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**KNOWLEDGE CONVERSION PROCESSES AND LEADERSHIP:
AN EXPLORATORY STUDY OF TAIWANESE MANAGERS**

By

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ABSTRACT

This research explored the extent to which different knowledge conversion processes require different kinds of leadership. The research was inspired by Nonaka and Konno (1998) and proposed that knowledge conversion processes may each require their own form of leadership because they are conducted under different *bas* or contexts. Vera and Crossan's (2004) work provided a foundation for this research through the argument that knowledge conversion processes need not only transformational but also transactional leadership. The leadership framework based upon transformational and transactional leadership was therefore adopted for the study.

Semi-structured interviews and the Multifactor Leadership Questionnaire (MLQ), developed by Bernard Bass and Bruce Avolio to assess leadership under the transformational and transactional leadership framework, were used to gauge the opinions of participants about leadership and knowledge conversion processes. Scenarios/descriptions derived from Nonaka and Takeuchi (1995) were used to focus the mindset of the participants involved in the interviews and the questionnaire, which was administered at the time of the interviews to support triangulation.

Findings suggested that knowledge conversion processes do not differ to the extent that they require both transformational and transactional leadership. However, qualitative evidence indicated that knowledge conversion processes were somewhat different in terms of certain dimensions of transformational leadership. These

differences related to the need for a strong sense of purpose, a compelling vision of the future and long-termism in some but not all situations involving the leadership of knowledge conversion processes.

Keywords: Knowledge Conversion Process, Transformational Leadership and Transactional Leadership.

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1

INTRODUCTION

1.1 INTRODUCTION

The research presented here is concerned with knowledge management and the implications of leadership. The research studied Taiwanese managers. This chapter starts with a discussion of the background and importance of the research presented in this dissertation. Next, attention is directed to exploring the context of this research. The research question and corresponding propositions are then introduced before the contribution of the research is discussed. Finally, the structure of this thesis is presented.

1.2 BACKGROUND AND IMPORTANCE OF THE RESEARCH

It is estimated that in the major OECD countries, more than 50 per cent Gross Domestic Product (GDP) is now knowledge-based (OECD, 1996). As a consequence, knowledge-based jobs are in high demand in those countries because knowledge is now recognised as “the driver of productivity and economic growth” (p. 3). In fact, knowledge has become a major source of wealth creation, making traditional factors like land, natural resources, labour and capital secondary considerations (OECD, 1999). The global economy appears to be in transition from a traditional economy to a new economy which is knowledge-based. In the eyes of some scholars, knowledge has already been seen as a robust source of competitive advantage (e.g. Ambrosini and Bowman, 2001; Argote and Ingram, 2000; Grant, 1996a; Nonaka and Takeuchi,

1995; Nonaka, Toyama and Konno, 2000; Spender and Grant, 1996a). From Drucker's (1999) point of view, knowledge provides a foundation for the sustainable development of developed economies, which have seen knowledge workers gradually supplant manual workers as the primary creators of wealth. Knowledge management has therefore become a priority for national and organisational agendas.

According to the OECD (1999, 2000), the knowledge economy includes industries like aerospace, software, chemicals/biotechnology, information and communications technology (ICT) equipment and services, consumer electronics, consulting, healthcare, education and environment industry. As a matter of fact, some Asian countries made strides into the knowledge economy in the 1990s. Among these countries, Taiwan is particularly interesting and important in relation to its development into a knowledge-based economy.

After being discovered by Portuguese in 1544, Taiwan has been governed by the Dutch, Manchu and Japanese. More recently, Taiwan has attained independence. Through continuous upgrading of its technological capabilities and industry structure, Taiwan has been recognised as a technologically advanced country. Taiwan seems to be able to use its technological and managerial expertise to compete on the same standing as the West, Japan and Korea (OECD, 2000). On 16th May, 2005, the U.S.-based BusinessWeek magazine ran a cover story entitled "Why Taiwan Matters". The article argues that the global economy could not function without Taiwan. This argument is based upon the fact that with the competitive advantages of a strong adaptive ability, a culture of risk-taking and entrepreneurship, skill in innovation and design, and flexibility in satisfying customers' demands, Taiwan has become the world's leading supplier of integrated circuit (IC) chips, laptop

computers, liquid crystal displays (LCD), personal digital assistants (PDA), computer servers and modems (DOIS, 2005). Taiwan has expanded its influence into China, currently the fastest growing economy in the world. According to BusinessWeek (2005), the management and marketing expertise of one million Taiwanese working in China's Taiwanese-owned factories contributes approximately 40% to 80% of China's exports in information and communications hardware.

Taiwan's success depends upon the importance of leadership due particularly to the role of management in securing its current position. Without strong leadership, Taiwan would not have become so important in just a few decades; without sophisticated leadership skills, Taiwanese would not be able to lead millions of Chinese to contribute to its growing economy.

In fact, the explosion of interest in leadership in general has been experienced throughout the world. Instances of successful leadership as well as significant failures of leadership are reported in newspapers, which discuss, for instance, world class and national politicians, CEOs of industry, directors of government or generals (Bass and Riggio, 2006). Although most of the stories appearing in the newspapers talk about people at the top, Bass and Riggio argue that leadership can occur "at all levels and by any individual" (p. 2). Leadership is gaining in importance everywhere. Dame Anita Roddick, the founder of The Body Shop, said in the 2005 Global Leadership Forum that the 1990s was about management, but this century is about leadership.

1.3 BACKGROUND TO THE RESEARCH QUESTION

It has been revealed that knowledge management and leadership are both important

topics. In fact, the knowledge management literature recognises leadership as an important enabler in the knowledge management process. Nonaka et al. (2000), for instance, suggest that leaders should “provide the knowledge vision, develop and promote sharing of knowledge assets, create and energise *ba*, and enable and promote the continuous spiral of knowledge creation” (p. 23). The literature has suggested a particular kind of leadership as appropriate for knowledge management. Again drawing upon the example of Nonaka et al., it has been suggested that leaders have to create conditions of “autonomy, creative chaos, redundancy, requisite variety, and love, care, trust and commitment” (p. 25). If these requirements are considered from the perspective of the theory of transformational-transactional (TF-TA) leadership, leaders supporting the knowledge management process are not depicted as drawing upon narrow transactional characteristics of contingent reward and management-by-exception. The background to this research is that the knowledge management literature has so far tended to argue that leadership is important, and that transformational, rather than transactional, leadership should dominate.

However, this assumption may not be well founded. A general point has been argued by Vera and Crossan (2004) in suggesting a vital role for transactional leadership. For the purpose of the current research, a particular line of inquiry is pursued in order to explore Vera and Crossan’s general point at an empirical level. The inquiry is based upon linking leadership with knowledge conversion processes. Nonaka and his colleagues (Nonaka, 1994; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995; Nonaka et al., 2000) postulate two kinds of knowledge: tacit and explicit. Accordingly, four different knowledge conversion processes can be derived: Socialisation (from tacit knowledge to another kind of tacit knowledge), Externalisation (from tacit knowledge to explicit knowledge), Combination (from

explicit knowledge to another kind of explicit knowledge) and Internalisation (from explicit knowledge to tacit knowledge); generally abbreviated to “SECI” (Socialisation, Externalisation, Combination and Internalisation). Nonaka and Konno (1998) indicate that SECI is based upon four different *Bas* or contexts: originating *ba*, dialoguing *ba*, systemising *ba* and exercising *ba*; corresponding to Socialisation, Externalisation, Combination and Internalisation respectively. The possibility that there may be four different kinds of contexts for the exercise of knowledge may suggest the need for more than one type of leadership.

Inspired by institutional theory, Biggart and Hamilton (1987) argue that leadership research should investigate the impact of “norms, legitimating principles, historical legacies, and other institutional factors on the leadership setting” (p. 437). The basic argument is that social contexts have to be taken into account when considering leadership. In fact, as early as the 70’s, scholars had already pointed out that leadership style may be dependent upon context. For instance, Perrow (1970) claims that leadership style is “a dependent variable which depends upon or follows from something else. The setting or task is the independent variable” (p. 6). In addition to Perrow, other scholars have drawn attention to the importance of contextual factors. Pettigrew and Whipp (1991) make the point directly: leadership is “acutely context sensitive” (p. 165). Similarly, Osborn, Hunt and Jauch (2002) point out that leadership cannot be separated from context because leadership is embedded in context. For them, the reason that context determines leadership, rather than the other way round, is that leaders must be responsive to change. In the words of Biggart and Hamilton (1987), leadership is “a relationship among persons embedded in a social setting at a given historic moment” (p. 439).

The argument that leadership is in fact determined by the context in which it exists explains the reason why SECI processes might require more than one kind of leadership. The rationale behind this argument is as follows: each *ba*, representing a specific knowledge conversion process, can be regarded as one kind of context. Since SECI is made up of four different knowledge conversion processes, entailing four different kinds of *bas*, there may need to be four corresponding types of leadership embedded in these processes or *bas* respectively. Alternatively, if the perspective of transformational-transactional leadership is drawn upon, different levels of each form of leadership may be appropriate for different *bas*. To sum up, the major objective of this research is to conduct an inquiry into whether the SECI process is in need of more than one kind of leadership, contrary to the current view that typically argues that knowledge management can rely upon transformational leadership alone.

1.4 RESEARCH QUESTION AND OUTLINE OF PROPOSITIONS

The research question can thus be summarised: *Do different kinds of knowledge conversion processes require different kinds of leadership?* This research question contains two elements. As regards knowledge conversion processes and leadership respectively, SECI (Socialisation, Externalisation, Combination and Internalisation), and the transformational-transactional (TF-TA) leadership framework form the basis for the research. So in other words, this research is devoted to studying the interaction between the SECI processes and the theory of TF-TA leadership. The propositions which are developed in the literature review suggest that different levels of transformational and transactional leadership styles can be related to each SECI process. For the first conversion process, Socialisation, it is proposed that transformational leadership is needed. For the second conversion process of

Externalisation, it is suggested that transformational leadership is also required. For the third conversion process of Combination, it is argued that transactional leadership is necessary. For the final conversion process of Internalisation, it is proposed that transformational leadership is required. So, although the literature review does not find arguments to support four different kinds of leadership in response to the four *bas* proposed by Nonaka and Konno (1998), the literature review does extend current arguments beyond their tendency to apply universal principles in arguing predominantly for the need to support knowledge management through transformational leadership alone.

1.5 CONTRIBUTION OF THE RESEARCH

The first contribution is that this research discovers that different knowledge conversion processes are in need of different perceptions of leadership at a detailed level and based on qualitative evidence. This is valuable to the literature of knowledge management because it expands the argument of Nonaka and Konno (1998) that different knowledge conversion processes are conducted under different contexts or *bas*. In this case, it will be shown that different knowledge conversion processes conducted under different contexts require different specific characteristics related to leadership. This research seems to be the first to provide empirical support for Nonaka and Konno's idea from the perspective of leadership.

The second contribution is at a more general level and concerns the styles of leadership required by knowledge conversion processes. This research finds that at a general level both transformational and transactional leadership styles are necessary for knowledge conversion processes. This finding makes a contribution to the leadership literature. Basically, it supports the argument suggested by Bass (1999)

that the best leader is both transformational and transactional. More particularly, this research becomes the first to confirm that leadership applied in the context of knowledge conversion process has to be both transformational and transactional. The confirmation that transactional leadership is also of the essence supports the argument by Vera and Crossan (2004) that transactional leadership should also play an important role in knowledge management.

The third contribution is that this research establishes a research approach to show that knowledge conversion processes might be different at a detailed level and that at a more general level knowledge conversion processes require transformational and transactional leadership. The research uses existing materials but applies a relatively novel approach. As regards knowledge management, material from Nonaka and Takeuchi (1995) is adapted for direct use as a research instrument. As regards leadership, the Multifactor Leadership Questionnaire (MLQ, 5x-Short Form), designed by Bernard Bass and Bruce Avolio, is adopted. The material from Nonaka and Takeuchi is used firstly as a basis for interviews and secondly as a focus for the completion of the MLQ. This research can thus develop a greater understanding of the context to which Nonaka and Takeuchi's definitions of knowledge conversion processes are accepted by practitioners, together with their views on leadership, and how different forms of leadership, as defined by the MLQ, can be applied to different contexts, as defined by knowledge conversion processes.

The fourth contribution is that this research provides an opportunity to understand collectivistic managers' opinions about knowledge management and leadership. Differing from most other studies, which are based upon subjects from individualistic cultures, this study relies on subjects from a collectivistic culture. The

importance of this alternative viewpoint applies to future research. If future research studies the extent to which leadership is involved in knowledge conversion processes under other collectivistic cultures, this study can be a useful reference or comparison.

From a practitioner's point of view, this research is also important. First, the research increases practitioners' perceptions of knowledge management. It helps practitioners to realise that knowledge management has different meanings to different kinds of business activities. For instance, Socialisation and Internalisation dimensions of knowledge management are more likely to be involved in the activity of production; Combination and Socialisation dimensions of knowledge management tend to be more associated with the activity of information technology/information system (IT/IS). This research educates practitioners in a way that knowledge management is not a general concept as always been considered by them. Rather, knowledge management is a dynamic concept bringing different meanings to different business activities.

Second, this research provides some understanding of how leadership is applied to the contexts of production and IT/IS. It suggests that leaders in the context of production must have some characteristics such as trusting, displaying a sense of power and confidence, being capable of catching followers' hearts and minds, developing, supporting, rewarding, monitoring, setting targets and using systems to manage followers. This research also suggests that those who are playing the role of leadership in the context of IT/IS, apart from having the above characteristics, also have to be purpose-oriented, long-term and visionary. The implication of this contribution is that top management can use this research to design appropriate leadership training schemes for production and IT/IS managers.

This research has final implication and this applies to production and IT/IS staff. Production and IT/IS managers can rely upon this research to design appropriate reward systems for their subordinates. The research suggests that rewards for production staff should be tangible; and money or bonuses seem to be the most appropriate form. Given that, production managers can reward their subordinates with more pecuniary means. The research on the other hand suggests that rewards for IT/IS staff should be varied. In this case, IT/IS managers have to reward their subordinates with not only tangible means like money or bonuses but also with other means such as providing them opportunities to train abroad.

