations and achieve a firm’s sustainable success and innovation.

In summary, knowledge management is not an academic fashion or fad. It is actually becoming an institutionalised subject of research in various areas. However, the interests of knowledge management in project-based organisations have paid less attention compared to cost management or duration control. Despite little attentions regarding knowledge management in project management domain, it becomes one of the significant areas of researches, as projects are more complicated and complex. Hence, the researcher will conduct a research that enhances and achieve sustainable competitive advantages utilising knowledge management within project-based organisations

3.5. How has the scientific quality of the research been assessed? (Tick as appropriate)
☐ Independent external review
☐ Review within a company
☐ Review within a multi-centre research group
☒ Internal review (e.g. involving colleagues, academic supervisor)
☐ None external to the investigator
☐ Other, e.g. methodological guidelines (give details below)

*If relevant, describe the review process and outcome. If the review has been undertaken but not seen by the researcher, give details of the body which has undertaken the review:*

I had a regular meeting with the supervisor on a monthly basis. During the regular meeting, I had discussed relevant matters with him.

3.6. Give a full summary of the purpose, design and methodology of the planned research, including a brief explanation of the theoretical framework that informs it. It should be clear exactly what will happen to the research participant, how many times and in what order. Describe any involvement of research participants, patient groups or communities in the design of the research. *(This section must be completed in language comprehensible to the lay person.)*

This research is designed with utilising the grounded theory methods, and the basis procedures of this research method would follow the Corbin and Strauss’ approach. The aim of the grounded theory is to obtain fresh ideas from research participants and the researcher will generate theories from the collected data, which will be the ground for the entire research work.

There are two main reasons for adopting the grounded theory method in this study. Firstly, the grounded theory is useful for a research is unfamiliar with the certain topic or subject as well as he or she is unsure about the results. Since there are limited theoretical backgrounds and frameworks of knowledge management in project-based organisations, the grounded theory method is appropriate to fill the research gaps. Secondly, the grounded theory method is useful for the research to begin with data collection process without any solid theoretical frameworks.

3.6.1. Has the protocol submitted with this application been the subject of review by a statistician independent of the research team? *(Select one of the following)*

☐ Yes – copy of review enclosed
☐ Yes details of review available from the following individual or organisation
   (give contact details below)
☒ No – justify below

3.6.2. If relevant, specify the specific statistical experimental design, and why it was chosen?

Not applicable

3.6.3. How many participants will be recruited?

*If there is more than one group, state how many participants will be recruited in each group. For international studies, say how many participants will be recruited in the UK and in total.*
Due to the unique nature of data collection method on the grounded theory method, it is impossible to specify the number of samples prior to commencing the research work. The sampling method of this research will adopt ‘theoretical or purposeful sampling’ method, which the interview will be conducted until no more concepts or categories will be generated from the gathered data.

3.6.4. How was the number of participants decided upon?

If a formal sample size calculation was used, indicate how this was done, giving sufficient information to justify and reproduce the calculation.

There is no specific number of interviews.

3.6.5. Describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study objectives.

The data collection will be carried out by semi-structured interviews and the data will be coded by manually and computer-aided software package which is called as NVivo 10.

3.7. Where will the research take place?

South Korea, Australia, and the United Kingdom (It will depend on interviewees’ situation.)

3.8. Names of other staff involved.

Dr. Jamshid Parvar (Supervisor)

3.9. What do you consider to be the main ethical issues which may arise with the proposed study and what steps will be taken to address these?

Some of the interview questions will be sensitive because it will include personal experiences and personal backgrounds. That is, there will be a possibility that an interviewee may be opposite side of the current firm’s policies or activities. Under this situation, the interview will be in a difficult situation, if the offered information will be opened to the public without anonymous status. As a result, all the informants’ information will be dealt with secretly and anonymously to protect the interview participants.

3.9.1. Will any intervention or procedure, which would normally be considered a part of routine care, be withheld from the research participants?