1.6 STRUCTURE OF THE THESIS

The thesis is structured as follows. Chapter 2 provides a general review of the knowledge management and leadership literature. In this chapter, different approaches to knowledge management and leadership are introduced. The chapter then explains why the frameworks of Nonaka and Takeuchi (1995) and Bass (1985) are adopted for this study. Chapter 3 presents a further literature review by discussing the components of SECI and the theory of transformational-transactional leadership. The chapter then examines the extent to which these two areas interact with each other and accordingly establishes the propositions. Chapter 4 presents the research methods adopted by considering qualitative research, quantitative research and triangulation, and shows how these methods have been applied in previous knowledge management research. Chapter 5 introduces the research strategy of this study. The chapter then details how scenarios/descriptions and Multifactor Leadership Questionnaire (MLQ) were used as research instruments. The chapter explains the pilot study, reveals the findings of two pilot studies and discusses the implications. The main study built upon the pilot studies and continued to adopt a

combination of qualitative and quantitative methods. Chapter 6 addresses issues of reliability and validity as they impact the quantitative element in the main study. Chapter 7 considers the main study's use of qualitative research and discusses the use of software packages in the analysis of the qualitative data. Chapter 8 presents the findings from the quantitative perspective of the study. This chapter provides two kinds of statistical methods (*t*-test and MANOVA), presents the results and discusses the implications. Attention is then turned to analysing the qualitative findings. Chapter 9 considers managers' attitudes towards the elements of transformational leadership. The chapter investigates two groups of managers to see whether and in what ways they are different. Chapter 10 contrasts two groups of managers with each other from the perspective of transactional leadership. Chapter 11 concludes the thesis and presents a discussion. The chapter indicates the extent to which the research findings make a contribution to knowledge and practice and presents suggestions for future research.

1.7 SUMMARY

This chapter explains the emergence of the research idea, outlines the research design and discusses the importance of this research. Attention has been drawn to the importance of the knowledge economy, the position of Taiwan as a knowledge economy and the importance of leadership for Taiwan's success and for the future.

The lack of appropriate linkage between leadership and knowledge conversion processes led to the development of this research and to the research question and the research propositions. The propositions refer to how knowledge conversion processes may interact with transformational or transactional leadership. It has been proposed that this research generates some contributions to knowledge and practice.

First, this research confirms that there are specific differences between knowledge conversion processes in terms of leadership. Second, this research suggests that not only transformational leadership but also transactional leadership are necessary to knowledge conversion processes. Third, this research provides a methodological basis to support the above two contributions. Fourth, this research provides a reference point or comparison for future research in collectivistic cultures. Fifth, this research helps practitioners to have a more appropriate understanding of the idea of knowledge management. Sixth, this research helps practitioners, especially leaders in the contexts of production and IT/IS, realise the kinds of leadership characteristics they should have, allowing top management to design leadership training schemes for them. Seventh, this research provides a foundation for production and IT/IS managers to design appropriate reward systems for their subordinates. The next chapter begins the process of developing the outline presented in this chapter and presents the literature review.

2

LITERATURE REVIEW I

2.1 INTRODUCTION

This chapter presents a background literature review. The chapter starts by introducing the concept of knowledge. Attention is then drawn to outlining the major areas of knowledge management. The leadership literature is then introduced. This background review leads to a discussion of the rationale for combining knowledge management and leadership in the specific way adopted for the study presented in this dissertation. This provides a justification for the choice of specific aspects of knowledge management and leadership which forms the basis for propositions which are developed in the next chapter.

2.2 KNOWLEDGE AND KNOWLEDGE TYPES

There are diverse ways of developing a definition of knowledge. For instance, Alvesson and Kärreman (2001) claim that knowledge is an “ambiguous, unspecific and dynamic phenomenon, intrinsically related to meaning, understanding and process” (p. 995). Alternatively, Tsoukas and Vladimirou (2001) define knowledge as “the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both” (p. 979). However, many definitions build upon the well-known cycle: data – information – knowledge – understanding. Davenport and Prusak (1998) suggest a link between information and knowledge by arguing that knowledge is “broader, deeper, and richer” than

information (p. 5). Definitions of this kind tend to concentrate on the information – knowledge relationship but place this relationship within the kinds of contexts evident in the definitions given earlier in this paragraph by Alvesson and Kärreman (2001) and Tsoukas and Vladimirou (2001). So, for instance, Nonaka and Takeuchi (1995) compare knowledge with information and then conclude that knowledge is about beliefs, commitment, action and meaning. Davenport and Völpe (2001) similarly define knowledge as “codified information with a high proportion of human value-added, including sight, interpretation, context, experience, wisdom, and so forth” (p. 212).

These definitions create difficulties for those who are interested in knowledge management. Grover and Davenport (2001) suggest that knowledge is difficult to manage since it “originates and is applied in the minds of human beings” (p. 6). This points to the difficulty of taking knowledge in isolation from its social context and suggests that managing knowledge is more challenging than managing either data or information. From a broader perspective, Alvesson and Kärreman (2001) argue that problems with existing definitions of knowledge include: ontological incoherence; vagueness; and a tendency to produce an all-embracing perspective. In order perhaps to overcome difficulties arising from defining knowledge in general, the general concept of knowledge has been analysed into more detailed concepts. Of particular importance are the categories of tacit and explicit knowledge, and knowing-how and knowing-what. Each of these will be briefly reviewed below in order to provide a basis for the later discussion of knowledge management. The tacit and explicit categorisation of knowledge is introduced first.

2.2.1 Tacit and explicit knowledge

It can be argued that the most cited and influential perspective on knowledge is Michael Polanyi's distinction between tacit knowledge and explicit knowledge (Nahapiet and Ghoshal, 1998). According to Polanyi, knowledge is tacit when it is "tied to the senses, movement skills, physical experiences, intuition or implicit rules of thumb", whilst knowledge is explicit when it can be "uttered, formulated in sentences, captured in drawing and writing" (Cited in Nonaka, Von Krogh and Voelpel, 2006, p. 1182). Whilst explicit knowledge appears to be relatively straightforward, the concept of tacit knowledge presents a challenge for knowledge management. The concept of tacit knowledge has been held to be sub- and preconscious rather than conscious (Spender, 1996) and, therefore, the essential feature of Polanyi's tacit knowledge is ineffability (Tsoukas, 2005). As a consequence, knowledge which is most easily managed, that which is explicit and expressed in words and numbers, only comprises "the tip of the iceberg of the entire body of knowledge" (Nonaka and Takeuchi, 1995, p. 60). In brief, the central idea of Polanyi (1966) is that people know more than they can tell and this creates a challenge in terms of the management of tacit knowledge.

2.2.2 Knowing-how and knowing-what

Kogut and Zander (1992) suggest that firms need to share and transfer the knowledge of individuals and groups within an organisation, and this knowledge consists of "information" and "know-how". Information is defined as "knowing what something means", and so includes "facts, axiomatic propositions, and symbols". Know-how is concerned with "knowing how to do something" (p. 386). Kogut and Zander argue that this is similar to declarative knowledge and procedural knowledge in computer science. This perspective on knowledge is also adopted by Gourlay (2006), Grant (1996b) and Nahapiet and Ghoshal (1998). Gourlay (2006) presents knowing-how as

contextualised knowledge because it involves interpretation, process and relationships. Nahapiet and Ghoshal (1998) consider that knowing-how concerns practical skills and experience-based knowledge and knowing-what or knowing-that concerns facts and propositions. Grant (1996b) relates knowing-how and knowing-what to the distinction between tacit and explicit knowledge. Knowing-how can be related to tacit knowledge whilst knowing-what is related to explicit knowledge. The greatest challenge for knowledge management thus appears to be the management of knowing-how.

2.3 APPROACHES OF KNOWLEDGE MANAGEMENT

Knowledge and management are two terms that have always been joined together, although some authorities argue that knowledge is not easy to manage (Alvesson and Kärreman, 2001; Davenport and Völpe, 2001). However, since the 1990s, individuals and organisations have started to talk seriously about knowledge management. Basically, there are two reasons for this. Firstly, the foundation of industrialised economies is no longer based on natural resources. Rather, it is now determined by intellectual assets and intellectual capital is of prime importance. Secondly, developments in information technology have impacted firms in significant ways. Intellectual capital and information technology will now be introduced briefly before moving on to consider the implications for knowledge management.

2.3.1 Intellectual capital

Intellectual capital integrates knowing-how (tacit knowledge) and knowing-what (explicit knowledge) (Nahapiet and Ghoshal, 1998). Nahapiet and Ghoshal define intellectual capital as “the knowledge and knowing capability of a social collectivity,

such as an organization, intellectual community, or professional practice”, and intellectual capital represents “a valuable resource and a capability for action based in knowledge and knowing” (p. 245). Similarly, Edvinsson and Sullivan (1996) define intellectual capital as “knowledge that can be converted into value”, implying that it refers not only to technological innovations (e.g., computer programmes, inventions) but also to intellectual properties (e.g., patents, trademarks) (p. 358). Following the idea of John Kenneth Galbraith in 1969, Bontis (1998) proposes that intellectual capital is an ideological process of pursuing effective use of knowledge. In other words, intellectual capital is a means to an end.

Swart (2006) defines intellectual capital in terms of tangible products and services created by individual and collective knowledge and skills. From her point of view, intellectual capital is driven by the interaction between some sub-components, and those sub-components are human capital, social capital, structural capital, organisational capital, client capital and network capital. For human capital, she argues that it has two forms: generic and firm-specific. The former is explicit and is measured by level of formal education and years of working and managerial experience; the latter is mainly tacit to the firm and is measured by “years of firm experience, number of unique projects, team-based solutions (and) unique operational procedures” (p. 140). Also, Swart defines social capital as “relationships within the firm”, structural capital as “structures that facilitate capital integration”, organisational capital as “embedded routines, processes and technologies”, client capital as “relations with clients” and network capital as “knowledge network relationships” (p. 154). She argues that these forms of capital are influenced by each other and accordingly to generate intellectual capital.

Swart's (2006) contribution of "unpacking the definitions and measures of intellectual capital and its sub-components" thus suggests three areas for future research (p. 151). The first is that each sub-component's conceptual clarity needs to be enhanced. She suggests that the terms human capital and intellectual capital should no longer be interchangeable. In addition to human capital, social capital and structural capital also need further clarification. She argues that for social capital, future research needs to focus on "boundaries (of the organisation), levels of analysis and the functions of relationships"; for structural capital, it needs to have a clear cut from organisational capital because "sensitivity to (these two capitals') subtle differences may be important to future research" (p. 152). The second area for future research is that more understanding needs to be made for the interrelationship between the sub-components and more qualitative and quantitative work needs to be done for increasing people's conception of how to manage intellectual capital. Swart suggests that a framework of integrating the sub-components of intellectual capital needs to be established. The third area refers to developing the measurement of the sub-components so that quantitative work can more easily be facilitated. In order to achieve this, Swart suggests reviewing previous measures.

Of the aspects of intellectual capital that have received attention, social capital stands out as the one that is relevant to studies of knowledge management because of its relevance to relationships. This is explored further in Section 2.3.4 below, where relationship-oriented approaches to knowledge management are outlined as an alternative to technology-oriented approaches.

2.3.2 Information technology

The second reason for individuals and organisations to talk seriously about

knowledge management since the 1990s is that due to the rise of information and communication technologies, codifying, storing and sharing knowledge has developed to a point where organisations can manage information “more easily and cheaply than ever before” (Hansen, Nohria and Tierney, 1999, p. 106). Since information is the basis for knowledge, technological developments have thus made it possible to talk in practical terms about the possibility of managing knowledge. Clearly, this line of argument is most appropriate for explicit knowledge or knowing-what. A technology-oriented approach to knowledge management has appeared within the knowledge management literature. This will be considered next, before attention is turned to the implications of the management of relationship-oriented approaches, including social capital.

2.3.3 Technology-oriented approaches

Technology-oriented approaches to knowledge management are facilitated by the information and communication technologies (ICT) which include the internet, intranets, email and the world wide web (Alvesson and Kärreman, 2001). It may even be true that today’s notion of knowledge management is largely dominated by sophisticated corporate information systems (Tsoukas and Vladimirou, 2001). As a matter of fact, the relationship between knowledge management and ICT can be traced back to the 1960s when centralised mainframes were used to process electronic data. In the 1970s, information systems were used to combine data into useful information for the purpose of controlling organisational resources including personnel, money and goods. From the 1980s, due to the birth of personal computer (PC), people turned to decentralised computing technologies to process their own data and information. From a practitioner’s point of view, such technologies can help to increase organisational effectiveness and competitive advantage as long as they

are used strategically (Grover and Davenport, 2001).

Hansen et al. (1999) identify one of the central knowledge management approaches is codification. Knowledge is “carefully codified and stored in databases” so that everyone in the company can access and use the knowledge easily (p. 107). Hansen et al argue that this approach applies to a variety of different organisations, including consulting companies, providers of health care and high-tech companies. Similarly, in Alvesson and Kärreman’s (2001) study, knowledge management is identified with extended libraries. Alvesson and Kärreman argue that this kind of knowledge management approach involves using available technologies, such as databases and information and communication systems, to compile, synthesise and integrate organisations’ internal and external information and then turn it into general, useful knowledge. In this case, knowledge management is considered as a system of database or a library for people who require information.

Drawing upon primary and secondary data, Earl (2001) proposes seven strategies or schools of knowledge management, within which the systems school, based upon capturing “specialist knowledge in knowledge bases (from conventional databases through CD-Roms to expert systems) which other specialist or “qualified” people can access”, is argued to be the “longest established, formal approach to knowledge management” (p. 218). Earl argues that the fundamental philosophy of this approach is to codify domain-specific knowledge, and information technology (IT) plays an extremely important role in the codification process. Indeed, the role of IT in knowledge management has come to be seen to be essential. Scarbrough and Swan (2005) point out that one of the themes within the knowledge management (KM) literature focuses on studying the extent to which IT tools, such as databases and

decision support systems, process, codify and store knowledge. They argue that some authorities believe that IT represents the most important solution to the creation of knowledge. Technology is also used for mapping organisational knowing. For example, Powell and Swart (2005) use a system-based approach to capture the dynamic and systemic qualities of organisational knowing, and this is done by examining “the system context in which knowledge is used and the roles of users and owners of that knowledge” (p. 46).

It can be argued that the tangible investment required for a technology-oriented approach makes it the most straightforward approach to knowledge management and this is its major strength. It seems that as long as money is invested in installing information and communication technologies, knowledge can be stored, shared and otherwise managed. At least for practitioners, this is apparently an easy approach to knowledge management. This perception can be investigated in numerical terms. For instance, \$2.3 trillion is spent each year on IT projects by only U.S. companies, and the spending might be up to \$10 trillion globally (Faraj and Sambamurthy, 2006). However, beyond the evidence of failed IT systems and the IT literature that questions the quantifiable benefits of IT, from a knowledge management perspective this approach ignores the difficulty of managing tacit knowledge. In other words, this approach may only be effective for restrictive kinds of knowledge. This can be seen as the most important weakness of this approach, and it can be argued that this weakness gives rise to the relationship-oriented approach to knowledge management.

2.3.4 Relationship-oriented approaches

A second important approach to knowledge management tends to be more social and relational since it concentrates on the interactions occurring between individuals,

groups or even organisations (Alvesson and Kärreman, 2001). According to Tsoukas and Vladimirou (2001), this approach relies on people's experiences, perceptual skills, social relations and motivation. This approach takes its fundamental underpinning from belief in the importance of community and sees knowledge as "socially constructed, or, more simply stated, as resting in the organizing of human resources" (Kogut and Zander, 1992, p. 385). Where the technology-oriented approaches to knowledge management stress the importance of tangible investment, relationship-oriented approaches centre on the person and inter-personal interactions (Hansen et al., 1999). Hansen et al. argue that knowledge is "closely tied to the person who developed it and is shared mainly through direct person-to-person contact" (p. 107). In this case, where information technology is involved, its role is to help people to communicate, rather than to store and to provide the prime basis for knowledge sharing. Furthermore, Hansen et al. find that companies which emphasise a relationship approach to knowledge management invest significant resources on building networks of people. For example, McKinsey develops its network of people through approaches which include "transferring people between offices; ... supporting a culture in which consultants are expected to return phone calls from colleagues promptly; ... creating directories of experts; and ... using "consulting directors" within the firm to assist project teams" (p. 109).

Given a relational basis for knowledge management, it is perhaps natural that Scarbrough (2003) should examine this approach from the perspective of human resources management (HRM). For Scarbrough, the extent to which knowledge management is successful depends upon the practice of HRM, rather than the implication of information technology. He argues that there are three HRM factors exerting an influence on the knowledge acquired, developed and shared by

individuals. These factors are (1) selection method, (2) compensation strategy and (3) career system. With appropriate selection methods, organisations will be able to integrate different knowledge from different sources of employees. With appropriate compensation strategies, organisations will be more capable of promoting knowledge sharing. With appropriate career systems, organisations will shape employment patterns so that appropriate individuals can work out the way knowledge is acquired and exchanged. From Scarbrough's viewpoint, the combination and exchange of knowledge involves considering "networks of social relationships as a critical resource" (p. 514).

In recent important developments, knowledge management has been pursued at the relational level through Lave and Wenger's (1991) concept of communities of practice. Community is organic and it is associated with caring and social relations (Alvesson and Kärreman, 2001). Alvesson and Kärreman argue that to encourage knowledge sharing in a community, management can only play a small role of influencing community climate. Rather than managing knowledge through relationships based upon authority, community itself impacts the ways in which knowledge develops. It is the way people work, learn and innovate that is affected by communities-of-practice (Brown and Duguid, 1991). Knowledge is shared and shaped through networks of people who have similar interests (Davenport and Völpe, 2001; Grover and Davenport, 2001). This concept of community is in line with Earl's (2001) "organisational school" of knowledge management. This describes the use of organisational structures or networks to share or combine knowledge. Earl calls such networks "knowledge communities"; and he argues that knowledge communities can be intra- or interorganisational. Those who are in such communities have the same interests, problems or experience. According to Earl, there are two critical success

factors for knowledge communities. First, they tend to work well where there is “a tradition of sociability and networking”, and second, they require a “human hub (or moderator)” to play the role of network switch (p. 225).

Communities of practice provide a vital means through which social capital can be developed. Nahapiet and Ghoshal (1998) argue that social capital tends to facilitate the creation of intellectual capital, comprising knowing-how (or tacit knowledge) and knowing-what (or explicit knowledge), and describe the capabilities that are necessary to social capital. To compete with other institutions in a highly competitive environment, Nahapiet and Ghoshal suggest that organisations must have special capabilities for creating and combining knowledge. From their point of view, there are three factors determining the development of these capabilities. First, organisations must have the ability to create and transfer tacit knowledge. Second, organisations must be equipped with organising principles. With such principles, organisations should be able to structure, coordinate and facilitate communication between individuals. Third, organisations must be seen as social communities.

Inspired by Bourdieu (1986), Nahapiet and Ghoshal (1998) define social capital as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (p. 243). Inkpen and Tsang (2005) argue that this definition contains two levels of social capital: private and public. They say that although these two levels are distinguished, they are often interrelated. For instance, organisational social capital will be built upon individual social capital as long as a manager can use his or her own connections to help the company set up a relationship with another company. Three dimensions of social capital are thus suggested by Nahapiet and Ghoshal

(1998), and they are structural, cognitive and relational. Coleman argues that these dimensions have two characteristics in common: firstly, they “constitute some aspect of the social structure”; and secondly, they “facilitate the actions of individuals within the structure” (Cited in Nahapiet and Ghoshal, 1998, p. 244). At its most basic level, social capital “inheres in the relationships between and among persons and is a productive asset facilitating some forms of social action while inhibiting others” (p. 245).

The structural dimension of social capital involves network ties, network configuration and appropriate organisation or network stability (Inkpen and Tsang, 2005; Nahapiet and Ghoshal, 1998). According to Nahapiet and Ghoshal, this dimension facilitates intellectual capital through “the ways in which its various facets affect access to parties for exchanging knowledge and participating in knowing activities” (p. 251). For the cognitive dimension of social capital, Nahapiet and Ghoshal argue that it can be explained by the perspectives of shared codes and language and shared narratives, but Inkpen and Tsang (2005) claim that it can be analysed from the perspectives of shared goals and shared culture. Nahapiet and Ghoshal’s (1998) argument is that shared codes and language can provide a platform for people to share and exchange knowledge. As to shared narratives like myths, legends, stories and metaphors, the authors believe that they can do the same thing as shared codes and language. This is because through such processes, new interpretations of myths, legends, stories and metaphors may be created, implying that different combinations of knowledge are facilitated. For Inkpen and Tsang (2005), organisational members can have similar perceptions and understandings of relevant ideas and resources through shared goals or visions; suggesting that their knowledge can be more integrated. It can be argued that shared culture will have the

same implication.

With regard to the relational dimension of social capital, Nahapiet and Ghoshal (1998) argue that it is the most significant dimension of social capital. Among the facets of this dimension, including trust, norms and identification, Inkpen and Tsang (2005) believe that trust is the most critical because it influences the extent to which network members are willing to share their knowledge. From Nahapiet and Ghoshal's (1998) viewpoint, trust encourages people to exchange intellectual capital and encourages people to take risks in such exchanges. Moreover, Nahapiet and Ghoshal point out the importance of norms, obligations and identification. The authors argue that norms of cooperation, teamwork, openness to criticism and tolerance of failure can build a strong foundation for the creation of intellectual capital. As regards obligations, as they represent "a commitment or duty to undertake some activity in the future", Nahapiet and Ghoshal believe that obligations will influence "both access to parties for exchanging and combining knowledge ... and the motivation to combine and exchange such knowledge" (p. 255). Identification will have the same result as obligations because it "enhances concern for collective processes and outcomes, thus increasing the chances that the opportunity for exchange will be recognized" (p. 256). To sum up, social capital facilitates intellectual capital by influencing the conditions required for exchange and combination to happen.

Compared with technology-oriented approaches, relationship-oriented approaches are more complex because they involve a wide range of issues, including organisational culture, network of people, HRM policy, relationship between organisational members and organisational norms. These issues are highly correlated

and none can be seen as independent from the others. However, it seems that the reality of relationship-oriented approaches can be found in all organisations. As such, it can be argued that the major strength of this approach is that it can apply to any kind of organisation. Unlike the technology-oriented approaches, that may require substantial investment in information technology, these approaches almost seem to need no extra resources. These approaches appear to only require the transformation of the existing context so as to make it facilitate trust and care. And yet there is a major resource implication in that the involvement of top management is required in order to create an appropriate environment. Additional disadvantages are also evident. Firstly, it may be difficult to measure the extent to which knowledge is facilitated. This is because knowledge is facilitated by social means, which may be less amenable to measurement than technological means. Secondly, the effects of this approach may not be readily apparent in the short term. Where managers face short term pressures of capital markets and performance measurement systems, technological approaches that give rise to evident and measurable knowledge management outcomes may appear to be more attractive.

2.3.5 Nonaka and Takeuchi's approach

It can be argued that both the technology-oriented and relationship-oriented approaches are partial since each concentrates only on one aspect of knowledge management. This section introduces an approach that can be argued to provide a more comprehensive understanding of knowledge management. Proposed by Ikujiro Nonaka and his colleagues, this approach emphasises the importance of context and the fundamental point that knowledge is context-specific (Nonaka and Toyama, 2002; Nonaka, Toyama and Konno, 2000a; Nonaka, Toyama and Nagata, 2000b). In their knowledge-creating theory, Nonaka and Takeuchi (1995) argue that

knowledge is “a dynamic human process of justifying personal belief toward the “truth”” (p. 58). To what extent can true belief be justified? From Nonaka et al.’s (2006) point of view, it is justified through individuals’ observations of the world. In the eyes of Nonaka et al. (2000b), knowledge is not only context-specific but also dynamic; and relies on particular time and space considerations. Without context, there will be no knowledge (Nonaka and Toyama, 2002). This is because knowledge represents a reality that is explained by a particular context. Knowledge is created through “the dynamic interactions among individuals and/or between individuals and their environments” (Nonaka et al., 2000b, p. 3). As such, it can be argued that the process of knowledge creation is “deeply contextually embedded” since it can be seen as a continuous process through which “one overcomes the individual boundaries and constraints imposed by information and past learning by acquiring a new context, a new view of the world and new knowledge” (Peltokorpi, Nonaka and Kodama, 2007, p. 50; Nonaka et al., 2006, p. 1182). Likewise, Nonaka et al. (2000a) indicate that to create knowledge, one has to transcend the boundary “between self and other, inside and outside, past and present” (p. 13). In brief, knowledge-creating process can be seen as a “social process of validating truth” (Nonaka and Toyama, 2005, p. 422). Under these circumstances, how is knowledge created? They argue that knowledge is created through a “continual dialogue” or spiralling interaction between tacit knowledge and explicit knowledge (Nonaka, 1994, p. 15; Nonaka and Konno, 1998).

So, what are the prerequisites or fundamental conditions for knowledge to be created? Or, what is the context for knowledge-creating activities? According to Nonaka and his colleagues, the context for knowledge creation is called *ba*, a Japanese conception which roughly means “place” (e.g. Nonaka and Konno, 1998; Nonaka

and Toyama, 2002; Nonaka et al., 2000b). From Nonaka et al.'s (2000a) viewpoint, the nature of *ba* is complicated and changing all the time. Nonaka et al. (2000b) and Peltokorpi et al. (2007) define *ba* as a shared context in motion since it is constantly evolving and it allows knowledge to be shared, created and utilized. This means that subjective views are “understood and shared in the relationship with others (Nonaka and Toyama, 2005, p. 428). Since *ba* can be physical (e.g., an office), virtual (e.g., email, teleconference), mental (e.g., shared experiences, ideals) or any combination of these (Nonaka and Konno, 1998; Nonaka et al., 2000a), participating in *ba* involves a range of activities, including, “knowledge creation, dialogue, adapt to and shape practices, and simultaneously transcend one’s own limited perspective or boundaries” (Nonaka et al., 2006, p. 1185).

Nonaka and Konno (1998) and Nonaka et al. (2000b) argue that *ba* exists at various levels and these levels may join together and then form a bigger *ba*. In the eyes of Peltokorpi et al. (2007), *ba* refers to the relationship among people in a specific time-space. *Ba* allows participants to share time and space, but it is not bound to a certain space and time (Nonaka et al., 2000a, 2000b). To sum up, it can be argued that *ba* is essential to knowledge creation because it provides a shared platform for the development of individual and/or collective knowledge (Nonaka and Konno, 1998). Nonaka and Toyama (2002) make a clear statement regarding the function of *ba* in knowledge creation. They say that *ba* offers “the energy, quality and places to perform the individual knowledge conversions and to move along the knowledge spiral” (p. 1001). Nonaka and Toyama (2005) argue that the foundation of knowledge-creating activity is *ba*.

It can be argued that Nonaka and his colleagues provide a holistic perspective of

knowledge management. From their point of view, knowledge is dynamic and evolving. It is dynamic because according to Nonaka et al. (2006), knowledge represents the capacity to “define a situation and act accordingly” (p. 1181). It is evolving because new situations always appear and may become more and more complicated, suggesting that the capacity to define and act in accordance with situations has to keep improving. Due to the authors’ emphasis on the interaction between knowledge creation and *ba* or context, and the notion that context may exist in any form, knowledge management must be associated with other disciplines. Nonaka et al. suggest findings from studies in areas such as leadership, entrepreneurship and organisational failure are relevant to the development of *ba* but are still largely unexplored.

Nonaka and his colleagues’ notion of knowledge creation may have some strengths, but there are also weaknesses. Firstly, they are not able to show a consistent and unambiguous relationship between knowledge creation and organisational effectiveness. This point can be illustrated by discussing the specific knowledge conversion process that is known as socialisation. Socialisation is concerned with the tacit-to-tacit knowledge conversion process. Nonaka and Takeuchi (1995) show that socialisation is associated with organisational effectiveness in one specific situation – the development of a bread-making machine. Yet this illustration is problematic. First of all, does the effectiveness brought by socialisation apply only to this situation? Is socialisation involved in other forms of production like car manufacturing? If so, how and in what way is this process relevant to other kinds of production? It seems that Nonaka and his colleagues only focus on the application of socialisation to bread-making machines and fail to apply this process to other forms of production. The second problem associated with this illustration is that if the development of

bread-making machine results solely from socialisation, as it appears to do from the way that the illustration is presented, then this illustration contradicts a point that is argued later in the book. Here they argue that “organizational knowledge creation is a spiral process” (p. 72). If it is claimed as a spiral process, the effective development of bread-making machine should not involve just one kind of knowledge conversion process. Nonaka and Takeuchi seem to provide no explanation for this apparent contradiction.