☐ Yes ☐ No

If yes, give details and justification

4. Details of Subjects.

4.1. Total Number

I cannot determine the exact number but it will be up to 50 considering the time constrain of finishing the PhD study.
4.2 Sex and Age Range

It will vary from potential informants’ working experience. However, there is no sexual restrictions to conduct this research.

4.3 Type

All the data sources for this research will be human entities.

4.4. What are the principal inclusion criteria? (Please justify)

The interviewees should have more than 5 years working experiences in project-based organisations. Besides, the studied organisations should have implemented knowledge management or similar activities in the firms.

4.5. What are the principal exclusion criteria? (Please justify)

Anyone who cannot meet the minimum criteria of working experience will be excluded. In addition, the interviewees who will not be able to communicate with the researcher with appropriate languages (e.g. Korean, or English) will not be selected for potential informants of this study.

4.6. Will the participants be from any of the following groups? (Tick as appropriate)

- Children under 16
- Adults with learning difficulties
- Adults who are unconscious or very severely ill
- Adults who have a terminal illness
- Adults in emergency situations
- Adults with mental illness (particularly if detained under mental health legislation)
- Adults with dementia
- Prisoners
- Young offenders
- Adults in Scotland who are unable to consent for themselves
- Healthy volunteers
- Those who could be considered to have a particularly dependent relationship with the investigator, e.g. those in care homes, medical students.
- Other vulnerable groups

Justify their inclusion

Not applicable

4.7. Will any research participants be recruited who are involved in existing research or have recently been involved in any research prior to recruitment?

- Yes  - No  ☒ Not known

If Yes, give details and justify their inclusion. If Not Known, what steps will you take to find out?

The researcher will ask this during each interview.

4.8 How will potential participants in the study be (i) identified, (ii) approached and (iii) recruited?
Where research participants will be recruited via advertisement, please append a copy to this application.

The three processes will be grounded on convenience and snowball sampling method (Yin, 2009). Details follow:

Identifying

1. The researcher will first identify networks in UK through internet search.
2. The networks will be checked against the inclusion criteria explained in Section 4.4.
3. Networks will be listed according to their closeness of next meeting.

Approaching

1. The researcher will contact the networks and register to attend the upcoming events.
2. The researcher will inform the network organisers about the purpose of attending the network.

Recruiting

1. The researcher will attend the event.
2. During coffee time for example, the researcher will have a chat with several participants and will speak about his research. The researcher will ask those who are interested in having interview to have their contact details.
3. The researcher will inform participants before they agree to be interviewed about the purpose of the research. The purpose will be explained to participants in lay person language to (1) not to lead to interview biases and (2) not to confuse them with jargons.
4. Later on, the researcher will get in contact with participants via email or phone and will arrange for interviews to be conducted following the event attended.
5. Prior to interview, those who are interested and supplied their contact details will be sent participant information sheet and informed consent form.
6. The researcher will interview participants on the agreed time and in the agreed place.
7. During an interview, the researcher will identify other potential interviewees through the help of the interviewed referrals.
8. The researcher will also use his social networks to reach other networks that meet the inclusion criteria.

4.9 Will individual research participants receive reimbursement of expenses or any other incentives or benefits for taking part in this research?

☐ Yes ☒ No

If yes, indicate how much and on what basis this has been decided

5 Details of risks

5.1 Drugs and other substances to be administered

Indicate status, e.g. full product licence, CTC, CTX. Attach: evidence of status of any unlicensed product; and Martindales Phamacopoeia details for licensed products

<table>
<thead>
<tr>
<th>DRUG</th>
<th>STATUS</th>
<th>DOSAGE/FREQUENCY/ROUTE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

5.2 Procedures to be undertaken
Details of any invasive procedures, and any samples or measurements to be taken. Include any questionnaires, psychological tests etc. What is the experience of those administering the procedures?