The second weakness refers to the way that Nonaka and his colleagues perceive knowledge. In their theory of knowledge creation, they only take tacit knowledge into consideration where such knowledge can be converted into other forms of knowledge. They ignore tacit knowledge that cannot be converted (Gourlay, 2006; Tsoukas, 2005). In this respect, their definition of knowledge is narrow. They claim that knowledge is valid only when it is justified by someone’s values, ideas and contexts. Under these circumstances, it can be said that knowledge is meaningful only to certain people at certain times. If so, it may be argued that it would be meaningless to share or exchange someone’s knowledge because their context-specific knowledge may not apply to other people who experience different contexts. In other words, for some people, a particular piece of knowledge may be valuable, but for others, the same knowledge may not be valuable. This weakness reflects the fact that the notion of knowledge creation developed by Nonaka and his colleagues may be difficult to apply at a universal level.

Ambiguity is the third weakness of Nonaka and his colleagues’ theory of knowledge creation. Firstly, the Japanese notion of *ba* is ambiguous. *Ba* can exist in any physical, virtual or mental form. Based on this argument, it would be very hard to describe

precisely what *ba* is because *ba* can exist anywhere or nowhere. Such ambiguity may bring obstacles to the development of theory. For instance, it makes the management of knowledge and its subsequent evaluation difficult since if *ba* exists anywhere, this means that knowledge could be created anywhere in an organisation. No guidance is provided as to how the necessary processes can be facilitated in practice. In addition to the ambiguity that surrounds *ba*, the process by which knowledge is converted is also ambiguous. Let us again take socialisation as an example. At a basic level, it seems very difficult to define exactly what this process involves as it is concerned with converting something implicit into something else that is also implicit. Nonaka and Takeuchi (1995) provide illustrations that indicate that socialisation occurs in brainstorming camp and the interaction between product developers and customers. They fail to explain why socialisation is more likely to occur in these situations than in others, and they fail to explain how these two situations relate to their other illustrations, discussed earlier, of the socialisation that occurred in the development of a bread-making machine.

Lack of explanation for the underlying processes is the fourth weakness of Nonaka and his colleagues' theory of knowledge creation. For instance, it is not fully explained why the dichotomy of tacit knowledge and explicit knowledge is used in their framework. According to Nonaka and Takeuchi (1995), knowledge is about beliefs, commitment and meaning because it concerns with human action. So, as knowledge is relational and is "a function of a particular stance, perspective, or intention" (p. 58), how can it be simply divided into either tacit or explicit? In other words, is the underlying conceptual framing in terms of tacit and explicit knowledge too easy and arbitrary? It seems that Nonaka and his colleagues overlook other forms of knowledge like knowing-how or knowing-what to interpret knowledge

management. They also fail to explain why knowledge conversion processes are positioned in the way that they are presented. Nonaka and Takeuchi (1995) argue that tacit knowledge is the key source of new knowledge. If so, does it necessarily follow that knowledge conversion has to begin with tacit-to-tacit conversion? Why not begin with explicit-to-tacit conversion as new tacit knowledge is also produced in this process (Gourlay, 2006)? Nonaka and his colleagues do not justify why socialisation has to be a starting point.

Having introduced knowledge management, attention will now turn to leadership as this research is about elaborating the relationship between the two areas of knowledge management and leadership.

2.4 LEADERSHIP AND ITS THEORIES

Leadership is a subject that draws people's attention. Some argue that it is probably the oldest concern in the world (House and Aditya, 1997; Tirmizi, 2002). Nevertheless, despite the fact this subject has excited interest for a long period of time (Yukl, 2006), it was until the early 1930s that people started to study leadership systematically (House and Aditya, 1997). In the last few decades, however, leadership has become one of the most central and important subject in the management and organisational behaviour literature. Books, articles and papers on the subject of leadership now total several thousands, and the publication of new materials still carries on at high speed (Yukl, 1989). According to Yukl, specific areas of leadership research have been various, including management, public administration, psychology, political science and educational administration. Even so, the levels of analysis tends to focus on individuals, dyads, groups and organisations (Yammarino, Dionne, Chun and Dansereau, 2005). These concerns and relationships

have developed in discernable phases. The next section begins a review of the leadership literature by considering the first phase – trait approach.

2.4.1 Trait approach

The basic assumption of this approach is that great leaders are born, not made, since they are gifted and can be characterised by unique qualities that differentiate them from other people (Horner, 1997; Tirmizi, 2002). Due to this emphasis on leaders' personal attributes, studies during the 1930s and 1940s were thus conducted to discover these attributes, which included personality, motives, values, skills and emotional stability, together with personal characteristics, including gender, height, physical energy, intelligence and appearance, that may influence the attributes (House and Aditya, 1997; Yukl, 1989, 2006). One of the most influential pieces of research to be produced was conducted by Stogdill in 1948 (House and Aditya, 1997). He reviewed 124 trait studies from 1904 to 1948 and discovered relevant traits like “intelligence, alertness to the needs of others, understanding of the task, initiative and persistence in dealing with problems, self-confidence, and desire to accept responsibility and occupy a position of dominance and control” (Yukl, 2006, p. 182).

Stogdill's review eventually failed along with other trait-related studies. Researchers discovered no consistent relationship between traits and leadership behaviour and effectiveness (Horner, 1997; Yukl, 1989). In other words, they failed to find out which particular traits should be possessed in order to be a successful leader (Yukl, 2006). Also, they ignored situational and environmental factors which were increasingly seen to be important. Situational and environmental factors may be necessary to ensure a leader's level of success (Horner, 1997; House and Aditya, 1997; Yukl, 2006). House and Aditya (1997) indicate two more problems associated

with the trait approach. First, researchers in this field had little “empirically substantiated personality theory” to help them searching for leadership traits (p. 410). Second, methods that would allow rigorous testing of theory were under-developed. As a consequence of these problems, the trait approach failed to make progress and was subsequently largely abandoned.

However, it should be noted that the trait approach re-emerged in the early 1970s. According to House and Aditya (1997), this is due to two reasons: first, several theoretical issues had been clarified; and second, empirically supported traits had been developed. Compared with the earlier approach that focused on personal traits and general intelligence, the re-emergence of the trait approach concentrated on managerial motivation, specific skills and measurement techniques (Yukl, 1989, 2006). Yukl (1989) indicates that researchers in the 1970s were more willing to relate traits to “specific role requirements for different types of managerial positions” (p. 260). Among those researchers, Stogdill conducted a further review of 163 trait studies in 1974. Yukl (2006) argues that although Stogdill included more empirical studies, more traits and more measurement techniques, he still could not find any evidence of universal leadership traits because some traits only applied in specific situation. Nevertheless, important findings have resulted from trait-oriented research. Firstly, some traits were consistently found to be related to leadership effectiveness, including “energy level and stress tolerance, self-confidence, internal control orientation, emotional maturity, and integrity” (p. 209). Secondly, the effects of traits on leadership effectiveness were increased by “the relevance of the traits to the situation in which the leader functions”. Thirdly, traits would have a stronger influence on leadership behaviours as long as the situational characteristics allow individual dispositions to be articulated (House and Aditya, 1997, p. 418).

2.4.2 Behaviour approach

Beginning in the early 1950s, the emergence of the behaviour approach to leadership studies resulted from disenchantment with the trait approach (Yukl, 2006). Those who were come to adopt this approach no longer showed interest in what leaders are; rather, they showed interest in what leaders actually do. The central concern was to investigate how leadership behaviours impact managerial effectiveness (Tirmizi, 2002; Yukl, 1989, 2006). The concern for managerial effectiveness has grown in influence within leadership research (and since the 1950s, leadership research has in general increasingly been interested in “the attributes, actions and attitudes” of supervisors, managers or chief executives in terms of their influence on subordinates’ performance and satisfaction (Bresnen, 1995)). Hundreds of studies have resulted that have studied leadership behaviours, using a variety of research methods, and the relationship with effectiveness. It can be argued that the most famous groups of investigators were members at Ohio State University and the University of Michigan (Horner, 1997; House and Aditya, 1997).

The major contribution from the members at Ohio State University was that they identified two broad categories of leadership behaviours, which were labelled consideration and initiating structure (Horner, 1997; Tirmizi, 2002; Yukl, 2006). These have alternatively been labelled person-oriented behaviours and task-oriented behaviours (House and Aditya, 1997), or relationship-oriented behaviours and task-oriented behaviours (Yukl, 1989). The contribution of researchers at the University of Michigan was to add one more category, namely participative leadership behaviours (Tirmizi, 2002). Normally measured by the LBDQ (Leader Behavior Description Questionnaire), Yammarino et al. (2005) argue that consideration and initiating structure are two independent leadership styles. Within

the LBDQ, leaders could have four combinations of consideration and initiating structure styles: low-low, low-high, high-low and high-high. Leaders with high scores for consideration would be more likely to satisfy subordinates' needs, listen, defend their interests, consult on important issues and treat subordinates as families. High scores for initiating structure indicated that leaders would tend to be more challenging, criticising and demanding on the job since their main concern centred on accomplishing the task (Yukl, 2006).

As regards participative leadership, Zaccaro and Horn (2003) argue that it is similar to the first element in the consideration and initiating structure framework in focusing on the interpersonal relationships between the leader and followers. However, Yukl (2006) claims that participative leadership should be considered as a distinct third category of behaviour. According to Yammarino et al. (2005), this category involves understanding a leader's choice of behaviours through various decision procedures. Although the best decision procedure has not yet been defined, appropriate procedures for effective leadership have been identified as: autocratic, consultation, joint decision and delegation (Yukl, 2006). The choice of the most appropriate procedure differs from time to time; suggesting that a certain procedure may result in higher performance and satisfaction on one occasion but may not do so on other occasions (Yammarino et al., 2005; Yukl, 1989).

The behaviour approach has been criticised under four arguments (House and Aditya, 1997). Firstly, it lacked theoretical concepts. Secondly, it was based upon limited measurement techniques. Thirdly, questionnaires were shown to experience problems of validity. Fourthly, there was little consideration of the context in which leaders worked. House and Aditya argue that these problems are similar to those of the early

approach to trait studies. To sum up, several studies based upon a behaviour approach were conducted from the 1950s to the mid-1980s using questionnaires, critical incidents, laboratory experiments or field experiments to examine how leadership behaviours influence subordinate performance and satisfaction, and results from these studies appeared to be inconclusive (Yukl, 2006).

2.4.3 Contingency theories of leadership

Developed in the late 1960s, contingency theories of leadership proposed that the effectiveness of a leader's behaviours and his or her leadership styles must be determined by the conditions of the situation (Fry, 2003; Tirmizi, 2002). It can be argued that these contingency theories were informed by the previous trait and behaviour approaches to leadership studies. As Zaccaro and Horn (2003) point out, the two constructs of task-oriented leadership style and relationship-oriented leadership style were adopted by one of the contingency theories of leadership (Fiedler's contingency theory). This set of studies sought to investigate how leadership effectiveness is affected by the interaction between leaders' attributes and situational parameters. In other words, these theories deal with the interaction between "the leader's traits, the leader's behaviours, and the situation in which the leader exist ... (and) the effects of one variable on leadership are contingent on other variables" (Horner, 1997, p. 271). Furthermore, Horner argues that this was a more realistic idea of leadership as it allowed the possibility that leadership could be the result of the situation. More specific theories will now be elaborated, starting with Fiedler's contingency theory, before moving on to Path-Goal theory and leadership substitutes theory.

2.4.3.1 Fiedler's contingency theory

Yammarino et al. (2005) argue that Fiedler's contingency theory was probably the oldest multiple-level approach to leadership, and it was one of the first theories examined by means of multi-source data. In brief, this theory deals with how situational factors, including position power, task structure and leader-member relations, moderate the relationship between leadership effectiveness and a leader trait measure called the Least Preferred Co-worker (LPC) scale (Horner, 1997; Yukl, 2006). This theory was thereby based on a leader's attribute (task-oriented style or relationship-oriented style), and a leader's situational favourableness, and these were used to predict leader's effectiveness. These studies determined that task-oriented leaders were more effective than relationship-oriented leaders in high- and low-control situations; whilst relationship-oriented leaders were more effective than task-oriented leaders in moderate-control situations (House and Aditya, 1997; Yammarino et al., 2005). It was discovered that leaders with high scores on the LPC scale were more effective in some situations whilst leaders with low scores were more effective in other situations (Yukl, 1989). However, the theory suffered from criticisms. Criticisms include: (1) simplicity in only focusing on a single leader trait; (2) ambiguity about what had been measured by LPC scale; (3) neglect of medium LPC leaders; (4) absence of explanatory processes; and, (5) findings were empirically inconsistent (House and Aditya, 1997; Yukl, 1989).

2.4.3.2 Path-Goal theory

By formally connecting leadership with motivation theory, Fry (2003) argues that path-goal theory was one of the more advanced contingency theories of leadership. Proposed by House (1971), path-goal theory deals with the motivation of followers, by arguing that leaders should take responsibility for "helping followers develop behaviours that will enable them to reach their goals or desired outcomes" (Horner,

1997, p. 271). In other words, leaders have to encourage followers to believe that desired outcomes can be obtained through serious effort (Yukl, 1989). Leaders can motivate followers by clarifying their path to available rewards or by increasing their rewards. To do so, leaders have to be directive, supportive, participative or achievement-oriented, meaning that they need to motivate followers by “directing, guiding, and coaching them along the way” (Fry, 2003, p. 700). Path-goal theory thereby explains how leadership behaviours affect the satisfaction, motivation and performance of subordinates (Yammarino et al., 2005; Yukl, 2006). Although path-goal theory has been seen as more advanced than other contingency theories of leadership, Yukl (1989) argues that it still has limitations. Firstly, it relies on questionnaire data from the same respondents; and secondly, it ignores the leader’s influence on task, resource levels and skill levels as explanatory processes for the effects of leadership. Yukl (2006) provides an updated critique, including the suggestion that the biggest weakness of path-goal theory is that it uses expectancy theory, which is an overly complicated and apparently unrealistic description of human behaviour, to explain leader influence. Yukl also suggests other weaknesses, including: (1) relying on broad categories of leadership behaviour; and (2) considering each type of leadership behaviour separately. Despite the limitations, the theory has made important contributions to the study of leadership, including a role in the development of charismatic leadership theory (House and Aditya, 1997; Yammarino et al., 2005). This theory will be explored later in the chapter.

2.4.3.3 Leadership substitutes theory

Leadership substitutes theory is another important contingency leadership theory (Tirmizi, 2002; Yukl, 2006). Developed by Kerr and Jermier in 1978, the theory proposed that aspects of the situation could neutralise or substitute for leadership,

meaning that leaders would no longer be vital to the performance and satisfaction of subordinates (Fry, 2003). This theory is different from early theories suggesting that leadership will be effective in any circumstances (Yammarino et al., 2005). Situational factors that play the role of neutralising relationship-oriented or task-oriented leadership include various characteristics of the individual, the task and the organisation (Yukl, 1989). In Kerr and Jermier's work, a range of characteristics (comprising independent subordinates, professional orientation, indifference towards rewards, cohesive work groups, no control over organisational rewards and spatial distance between leader and follower) tend to neutralise both relationship-oriented and task-oriented leadership. Relationship-oriented leadership would also tend to be neutralised by intrinsically satisfying tasks. Task-oriented leadership would also tend to be neutralised by ability and experience, highly standardised and routine tasks, highly specified staff functions and organisational formalisation (Yammarino et al., 2005). The theory has weaknesses. For instance, it does not provide a detailed rationale for each neutraliser. Also, it relies on broad categories of leadership behaviour that are difficult to connect closely with situational conditions (Yukl, 1989). Even so, it makes a contribution by providing the different perspective that formal leadership influence could be replaced by work design, reward systems, informal peer leadership and self-management (Yukl, 2006).

Having introduced the important contingency theories of leadership, the next section will now turn to the fourth phase of leadership research – new leadership theories.

2.4.4 New leadership theories

Emerging in the mid-1970s, this new paradigm consisted of several leadership theories. According to House and Aditya (1997), the new leadership theories have

characteristics in common. Firstly, the theories attempt to explore how leaders can encourage organisations to achieve outstanding accomplishments; secondly, the theories attempt to explore how certain leaders are capable of reaching high levels of “follower motivation, admiration, respect, trust, commitment, dedication, loyalty, and performance”; thirdly, the theories emphasise leadership behaviours that are symbolic, emotionally appealing and cognitively oriented; fourthly, the theories use common criteria, including “follower self-esteem, motive arousal and emotions, ... identification with the leader’s vision, values, and the collective ... (and) follower satisfaction and performance” to evaluate the influence of a leader (p. 440).

Of the new leadership theories, it can be argued that the most influential were charismatic leadership theory and transformational leadership theory (House and Aditya, 1997). The theories of charismatic and transformational leadership are generally called new leadership theories because they build upon foundations based upon previous theories, particularly path-goal theory (Boal and Hooijberg, 2001; Yammarino et al., 2005). Like path-goal theory, charismatic and transformational theories of leadership involve motivating followers (Fry, 2003; Horner, 1997). The difference is that charismatic and transformational leaders concentrate on how to motivate followers to “exert exceptional effort and make personal sacrifices to accomplish the group objective or mission” (Tirmizi, 2002, p. 270).

Although the terms *charismatic* and *transformational* have always been used interchangeably, differences are apparent (Yukl, 2006). Primarily based on House’s work in 1977, charismatic leadership theory provides new insights into the definition of (un)successful leaders (Tirmizi, 2002). According to Boal and Hooijberg (2001), this theory emphasises followers’ identification with the leader. They argue that to

become a charismatic leader, he or she must have two kinds of charisma: visionary and crisis responsive. The visionary perspective implies that the leader has to create an intrinsically valid world for the follower, in which “behaviors are linked to important core values, purposes, and meanings”. The leader who is crisis responsive has to create an extrinsically valid world for the follower, in which “outcomes are linked to behaviors” (p. 525). Charismatic leaders are more likely to, for instance, articulate appealing visions, communicate high expectations for followers, show confidence, become role models, display creative thinking and behaviours, take additional risks and be more sensitive to people’s needs, external opportunities and potential threats (Yammarino et al., 2005). Effects of the above behaviours may include: (1) increased trust in the leader; (2) leaders and followers become more similar; (3) increased identification with the leader; (4) followers accept the leader unquestionably; and (5) followers become more emotionally involved in the leader’s goals (Fry, 2003).

Accordingly, as Fry (2003) indicates, followers led by the charismatic leader will see work as “an expression of themselves and thus rewarding it and of itself” (p. 701). This suggests that charismatic leadership emphasises intrinsic, rather than extrinsic motivation. Despite its important contribution, charismatic leadership theory has been criticised. First, followers may have unrealistic perceptions of the charismatic leader, and may regard the leader as a super hero or spiritual figure (Yukl, 1989). Second, such leaders may tend to be more aggressive because of their self-confidence. As a result, serious problems may arise. Third, if leaders have too much optimism and confidence, this may stop them from seeing potential problems (Yukl, 2006). To sum up, charismatic leadership theory focuses on “an individual leader rather than on a leadership process” (Yukl, 1989, p. 270) and emphasises

personal identification with the leader (Boal and Hooijberg, 2001).

Building on the earlier ideas of Burns, Bass (1985) proposes a theory of transformational leadership. In Bass's opinion, charisma is a necessary but not sufficient condition for transformational leadership (Boal and Hooijberg, 2001; Yammarino et al., 2005). This implies that the notion of transformational leadership is broader than that of charismatic leadership. From Yukl's (1989) point of view, charismatic leaders influence followers only through "arousing strong emotions and identification". Weak and dependent followers may be necessary so that charismatic leaders can instil "personal loyalty" (p. 272). However, transformational leaders influence followers not only through charisma but also by means of inspirational motivation, intellectual stimulation and individualised consideration (Yammarino et al., 2005). Such leaders tend to empower and promote followers (Yukl, 1989).

In addition to transformational leadership, Bass (1985) also includes transactional leadership in his theory. Different from transformational leadership, which encourages followers to transcend their self-interests for goal accomplishment, transactional leadership uses position power for task completion (Horner, 1997; Yammarino et al., 2005). Focusing on an exchange of rewards for compliance, transactional leadership is considered as an extrinsic-based motivation process that is used to keep the organisation running stably and smoothly (Fry, 2003). Although both kinds of leadership are distinct, they are not mutually exclusive since to attain organisational effectiveness in different situations, leaders have to be both transformational and transactional (Bass, 1985; Fry, 2003; Yukl, 1989).

Despite their positive features, new leadership theories have some conceptual

weaknesses. For instance, transactional leadership is defined negatively, meaning that task-oriented behaviours that are important to the organisational effectiveness are not fully explained. Also, the theories seem to argue that there are universal leadership attributes that are appropriate for all situations, implying that situational variables are not taken into account in the theories (Yukl, 2006). Moreover, there is little evidence to support the propositions that individuals, groups or even organisations have really been transformed by charismatic or transformational leaders (House and Aditya, 1997).

Having introduced the literatures of knowledge management and leadership, attention will now turn to the research question presented here and to the choice of the particular theories that form the basis for the propositions that are presented in the next chapter.

2.5 KNOWLEDGE MANAGEMENT AND LEADERSHIP

The relationship between knowledge management and leadership has been addressed, but not yet in a full and systematic fashion. Typical of pronouncements in the relevant literature is that made by Hansen et al. (1999), who somewhat simplistically suggest that “only strong leadership can provide the direction a company needs to choose, implement, and overcome resistance to a new knowledge management strategy” (p. 116). This statement, and the wider article from which it is drawn, fails to suggest why, and more importantly how leadership supports a company that is implementing a knowledge management strategy. Some scholars have moved one step further, but they are still far from being systematic in terms of identifying the role of leadership in knowledge management. For instance, Nonaka et al. (2000b) suggest leadership as one amongst many factors that determine the rate of knowledge

conversion. As a consequence of their approach, they discuss leadership alongside numerous other complex factors, including knowledge vision, organisational form or structure, incentive systems, corporate culture and organisational routines. Leadership is considered to be central, and is more fully developed than in the case of the work by Hansen et al. (1999), but there is little to suggest awareness of the substantial literature on leadership. Even more recently in Nonaka's work, leadership has been positioned as a central factor in knowledge management but there has been little to tie intuitive ideas to formal studies of leadership. And so it is suggested that leaders must: (1) create knowledge visions; (2) build, energise and manage *bas*; (3) maintain creative routines; and (4) construct effective incentive systems (Nonaka and Toyama, 2002, 2005; Nonaka et al., 2000a; Nonaka et al., 2006). Each of these leadership roles is both underdeveloped and not related to formal studies of leadership.

It has been suggested that leaders must embrace and foster the dynamism of knowledge creation (Nonaka and Konno, 1998). Nonaka and Konno argue that leaders must support knowledge creation with their visionary proposals and personal commitment of time because the success of knowledge creation relies on "responsibility, justification, financial backing, and caring" (p. 53). As such, it can be argued that the role of leadership is to enable, rather than to control and direct knowledge creation (Nonaka et al., 2006). This is similar to the argument by Nonaka and Toyama (2005). They suggest that leadership in the knowledge-creating company should be based more on "flexible distributed leadership, rather than leadership as a fixed control mechanism", and, for such a distributed form of leadership to work, the conception of a middle-up-down leadership approach is required (p. 431). This approach emphasises the close cooperative relationships

between top, middle and lower managers (Nonaka, 1994). Under these circumstances, middle managers are central to leadership for knowledge management. Middle managers have to “bridge top-management visions with chaotic reality at the front line ... and play the roles of instructor, coach, mentor, and coordinator” (Peltokorpi et al., 2007, p. 57). For Nonaka (1994), middle managers are true “knowledge engineers” (p. 32). This leadership approach to knowledge management thus avoids a top-down directive approach that might be associated, say, with transactional leadership, but little is done to explicate the role of leaders in terms of the leadership literature.

In drawing explicitly from the formal leadership literature, choices need to be made both in terms of the leadership literature upon which to focus and the aspect of knowledge management to be investigated. Both areas have been shown in this chapter to be broad. The inquiry presented here takes Nonaka and Takeuchi (1995) as its major framework as regards knowledge management. There are several reasons for adopting Nonaka and Takeuchi (1995). Firstly, as discussed in the previous paragraph, they have established an intuitive foundation for the relationship between knowledge management and leadership which can provide a basis for further investigation. Not only have they established the importance of leadership in knowledge management, but they have also indicated certain leadership characteristics that may be essential to the effectiveness of knowledge management. Secondly, their theory of knowledge creation is derived from the study of successful companies and so has practical relevance. Thirdly, Nonaka and Takeuchi’s book *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, published in 1995, has become highly respected (Easterby-Smith and Lyles, 2005).

As regards leadership, the theoretical framework that will be adopted for this research is Bass's (1985) theory of transformational and transactional leadership. The first reason for taking this new leadership theory into consideration is that, despite criticisms, this is the leadership theory that can be generalised across cultures (House and Aditya, 1997). This framework may thus prove to be relevant to the study of leadership in Taiwan. Secondly, compared with other leadership theories, this new leadership theory pays more attention to developmental issues such as how to empower people (Popper and Mayseless, 2003); and can thus be argued to be conducive to the creation of organisational knowledge. Thirdly, more and more scholars are showing interests in the impact of transformational and transactional leadership on knowledge management. For instance, Bryant (2003) proposes that transformational leadership has effect on knowledge creating and knowledge sharing and transactional leadership is conducive to knowledge exploiting. Politis (2001, 2002) uses transformational and transactional leadership to investigate the relationship between leadership style and knowledge acquisition. The increasing interest in transformational and transactional leadership in the knowledge management literature justifies its appropriateness for this study.

2.6 SUMMARY

The literatures of knowledge management and leadership are reviewed in this chapter. Attention is firstly paid to outlining the concept of knowledge and its various types: tacit knowledge and explicit knowledge; and knowing-how and knowing-what. Next, the chapter turns to introducing three approaches to knowledge management: technology-oriented approaches, relationship-oriented approaches and the approach based upon Nonaka and his colleagues. As regards the leadership literature, four main phases of leadership research are presented: trait approach, behaviour approach,

contingency theories and new leadership theories. Finally, the chapter explains why Nonaka and his colleagues' theory of knowledge creation and Bass's (1985) idea of transformational and transactional leadership are adopted for this study. The next chapter develops the propositions by means of a further literature review.

3

LITERATURE REVIEW II

3.1 INTRODUCTION

The previous chapter provided a general literature review of knowledge management and leadership. This chapter elaborates on knowledge conversion processes and transformational and transactional leadership. The purpose of this chapter is to develop propositions. The structure of this chapter is as follows. The chapter firstly introduces Nonaka and Takeuchi's (1995) idea of knowledge conversion process. After that, attention is turned to outlining the role of leadership and the theory of transformational-transactional (TF-TA) leadership. Finally, the interaction between knowledge conversion processes and the theory of TF-TA leadership is discussed and propositions are presented.

3.2 KNOWLEDGE CONVERSION PROCESS

Nonaka and Takeuchi's (1995) four knowledge conversion processes are premised on Polanyi's (1966) subdivision of knowledge into the categories of tacit and explicit. Tacit knowledge refers to knowledge that is highly personal and context-specific, difficult to formalise and communicate, and embedded in individual's minds, values and emotions, whilst explicit knowledge is organised and can be presented in a systematic form that can be easily sorted, coded and categorised (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka et al., 2000). Nonaka and Takeuchi (1995) propose that knowledge can be created by the dynamic and continuous interaction

between those two kinds of knowledge, leading to four different kinds of knowledge conversion. Socialisation describes the conversion of tacit knowledge into an alternative form of tacit knowledge through observation, imitation and practice. A critical aspect of this conversion process is shared experience. Externalisation is concerned with the conversion of tacit knowledge into explicit knowledge through dialogue or collective reflection which can build upon the use of metaphors, analogies, concepts and models. Combination addresses the conversion of explicit knowledge into an alternative form of explicit knowledge by means of sorting, editing, combining or categorising. This process is facilitated by technology (Nonaka and Takeuchi, 1995; Nonaka et al., 2000). Finally, in the Internalisation process, explicit knowledge is converted into tacit knowledge and storytelling can support this process. As Externalisation and Internalisation processes share a concern for the role of language, the main body of the chapter will present a single section that discusses leadership, language, Externalisation and Internalisation.