Not applicable

5.3 Or Activities to be undertaken
Please list the activities to be undertaken by participants and the likely duration of each

Not applicable

5.4 What are the potential adverse effects, risks or hazards for research participants, including potential for pain, discomfort, distress, inconvenience or changes to lifestyle for research participants?

Not applicable

5.5 Will individual or group interviews/questionnaires discuss any topics or issues that might be sensitive, embarrassing or upsetting, or is it possible that criminal or other disclosures requiring action could take place during the study (e.g. during interviews/group discussions, or use of screening tests for drugs)?

☐ Yes ☐ No

If yes, give details of procedures in place to deal with these issues:

5.6 What is the expected total duration of participation in the study for each participant?

The expected duration of each interview is up to an hour but it will vary from the participants depending upon one’s interests and knowledge.

5.7 What is the potential benefit to research participants?

5.8 What is the potential for adverse effects, risks or hazards, pain, discomfort, distress, or inconvenience to the researchers themselves? (If any)

It is the first time for the researcher to collect data with using an interview method. The novice researcher will have a difficulty to manage unexpected situations such as the interview participant’s few interests and so forth. Furthermore, potential locations of data collection are remote from the original research place. Thus, managing time efficiently will be one of the most arduous matters to deal with the overall data collection procedure.
6. Safeguards

6.1 What precautions have been taken to minimise or mitigate the risks identified above?

Before arranging a meeting, the researcher should make sure the informants awareness of the topic.

6.2 Will informed consent be obtained from the research participants?

☑ Yes ☐ No

If Yes, give details of who will take consent and how it will be done. Give details of the experience in taking consent and of any particular steps to provide information (in addition to a written information sheet) e.g. videos, interactive material.

As mentioned above in section 4.8, participants will be fully aware of the research purpose and the interview will be conducted at their own discretion. In addition, consent form will be signed in writing at the start of the interview.

If participants are to be recruited from any of the potentially vulnerable groups listed in Question 4.6, give details of extra steps taken to assure their protection. Describe any arrangements to be made for obtaining consent from a legal representative.

Not applicable

If consent is not to be obtained, please explain why not.

Not applicable

Where relevant the committee must have a copy of the information sheet and consent form.

They are attached.

6.3 Will a signed record of consent be obtained?

☑ Yes ☐ No

If not, please explain why not.

6.4 How long will the participant have to decide whether to take part in the research?

There is no fixed time as participants are left to decide at their own discretion, however, the researcher will send a reminder via email or text messages if not heard from them more after one week of first contact. Another email or text message will be sent to gently remind them, two weeks after the first email or text.

6.5 What arrangements have been made for participants who might not adequately understand verbal explanations or written information given in English, or who have special communication needs? (e.g. translation, use of interpreters etc.)

Not applicable
6.6 What arrangements are in place to ensure participants receive any information that becomes available during the course of the research that may be relevant to their continued participation?

At the end of an interview, the researcher will ask the participant if he or she would like to be notified via email of any research results that might be of his or her interest.

The researcher will also write up an interview summary. It will be sent back to participants for verification and clarification if requested.

6.7 Will the research participants’ General Practitioner be informed that they are taking part in the study?

☐ Yes ☒ No

If No, explain why not

Not applicable

6.8 Will permission be sought from the research participants to inform their GP before this is done?

☐ Yes ☒ No

If No, explain why not

Not applicable

6.9 What arrangements have been made to provide indemnity and/or compensation in the event of a claim by, or on behalf of, participants for (a) negligent harm and (b) non-negligent harm?

Not applicable

7. Data Protection and Confidentiality

7.1 Will the research involve any of the following activities at any stage (including identification of potential research participants)? *(Tick as appropriate)*

☐ Examination of medical records by those outside the NHS, or within the NHS by those who would not normally have access
☐ Electronic transfer by magnetic or optical media, e-mail or computer networks
☐ Sharing of data with other organisations
☐ Export of data outside the European Union
☐ Use of personal addresses, postcodes, faxes, e-mails or telephone numbers
☒ Publication of direct quotations from respondents
☐ Publication of data that might allow identification of individuals
☒ Use of audio/visual recording devices
☒ Storage of personal data on any of the following:
7.2 What measures have been put in place to ensure confidentiality of personal data? Give details of whether any encryption or other anonymisation procedures have been used and at what stage?