The four processes of knowledge conversion interact dynamically and continuously, “starting at the individual level and expanding as it moves through communities of interaction that transcend sectional, departmental, divisional and even organisational boundaries” (Nonaka et al., 2000, p. 12). In consequence, a shared space of interaction called “*ba*” results (Nonaka and Konno, 1998). The term *ba*, originally proposed by the Japanese philosopher Kitaro Nishida, is a kind of space which can be physical (for instance, an office or building), virtual (for instance, electronic formats such as videoconferencing or electronic mail) or mental. Nonaka and Konno (1998) and Nonaka et al. (2000) propose four types of *ba* corresponding with the four modes of knowledge conversion. They are first, originating *ba* relating to the Socialisation process where feelings, experiences and emotions are shared between

individuals; second, interacting *ba* relating to the Externalisation process where through dialogue, mental models and capabilities are converted into concepts; third, cyber *ba* relating to the Combination process where through information technology, explicit knowledge is sorted, coded, categorised and shared throughout the organisation; and finally, exercising *ba* relating to the Internalisation process where explicit knowledge is converted into tacit knowledge (Cohen, 1998; Nonaka and Konno, 1998).

Ba provides a means to consider in greater detail the general point of context. The importance of a proper context for knowledge creation has increasingly been emphasised in recent years mainly because knowledge needs to be enabled or activated, instead of being managed (Cohen, 1998; Eppler and Sukowski, 2000; Nonaka et al., 2000; Powell and Swart, 2005; Von Krogh, Ichijo and Nonaka, 2000). Von Krogh et al. (2000) suggest that an enabling context is essential for effective knowledge creation, whilst Nonaka et al. (2000) argue more directly that “knowledge needs a context to be created” (p. 13). In this regard, context relates particularly to attributes such as trust, psychological safety and care (Ayas and Zeniuk, 2001; Edmondson, 1999; Schein, 1993; Styhre, Roth and Intelgård 2002; Von Krogh et al., 2000). Von Krogh (1998) makes a general point that good relations are necessary if organisational members are to have the “confidence and freedom to satisfy their needs and aspirations to explore unknown territories” (p. 136). Davenport and Prusak (2000) argue that one of the elements which restricts the willingness to transfer knowledge is a lack of trust, so that, for instance, face-to-face meetings, where relationships based upon trust can be established, can be crucial to knowledge transfer. Von Krogh (1998) shows that in contexts exemplified by high-care relationships, organisation members will seek to share their knowledge; whilst they

will be reluctant to do so where care is low. Aside from the issues of trust and care, psychological safety is also important in the knowledge conversion processes (Schein, 1993). Each of these points implicates leadership in particular ways.

3.3 TF-TA LEADERSHIP

Leaders “create environments, reinforce norms, and help set expectations through what they do, through their actions and not just their words” (Pfeffer and Sutton, 1999, p. 104). In broad terms, therefore, leaders set context, and leadership is manifest at two levels that allow us to draw a distinction between strategic leadership, which refers to people at the top within hierarchical definitions of the organization and leadership, which refers to leaders at any level, including the top, and draws attention to the dyadic relationships between leaders and followers (Vera and Crossan, 2004). Strategic leadership is concerned with providing vision and maintaining a context within which knowledge will be developed and shared. At the leadership level, leaders enact the roles of mentors, teachers, coaches, educators and developers. Both of these levels are relevant to knowledge management. For instance, Nonaka et al. (2000) suggest that strategic leaders have to “provide the knowledge vision, develop and promote sharing of knowledge assets, create and energise *ba*, and enable and promote the continuous spiral of knowledge creation” (p. 23). Likewise, Pan and Scarbrough (1998) argue that strategic leaders need to foster corporate cultures and managerial mindsets which are knowledge-oriented, whilst leaders may play the role of facilitators in creating cultures which are conducive to learning (Alvesson and Svenigsson, 2003; Ellinger and Bostrom, 1999, 2002; Eppler and Sukowski, 2000). Edmondson (1999) suggests that leaders’ supportive and coaching-oriented attitudes are likely to contribute towards a safe environment which is conducive to the aims of knowledge management. Combining both elements, Senge (1990b) claims that

strategic leaders play multiple roles as designers, teachers and stewards who are capable of building shared vision, surfacing and testing mental models, and encouraging systems thinking.

The general leadership roles discussed in the knowledge management literature can be conveniently analysed by adopting the transformational-transactional (TF-TA) leadership typology. Building a context in which followers are empowered and are encouraged to be inquisitive, for instance, promotes learning (Ayas and Zeniuk, 2001). This process appears to centre on the promotion of intellectual stimulation amongst followers, which is one of the features associated with transformational leadership. Alternatively, trust, care and psychological safety are aspects of the context required for knowledge management that draw upon transformational leaders' concern to offer individualised consideration.

Derived from Maslow's hierarchy of needs, James MacGregor Burns and Bernard M. Bass are argued to be respectively the originator and the developer of the concept of transformational leadership. This concept is based upon the achievement of a higher collective mission without recourse to the narrowly defined self-interests of followers (Avolio and Bass, 1988; Bass, 1985; Burns, 1978; Hater and Bass, 1988). A core rationale for transformational leadership is the encouragement that is offered to followers to perform above and beyond expectations for reasons other than contingent reward (Dvir, Eden, Avolio and Shamir, 2002; Jung and Avolio, 1999; Yammarino, Spangler and Dubinsky, 1998). There are four characteristics of transformational leadership. The first is idealized influence or charisma, through which a leader is capable of not only providing a vision and a sense of mission, but also instilling pride and gaining respect and trust. The second is inspirational

motivation, through which a leader “communicates high expectations, uses symbols to focus efforts, [and] expresses important purposes in simple ways” (Bass, 1990, p. 22). The third is intellectual stimulation, through which a leader encourages followers to challenge the status quo, helps them to look at problems in new ways, and teaches them to tackle problems personally (Avolio and Bass, 1988; Bass, 1990; Bryman, 1992; Hater and Bass, 1988). The fourth is individualized consideration, through which a leader addresses followers’ needs and respects, trusts and encourages followers. Transformational leadership therefore transcends the contractual nature of work and adopts ways of engaging followers which respect individuals and relationships (Yammarino, Dansereau and Kennedy, 2001).

In contrast, transactional leadership stresses the exchange relationship between leaders and followers through which followers’ actions result from their desire for extrinsic reward (Avolio and Bass, 1988). Transactional leadership comprises three characteristics. These are: contingent reward, based upon leaders rewarding followers for the achievement of agreed objectives; active management by exception, which involves the continuous monitoring of followers, and; passive management by exception, in which leaders only intervene in the work of followers when targets are not met (Howell and Avolio, 1993). Laissez-faire provides a third way of categorising leadership, beyond the transformational and transactional dimensions, and recognises that leadership may be absent in some circumstances (Avolio and Bass, 1988; Bass, 1990; Bryman, 1992; Howell and Avolio, 1993).

3.4 KNOWLEDGE CONVERSION PROCESS AND TF-TA LEADERSHIP

Different situations may require different forms of leadership. It has long been argued, for instance, that leadership in one situation may require different personality

traits to leadership in other situations (Fiedler, 1967; Katz and Kahn, 1978; Stogdill, 1948; Vroom, 1976). More recently, Vera and Crossan (2004) argue that both transformational and transactional leadership are necessary to organizational learning and they show that different forms of learning require different forms of leadership. Although transformational leadership has traditionally been associated with knowledge management, virtually to the exclusion of transactional leadership, the latter may have a role to play in some circumstances (Vera and Crossan, 2004). Husted and Michailova (2002), for instance, suggest that reward systems may be necessary in order to encourage knowledge sharing. Knowledge conversion processes provide a basis for considering the leadership required for knowledge management to that developed by Vera and Crossan (2004). Whilst the discussion which follows does not aim to be complete, it does aim to encourage a more thoughtful approach to the relationship between leadership and knowledge management than has previously been adopted.

3.4.1 Socialisation

Socialisation is a broad, dynamic and continuous process (Nonaka and Takeuchi, 1995). It involves a wide range of activities from, for instance, having meals in a cafeteria, to making observation of colleagues' and supervisors' behaviour (Swap, Leonard, Shields and Abrams, 2001), and comprises formal and informal interactions, including those in which "participants discuss difficult problems while drinking *sake*, sharing meals, and taking a bath together in a hot spring" (Nonaka and Takeuchi, 1995, p. 63). It can be argued that this kind of Socialisation is at the culture level. Socialisation is also at the task level because according to Nonaka and Takeuchi, Socialisation may happen to the interaction between apprentices and their masters. Chao, Walz and Gardner (1992) and Russell and Adams (1997) argue that

Socialisation occurring within groups is the mentoring which is exercised between co-workers. Chao (1997) contends that organisational Socialisation is an outcome of mentoring, whilst McManus and Russell (1997) suggests that mentoring may be a useful tool in the Socialisation of organisational norms and rules. Mentoring supports Socialisation by diminishing social distance and augmenting perceived similarity (Chao et al., 1992; Whitely, Dougherty and Dreher, 1991). It involves senior members enabling junior members to successfully enter a world in which they have an opportunity to develop professional identities and competences (Kram and Isabella, 1985).

Of the different forms of mentoring, psychosocial mentoring, which is synonymous with informal mentoring (Chao et al., 1992), classical mentoring or primary mentoring (Whitely and Coetsier, 1993; Whitely et al., 1991), is informal and occurs spontaneously without the “external involvement” from the organisation (Chao et al., 1992, p. 620; Russell and Adams, 1997, p. 4). It may not necessarily be directly related to task-based relationships between the mentor and the protégé, and it emphasises the development of the protégé’s identity, confidence and competence through role modelling, acceptance, confirmation, counselling and friendship (Chao, 1997; Chao et al., 1992; Kram, 1983). In psychosocial mentoring, the mentor benefits not from formal reward systems but from the respect of superiors and peers, which is earned from being seen to be developing internal talent, and from the personal satisfaction which comes from supporting a protégé (Kram, 1983). Protégés show by their actions that they are worthy of the attention of a mentor; and mentors choose protégés with whom they can identify (Chao et al., 1992).

Psychosocial mentoring is thus a form of organisational citizenship (McManus and

Russell, 1997; Podsakoff and MacKenzie, 1997). Organizational citizenship is considered to be discretionary, is not normally a contractual requirement, and is based upon personal choice (Organ, 1997; Organ and Ryan, 1995; Podsakoff, MacKenzie, Paine and Bachrach, 2000). Psychosocial mentoring does not therefore appear to implicate transactional leadership. Organizational citizenship has been associated with a range of factors, including individual characteristics, job satisfaction, perceptions of fairness and organisational commitment (e.g. Organ, 1994; Organ and Lingl, 1995; Organ and Ryan, 1995; Schappe, 1998), but transformational leadership is central to the support of this behaviour (Farth, Podsakoff and Organ, 1990; Graham, 1988; Organ and Ryan, 1995). Transformational leaders can have indirect impact on organisational citizenship behaviours at the strategic leadership level, for instance, by influencing employee trust and satisfaction (Keller, 1992; Podsakoff, MacKenzie, Moorman and Fetter, 1990). Podsakoff, MacKenzie and Bommer (1996) and Podsakoff et al. (2000) show that transformational leadership has significant and consistent effects on the organisational citizenship behaviours of altruism, courtesy, conscientiousness, sportsmanship and civic virtue, whilst Organ and Ryan (1995) show that leadership consideration is strongly related to altruism. It is thus suggested that transformational leadership will be appropriate to the process of Socialisation.

Proposition 1: The Socialisation process depends upon transformational leadership.

3.4.2 Externalisation and Internalisation

Nonaka and Takeuchi (1995) argue that metaphors and analogy are necessary to the conversion of tacit knowledge into explicit knowledge. Metaphors connect the relatively unknown with the familiar (Tsoukas, 1991), and this can be achieved

through the ability of metaphors to convey novel and sometimes unexpected distinctions in a clear manner (Beyer, 1992). Akin and Palmer (2000) suggest that metaphors are an integral part of language through which people engage in sensemaking (Weick, 1995). In summary, metaphors are of vital importance in knowledge management as “a carrier of cultural elements ... provid[ing] access to more complex understanding and to describe ways of making sense ... [and to] facilitate communication and the conversion of tacit knowledge into explicit knowledge” (Gherardi, 2000, p. 1062).

Metaphors are a staple element within storytelling and share with storytelling a concern for the role of language. Stories convey contextual detail which embodies tacit knowledge because listeners “visualize and live the story in the mind’s eye, and so experience the story as if they are living inside it ... [and consequently] get a feel for multiple aspects of the situation, immerse themselves in it, and get a fresh sense of perspective” (Denning, 2001, p. 70). Stories are important to strategic leadership because they help participants to develop a common outlook (Brown and Duguid, 2000) and convey “the organizational experience of members or clients ... developing, sharpening and renewing the sense of purpose held by organizational members ... [and] co-creating vision and strategy” (Boyce, 1996, p. 19). Nonaka and Takeuchi (1995) associate storytelling with the conversion of knowledge from explicit to tacit and storytelling can thus support the process of Internalisation in an organisation (Swap et al., 2001).

Language is clearly central to both storytelling and metaphors and has been widely discussed in relation to the construction of reality (e.g. Bourgeois and Pinder, 1983; Donnellon, Gray and Bougon, 1986; Morgan, 1980, 1983). In this respect,

knowledge is the result of the interaction between perception, language and memory (Bourgeois and Pinder, 1983), and, more directly, language is knowledge (Astley and Zammuto, 1992). Phenomena and events which are socially constructed are argued to result from linguistic conventions rather than from empirical observation, since language influences the ability to perceive and to establish facts (Astley and Zammuto, 1992; Edwards, 1997; Potter, 1996). In this regard, metaphors are implicated in the construction of reality (Gherardi, 2000; Morgan, 1980). Thompson (1987) additionally argues that language works not only at the level of a sign to describe the world but also as a fundamental medium for people to act and interact in the world. In purely practical terms, language supports the development of consensus in a group (Donnellon et al., 1986).

The relationship between language and leaders has long been established. Pondy (1978), for instance, states that “leaders’ subtle use of language may also be an important factor in determining his effectiveness, both in enhancing his credibility and in managing the influence process” (p. 94). Astley and Zammuto (1992) suggest that the ability to use language is central to leadership effectiveness. Leaders need to articulate concepts in creative ways that make them relevant to ongoing organisational realities. Waldman, Javidan and Varella (2004) define the key behaviours of charismatic leaders in terms which include the ability to express vision through powerful imagery. This point is addressed at a fundamental level when language is considered both at its figurative and literal levels. There seems to be acceptance within the management literature that stories and metaphors are more commonly figurative than literal in their consequences (e.g. Akin and Palmer, 2000; McGuire, 2000; Stern, 1988; Tsoukas, 1991). Marshak (1993), for instance, describes a metaphor as “a form of symbolic, rather than literal, expression” (p. 44). Nonaka

and Takeuchi (1995) similarly denote a metaphor as “a way of perceiving or intuitively understanding one thing by imaging another thing symbolically” (p. 66).

So, what kind of leaders will encourage the use of figurative language? One way of approaching this question is to follow the argument that literal language appears to be appropriate to transactional leadership. Tsoukas (1991) argues that literal language is necessary to science, and is most applicable for conveying information about tangible aspects of life. The emphasis within transactional leadership is on precise definitions of situations, to permit monitoring, management-by-exception and reward. The style of transactional leadership therefore does not appear to be one that will encourage the use of figurative language. It is transformational leaders who can be argued to be the ones who inspire through their use of language, and thus who are the storytellers and users of metaphor. Since strategic leaders act as role models, this may encourage others to adopt figurative language as part of their approach to knowledge management. Ready (2002) argues that highly respected role models such as executives are the most appropriate candidates for storytellers and Dennehy (1999) suggests that, “a top executive can spark the listener’s imagination and trigger a snowball of creativity that eventually permeates the culture of an organization” (p. 41). The role of storytelling thus seems to be allied to charisma. Further, the use of metaphors “increase mental agility, allowing managers to redefine problems in ways that are more amenable to resolution” (Astley and Zammuto, 1992, p. 455), and is thus consistent with transformational leadership to the extent that it is concerned with intellectual development rather than extrinsic reward. It is therefore suggested that transformational leaders will be appropriate to the processes of Externalisation and Internalisation.

Proposition 2: The Externalisation and Internalisation processes depend upon transformational leadership.

3.4.3 Combination

Combination is the most concrete and systematic process of the four knowledge conversion processes. A key element is the development of information technology, including on-line networks and databases (Nonaka and Konno, 1998). These systems share the aim of innovating work flows and business processes in order to obtain substantial improvements in quality, service levels, costs or other resources (Chen, 2001; Davenport, 1993, 1998; Kawalek and Wood-Harper, 2002; Lee and Lee, 2000; Martinsons, 1995; Mohanty and Deshmukh, 2001; Nah, Lau and Kuang, 2001), and information systems have been recognised as an effective way of achieving competitive advantage (Davenport, 1998; Hammer and Champy, 2001; Sutcliffe, 1999). Information technology is concerned with information systems in which data are identified, acquired and systemised into database so as to be available for users (King, 2001), or processed through systems such as enterprise resource planning (ERP), which integrate explicit information, such as in finance and accounting, manufacturing, human resources, distribution and supply chain, into a single company-wide database system (Chen, 2001; Davenport, 1998; Lee and Lee, 2000; Umble and Umble, 2002). Other technologies that may be associated with information systems include enterprise system (ES) (Davenport, 1998; Scott and Vessey, 2002) and computer-aided software engineering (CASE) (Sharma and Rai, 2003).

Leadership has been extensively discussed in relation to the successful implementation of information systems (Jiang, Klein and Chen, 2001; Sarker and

Lee, 1999, 2003; Sharma and Rai, 2003; Stone, 1994; Sutcliffe, 1999; Thite, 2000). The emphasis has been towards effective, strong, aggressive and directive leadership (Feeny and Willcocks, 1998; Hammer and Champy, 2001; Sarker and Lee, 2003; Scott and Vessey, 2002; Stone, 1994; Umble and Umble, 2002). Feeny and Willcocks (1998) argue that global competition shortens product life cycles and pressures from customers require business solutions that are delivered quickly and effectively. This suggests that directive leaders are needed to control the timing, flow and steps necessary to complete the necessary projects (Feld and Stoddard, 2004; Sutcliffe, 1999). Given that radical organisational change is envisaged, it is argued that inertia or resistance is likely to arise from followers with a vested interest to “proceed conservatively” or to “dig in their heels” (McAfee, 2003, p. 86). Overcoming these barriers may require the exercise of authority (Martinsons, 1995). Additionally, the need to manage tight deadlines and to meet limited budgets (Nah et al., 2001) implies that feedback, reward systems and performance measurement are inevitable in project development (Chen, 2001; Feld and Stoddard, 2004; Hammer and Champy, 2001; Saker and Lee, 1999). It has been argued that contingent rewards are of particular importance to the systems development process (Ravichandran and Rai, 1999, 2000). Through contingent rewards, it is argued, followers will be able to pursue leader’s expectations and leaders will ensure proper rewards for fulfilling performance targets (Thite, 2000). In summary, the information systems literature argues that transactional leadership is necessary to effective information systems development and implementation because transactional leadership is events-centred, short-term, hard-data oriented and focuses on tactical issues (Covey, 1992).

In addition, since the major purpose of information systems development is to improve organisations’ competitive position in their marketplaces through

redesigning entire business processes rather than individual tasks (McAfee, 2003; Stone, 1994), the activity of developing systems is often both project-based and reliant upon group efficacy, the extent to which a group can perform a particular task effectively (Gibson, 1999; Whitney, 1994). Seijts, Latham and Whyte (2000) argue that quality of guidance is central to group efficacy. More particularly, Chen and Bliese (2002) show that leadership is a critical predictor of group efficacy and Kahai, Sosik and Avolio (2003) suggest that it is imperative for a group leader to display transactional leadership to promote group efficacy. So, in contrast to Socialisation which is associated with the common experiences that result from the influence of work group members upon each other, Combination can be argued to require transactional leadership because in this case the emphasis for the group is upon the knowledge management of specific information systems tasks.

Proposition 3: The Combination process depends upon transactional leadership.

3.5 SUMMARY

This chapter discusses the literatures of knowledge management and leadership and then suggests propositions to be pursued by this research. Attention is firstly directed to outlining the four kinds of knowledge conversion process: Socialisation, Externalisation, Combination and Internalisation and the four corresponding contexts or *bas*: originating *ba*, interacting *ba*, cyber *ba* and exercising *ba*. Next, the chapter turns to introducing the ideas of transformational-transactional (TF-TA) leadership. As regards TF-TA leadership, relevant components and their characteristics are introduced. Laissez-faire is incorporated into analysis involving TF-TA leadership and is considered in the chapter as a third approach to leadership. The chapter finally draws attention to the integration of knowledge conversion processes and TF-TA

leadership. As regards Socialisation process, it is proposed that transformational leadership is required because the process is based upon psychosocial mentoring. As regards Externalisation and Internalisation processes, it is proposed that they both require transformational leadership because transformational leaders seem to be the ones who are users of figurative language and metaphors. As regards Combination process, it is proposed that transactional leadership is required because the process needs transactional leaders to make systems development and implementation more effective. The next chapter outlines the framework of the previous knowledge management research.

4

RESEARCH FRAMEWORK

4.1 INTRODUCTION

This chapter outlines how previous KM studies were framed in terms of research methods. The chapter starts with examining qualitative and quantitative research strategies. Interview and questionnaire methods are considered as illustrations of these methods and also for their relevance to the research conducted here. The nature of triangulation research strategy is then introduced. Afterwards, the chapter describes the kind of research method adopted by previous knowledge management (KM) research.

4.2 OVERVIEW OF DIFFERENT RESEARCH STRATEGIES

This section provides a summary of two main forms of research strategy – qualitative and quantitative. This distinction helps us to categorise different methods of social research and to understand the relevant issues (Bryman, 2001). Qualitative research is considered first.

4.2.1 Qualitative research strategy

Qualitative research is concerned with interpretation, subjectivity, and values (Brewerton and Millward, 2001; Bryman, 2001; Silverman, 2001). It includes using ethnographic approaches to explore, describe, interpret and analyse individuals' behaviour, attitudes, perceptions, feelings and beliefs (Brewerton and Millward, 2001;

Easterby-Smith, Thorpe and Lowe, 2002; Hakim, 1987). Denzin and Lincoln (2000) argue that qualitative research has several characteristics. Firstly, it is not concerned with quantification. Secondly, it relates to reality which is socially constructed. Thirdly, it entails researchers building up a close relationship with their studies. And, finally, it allows situational considerations to play a part in shaping inquiry. Denzin and Lincoln regard qualitative research as being capable of “capturing the individual’s point of view ..., examining the constraints of everyday life ... (and) securing rich descriptions” (p. 10). As Hakim (1987) points out, qualitative research involves providing “richly descriptive reports of individuals’ perceptions, attitudes, beliefs, views, and feelings ...” (p. 26).

Miles and Huberman (1994) argue that qualitative research needs to be conducted “through an intense and/or prolonged contact” as they believe that this is the only way to inquire effectively into the “everyday life of individuals, groups, societies, and organizations”. They assume that qualitative research is conducted by those who are trying to gain a holistic and contextually relevant insight through “a process of deep attentiveness, of empathetic understanding, and of suspending or “bracketing” preconceptions about the topics under discussion” (p. 6). They see qualitative research as an attempt to explore, understand and analyse people’s day-to-day situations.

Bryman (2001) argues that qualitative research is concerned with words rather than with numbers. He proposes several features of qualitative research. First, he believes that the relationship between theory and the study is established inductively, meaning that the former results from a process based upon the latter. Second, he claims that epistemologically those who conduct qualitative research are interpretivists. This is

because such research is associated with inquiry into phenomena that need to be explored descriptively and/or comparatively (Johnson and Harris, 2002). Bryman (2001) also considers qualitative research from an ontological viewpoint. In his opinion, such research implies constructionism as he believes that phenomena, meanings and categories are socially determined. To summarise, Bryman considers that qualitative research helps researchers to see through the eyes of the people being studied, emphasises the context of social behaviour, views social phenomena from the perspective of process, and encourages concepts and theories to emerge from the data.

Qualitative research is capable of providing a deep understanding of social phenomena (Silverman, 2001). It helps researchers to explore not only the areas of inquiry originally defined, but also areas of interest which emerge from the study (Johnson and Harris, 2002). In addition, qualitative research has been seen by some scholars as innovative and creative since its techniques and procedures can be established flexibly (Remenyi, Williams, Money and Swartz, 1998; Silverman, 2001). Hakim (1987) considers the validity of the data as one of the bonuses of qualitative research. She argues that data can truly represent the opinions and experiences of the subjects involved in the research. Additionally, Hakim claims that qualitative research is “extremely valuable for identifying patterns of associations between factors on the ground, as compared with abstract correlations obtained from the analysis of large scale surveys and aggregate data” (p. 28).

Since qualitative research is often conducted with small samples, a common criticism concerns representativeness and problems of generalisability (Bryman, 2001; Hakim, 1987). Bryman (2001) argues that qualitative studies are hard to replicate. The

rationale for this argument is based upon the possibility that the research may rely upon the researchers. There may not be standard procedures and “what is observed and heard and also what the researcher decides to concentrate upon is very much a product of his or her predilections” (p. 282). Also, according to Alvesson and Deetz (2000), qualitative interviews are “relatively loosely structured and open to what the interviewee feels is relevant and important to talk about ...” (p. 71). The accuracy of information provided by respondents is also open to question (Easterby-Smith et al., 2002).

Though sample size in qualitative research is relatively small, data analysis involves “reading, coding, re-coding, re-reading and comparison of the transcript” (Johnson and Harris, 2002, p. 111) and can be time consuming. Easterby-Smith et al. (2002) note that researchers may face difficulties in interpreting experiences which are potentially personal and in “deciding how and when to impose any interpretive frameworks on this” (p. 129). Bryman (2001) argues that because researchers’ opinions have influence on, for instance, what is considered meaningful and important, and because researchers may develop close relationships with the people studied, qualitative research suffers from being too subjective. Lack of transparency is another shortcoming proposed by Bryman. He argues that qualitative researchers sometimes fail to convey the details of the research process and how conclusions are drawn from the study.

4.2.2 Qualitative interview methodology

Interviews can be structured, unstructured and semi-structured and are sometimes known by the alternative typology, standardised, unstandardised and semistandardised interviews (e.g. Phillips, 1971). Each occupies its own position in a

spectrum from structured to unstructured interviews at the two extremes, with semi-structured interviews in the middle. The degree of structure relies upon the kind of information researchers want to draw out (Punch, 1998; Walliman, 2005).

Structured interviewing gives researchers control over the administration of the interview. In this interviewing, everything, including the context of questioning, the schedule, the questions and even the question order is prescribed by the researchers (Brewerton and Millward, 2001; Bryman, 2001). As Phillips (1971) suggests, the interviewer is restricted to “the specific wording in the interview question schedule ... not free to adapt his questions to the specific situation, to change the order of topics, or to ask other questions” (p. 128). Interviewees are commonly asked to select from a fixed range of answers, and will not be allowed to explore or discuss further areas of interest (Brewerton and Millward, 2001; Bryman, 2001). By and large, through minimising flexibility and variation and gaining uniformity, structured interviews generate reasonable responses (Phillips, 1971; Punch, 1998). Brewerton and Millward (2001) point out that structured interviews ensure “rapid data coding and analysis, easy quantification of data and consequent comparability of responses and guaranteed coverage of the area of interest to the research” (p. 70).

At the opposite extreme to structured interviewing, unstructured interviews do not have pre-planned or prescribed questions, but instead rely upon a small number of open-ended questions. Punch (1998) argues that this kind of interview is sometimes called an ethnographic interview. It is able to produce rich and valuable data, because it is “non-standardised, open-ended (and) in-depth” (p. 178). Fontana and Frey (1998) suggest that this kind of interviewing is used in order to “understand the complex behavior of members of society without imposing any a priori categorization that

may limit the field of inquiry” (p. 56). In this regard, interviewers are free to develop any or all of a given number of topics in whatever ways they think most appropriate for the research (Brewerton and Millward, 2001; Phillips, 1971). Bryman (2001) indicates that the style of questioning and the phrasing and ordering of questions can change from case to case. Interviewees are allowed to respond and express themselves as they deem appropriate. One can therefore argue that unstructured interviewing is suitable for those who want to explore a situation and wish to obtain information about original areas of inquiry (Walliman, 2005). The disadvantages of unstructured interviewing centre on the time commitment required by interviewers, who may need specific training to develop relevant interviewing skills (Bernard, 2000; Punch, 1998).