Each interview will be recorded by digital voice recorder and the data will be quickly transferred personal laptop. Transcription work will only be done in personal laptop and university computer. Such methods will make sure leaking or any further breaches of data utilisation.

7.3 Where will the analysis of the data from the study take place and by whom will it be undertaken?

The collected data will be analysed by the researcher at the University of Manchester and the researcher will use the authorised computer.

7.4 Who will have control of and act as the custodian for the data generated by the study?

The researcher

7.5 Who will have access to the data generated by the study?

The researcher and the supervisor

7.6 For how long will data from the study be stored?

7 Years Months

Give details of where they will be stored, who will have access and he custodial arrangements for the data:
All data will be stored on hard drive of the researcher’s computer at his office at the University of Manchester. Data will be accessed by the researcher and the supervisor only as stated above.

8. Reporting Arrangements

8.1 Please confirm that any adverse event will be reported to the Committee

8.2. How is it intended the results of the study will be reported and disseminated?

(Tick as appropriate)

☐ Peer reviewed scientific journals
8.3 How will the results of research be made available to research participants and communities from which they are drawn?

After finishing the initial data analysis, the researcher will send the analysed documents to all the participant in order to make sure the interview participant’s purpose.

8.4 Has this or a similar application been previously considered by a Research Ethics Committee in the UK, the European Union or the European Economic Area?

☐ Yes
☒ No

If Yes give details of each application considered, including:

Name of Research Ethics Committee or regulatory authority:

Decision and date taken:

Research ethics committee reference number:

8.5 What arrangements are in place for monitoring and auditing the conduct of the research?

Will a data monitoring committee be convened?

☐ Yes
☒ No

What are the criteria for electively stopping the trial or other research prematurely?

Not applicable

9. Funding and Sponsorship

9.1 Has external funding for the research been secured?

☐ Yes  ☒ No

If Yes, give details of funding organisation(s) and amount secured and duration:

Organisation:

UK contact:

Amount (£):
Duration: Months

9.2 Has the external funder of the research agreed to act as sponsor as set out in the Research Governance Framework?

☐ Yes  ☐ No  ☒ Not Applicable

9.3 Has the employer of the Chief Investigator agreed to act as sponsor of the research?

☐ Yes  ☒ No

9.4 Sponsor (must be completed in all cases where the sponsor is not the University)

Name of organisation which will act as sponsor for the research:

10. Conflict of interest

10.1 Will individual researchers receive any personal payment over and above normal salary and reimbursement of expenses for undertaking this research?

☐ Yes  ☒ No

If Yes, indicate how much and on what basis this has been decided:

10.2 Will the host organisation or the researcher’s department(s) or institution(s) receive any payment of benefits in excess of the costs of undertaking the research?

☐ Yes  ☒ No

If Yes, give details:

10.3 Does the Chief Investigator or any other investigator/collaborator have any direct personal involvement (e.g. financial, share-holding, personal relationship etc.) in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest?

☐ Yes  ☒ No

If Yes, give details:

11. Signatures of applicant(s)
12 Signature by or on behalf of the Head of School

The Committee expects each School to have a pre-screening process for all applications for an ethical opinion on research projects. The purpose of this pre-screening is to ensure that projects are scientifically sound, have been assessed to see if they need ethics approval and, if so, go to the relevant ethics committee. It is **not** to undertake ethical review itself, which must be undertaken by a formal research ethics committee.

The form must therefore be counter-signed by or on behalf of the Head of School to signify that this pre-screening process has been undertaken.

I approve the submission of this application.

Signed by or on behalf of the Head of School

Date