Semi-structured interviewing falls between the two extremes of structured and unstructured interviewing and combines some of the advantages and the disadvantages of each (Phillips, 1971; Walliman, 2005). On the one hand, it is not as regimented as the former and on the other hand, it is not as open-ended as the latter. Although those who conduct this kind of interviewing still have an interview schedule or guide containing a written list of questions and topics, they are allowed to vary the sequence of questions, ask further questions and investigate beyond the answers to these questions (Bryman, 2001; Phillips, 1971). Semi-structured interviewing allows interviewers to explore and probe into certain areas of interest, and lets interviewees have latitude to justify their responses and to provide more detailed information (Brewerton and Millward, 2001). Unlike structured interviewing, semi-structured interviews allow interviewees to express their own opinions on specific questions, and unlike unstructured interviewing, semi-structured interviews need not be as demanding upon interviewees. Bernard (2000) thus argues that

semi-structured interviewing is appropriate for those who need to use their time efficiently, including “managers, bureaucrats, and elite members of a community” (p. 191).

4.2.3 Quantitative research strategy

Quantitative research has long been associated with positivism and originates in the natural sciences. The main feature of quantitative research is that it espouses the value of quantification and so it is sometimes associated with the use of numerical data (Johnson and Harris, 2002). Johnson and Harris argue that quantification may take three forms. The first concerns description and simply uses numbers to describe some phenomena. The second involves comparison and is usually associated with comparing statistical data between two or more groups. The third is about working out “predictive model of cause and effect” (p. 102). Quantitative research which focuses on measuring casual relationships between variables may be necessary to a value-free framework (Denzin and Lincoln, 2000). From Denzin and Lincoln’s point of view, quantitative research implies objectivity because measurement procedures are applied. Quantitative researchers have little or no personal contact with their respondents. This is particularly true when they are using mail questionnaires. Quantitative researchers believe that this lack of involvement with the people they study increases the degree of objectivity.

Bryman (2001) claims that although it is hard for social science to guarantee that “the conditions in a replication are precisely the same as those that pertained in an original study” (p. 76), the ability to replicate remains a central benefit of quantitative research. Replication pertains to the quality of good quantitative research in that it is “replicable by a third party or at another point in time by the same

researcher” (Johnson and Harris, 2002, p. 102; Remenyi et al., 1998). Quantitative research can also be claimed to be generalisable (Bryman, 2001). The importance of this benefit is that cumulative generalisations will be helpful in building universal laws.

Bryman (2001) argues that quantitative research has been facing a great deal of criticism in recent years. First, quantitative researchers are accused of employing principles of natural science to inquire into the social world, ignoring the differences between natural and social phenomena. Second, qualitative researchers are suspicious of quantitative findings obtained by statistical methods because “the connection between the measures developed by social scientists and the concepts they are supposed to be revealing is assumed rather than real” (p. 77). Another criticism associated with quantitative research is that there is always a question of how well respondents’ answers to questionnaires really reflect their daily lives. Qualitative researchers believe that quantitative research is concerned with a “static social world that is separate from the individuals who make it up” (p. 78). Denzin and Lincoln (2000) argue that quantitative researchers cannot inquire into specific experiences of everyday life because they only “seek a nomothetic or etic science based on probabilities derived from the study of large numbers of randomly selected cases” (p. 10). In other words, quantitative research fails to take social and cultural construction into consideration (Silverman, 2001). This is due to the fact that quantitative researchers use numbers to see and describe the world (Johnson and Harris, 2002). As a result of this, they can be criticised because they produce impersonal, third-person accounts with statistical models and tables (Denzin and Lincoln, 2000).

4.2.4 Quantitative survey methodology

The questionnaire is one of the most commonly used quantitative survey methodologies. Questionnaires are popular and can be used in a variety of situations including, for instance, assessing political opinions and consumer preferences (Brewerton and Millward, 2001; Easterby-Smith et al., 2002). Questionnaires can aim to collect “a generalisable public opinion that is available to be tested through the use of (certain) sorts of questions” (Remenyi et al., 1998, p. 150). Brewerton and Millward (2001) argue that questionnaires are attractive to academics as well as practitioners because they are low-cost, require minimal resources and have large sample-capturing capabilities. Walliman (2005) argues that questionnaires are impersonal, that the questions are fixed and consistent as between respondents and have no geographical limitations due to the availability of mediums such as post or electronic mail. The intention of questionnaires is to translate the research objectives into specific questions for the purpose of describing, explaining and/or testing (Frankfort-Nachmias and Nachmias, 1992; Remenyi et al., 1998).

Questions can be open-ended or closed-ended. The former do not pre-specify the response categories and the latter provide a set of options and ask respondents to select the category which represents their views most closely. Questions tend to elicit two different kinds of information. The first is factual or demographic information (Frankfort-Nachmias and Nachmias, 1992; Punch, 1998). This includes background details relating to age, level of education and length of relevant experience (Easterby-Smith et al., 2002). The other kind of information that questionnaires elicit involves subjective responses (Frankfort-Nachmias and Nachmias, 1992). These cover respondents' attitudes, behaviours, values, beliefs and/or opinions (Punch, 1998; Remenyi et al., 1998).

4.2.5 Triangulation research strategy

Qualitative or quantitative research can only be seen as a single-strategy research. This section introduces another kind of research strategy. The essential principle of this kind of approach is to combine different methods. The approach has received attention under different headings, including multi-method strategy (Harrison, 2002), mixing methods (Easterby-Smith et al., 2002), or triangulation.

The concept emerges from the process of positioning a ship or aircraft by comparing its position from more than one known navigational point. So, the principle of triangulation implies exploring the truth from as many angles as possible. In research methodology, involving more than one research method means that it may improve our knowledge of the object of inquiry (Bailey, 1978). This idea had already been explored by Norman Denzin as early as in the 1970s (Denzin, 1970). There are four basic kinds of triangulation. The first involves data triangulation. In this case, data are collected over different time frames or from a variety of sources (Denzin and Lincoln, 2000; Easterby-Smith et al., 2002). The second is called investigator triangulation. This means that multiple rather than single investigators are involved in collecting data concerning the same situation (Denzin, 1970; Easterby-Smith et al., 2002). The third is theoretical triangulation, in which multiple disciplines are used to explain a single set of data (Denzin and Lincoln, 2000). Finally, methodological triangulation is concerned with using qualitative and quantitative methods in a single study or using different types of qualitative or quantitative research.

It seems that the idea of triangulation is becoming more and more popular (Bryman, 2001). By and large, the advantage of triangulation is that it compensates for weaknesses in one method through the strength of another (Hall and Hall, 1996). It is

thus argued that the strengths and weaknesses of various methods will be “cancelled out to produce more convincing findings” (Gill and Johnson, 2002, p. 201). An alternative argument is that if researchers intend to improve the validity and reliability of their studies, multiple rather than single methodological approaches need to be employed because different approaches may provide mutually reinforcing data (Bryman, 1988; Eden and Huxham, 2002; Remenyi et al., 1998). Even though Bryman (2001) suggests that triangulation should not be seen “as an approach that is universally applicable or as a panacea” (p. 456), triangulation may help to minimise the bias of research (Remenyi et al., 1998) and to increase researchers’ confidence in their findings (Bryman, 2001; Harrison, 2002). One cannot deny that it really provides researchers with a better way to see this world.

4.2.6 Further discussion

As a researcher, one thing that needs to be kept in mind is that there is no “good” or “bad” research strategy. There is only “appropriate” or “inappropriate” research strategy. As Silverman (2001) points out, the rationale of choosing a research method should “depend upon what you are trying to find out” (p. 25). In practice, however, it is evident that particular methods may be considered more superior. For instance, as Silverman indicates, qualitative research may be considered to be second-class. This may result from the perception that qualitative research lacks systematic method and is easier to pursue than quantitative research (Clark-Carter, 1997). The situation, however, has been changing. Qualitative research is now becoming more and more fashionable in a wide range of fields of social science (Alvesson and Deetz, 2000; Brewerton and Millward, 2001). To a large extent, the popularity of qualitative research results from the fact that quantitative approaches have increasingly failed to measure and quantify rapid social changes (Denzin and Lincoln, 2000).

Alvesson and Deetz (2000) provide a good example illustrating the above shift. This example refers to leadership research. It is true that as in many other fields, research has long been dominated by positivistic methods underlining the importance of “objectivity, neutrality, scientific procedure, technique, quantification, replicability, generalization, and discovery of law” (p. 49). Nevertheless, more and more researchers recognise that leadership is complex and is unlikely to be standardised and seen as a general, distinct phenomenon. Using quantitative methods will thus result in difficulties because “leaders, subordinates, and measurements of various qualities, feelings and outcomes are social constructions – they are not simple reflections of objective reality” (p. 59). Likewise, Bryman (2004) argues that qualitative researchers have made considerable contributions to the field of leadership, especially in new areas of leadership such as “shared leadership, e-leadership, and environmental leadership” (p. 762). In this regard, qualitative research is becoming more widely accepted as a way of generating meanings and interpretations in the social sciences (Brewerton and Millward, 2001).

There is increasing appreciation of qualitative and quantitative research strategies because they have their own value and they are vital for different purposes (Alvesson and Deetz, 2000; Weber, 2004). As Remenyi et al. (1998) point out, these two approaches can complement each other and are necessary to research if “significant and generalisable additions are to be made to the body of knowledge” (pp. 136-7). The battle between these two research strategies can be seen as a battle between interpretivism and positivism as the former is associated with qualitative research and the latter with quantitative research. Weber (2004) argues that there is no point to such a division and differences may be largely rhetorical. He suggests that attention should now be turned to the purpose of researcher itself rather than to debates about

positivism and interpretivism. Questions should centre on, for instance, what can researchers do in order to get on with the research business they are doing? Or how can researchers improve the knowledge of some phenomena? Once these questions become central, choosing which kind of research and/or data-analysis method to be used may not be such an issue because the focus moves to consideration of the methods which can bring the maximum benefit to research. As Weber points out, we as researchers should be able to understand research methods rather than let them divide us.

4.3 PREVIOUS RESEARCH STRATEGIES IN THE KM DOMAIN

Before examining what, and more importantly, why certain research strategies and methodologies will be used in this study, it is necessary to look at the research strategies and methodologies adopted in previous knowledge management research.

4.3.1 Previous research using qualitative methodologies

For researchers and practitioners, the most popular reason for using qualitative methodologies is the belief that the real world is constructed by meanings and interpretations and cannot be measured or explained in quantitative terms. In other words, they believe that this social world is subjective and multiple and research has to be grounded inductively rather than deductively (Brewerton and Millward, 2001). As qualitative researchers are concerned more about people's lives and stories, organisational behaviour and social movements (Bouma and Atkinson, 1987), methodologies being used tend to be ethnographic and include participant observation, depth interviewing and discourse analysis. Qualitative research has been widely accepted by researchers in the knowledge management field for these reasons.

Interviewing, observation, archival data and other approaches have been helpful to researchers in their investigations. For instance, by conducting interviews, Sackmann (1992) studies the extent to which four different kinds of knowledge are shared by the members and Ellinger and Bostrom (2002) examine managers' beliefs about their roles as learning enablers. Besides conducting interviews, Alvesson and Sveningsson (2003) additionally use observations to discern managers' leadership styles in a knowledge-intensive organisation. To inquire into the performance of the knowledge-sharing network between Toyota and its suppliers, Dyer and Nobeoka (2000) conduct interviews as well as archival data analysis. Miner, Bassoff and Moorman (2001) use interview, observation and archival data analysis to investigate the relationship between organisational improvisation and learning. Table 4.1 summarises qualitative studies published in leading journals and shows the wide range of data that have been gathered including, but not restricted to interviews, observation and archival material.

Existing qualitative research methods have limitations when they are applied to this study. Observation is difficult in terms of gaining access to specific instances where leadership is clearly and unambiguously involved in the process of, for instance, converting tacit knowledge into tacit knowledge. Organisations are complex entities in which different kinds of knowledge are converted anywhere and anytime. Hence, if observation is going to be used in this study, observers may need to spend a great deal of time before encountering the leadership of specific knowledge conversion processes.

Archival data analysis is concerned with using minutes of meetings, logs, announcements, formal policy statements, letters, statistical records, electronic mail

Table 4.1 Major Research Using Qualitative Methods

Research Topics	Research Methods/Instruments	Researchers
The influence of subculture existence and formation on the share of different types of knowledge in organisations	<ul style="list-style-type: none">● Interviews● Observations● Written Documents	Sackmann (1992)
The interaction between stocks and flows of organisational knowledge and firm performance	<ul style="list-style-type: none">● Archival Data	Decarolis and Deeds (1999)
The role of prior organisational acquisition experience in the performance of acquisitions from the perspective of behavioural learning	<ul style="list-style-type: none">● Archival Data	Haleblian and Finkelstein (1999)
From a resource-based perspective, the roles of integrating practices and superior performance in causing shared knowledge among firm members and product development capability	<ul style="list-style-type: none">● Observations	Hoopes and Postrel (1999)
The knowledge-sharing network between Toyota and its first-tier suppliers	<ul style="list-style-type: none">● Interviews● Archival and Survey Data	Dyer and Nobeoka (2000)

Table 4.1 Major Research Using Qualitative Methods (continued)

Research Topics	Research Methods/Instruments	Researchers
The nature of tacit knowledge	● Casual Mapping	Ambrosini and Bowman (2001)
	● Self-Q Interviews	
	● Semi-structured Interviews	
	● Metaphors	
The relationship between organisational improvisation and learning	● Observations	Miner et al. (2001)
	● Transcripts	
	● Semi-structured Interviews	
	● Archival Data	
The roles of environmental complexity and dynamics, learning needs and learning norms in an organisation's learning capabilities	Case Study by:	Wijnhoven (2001)
	● Structured Interviews	
	● Document Research	
	● Observations	
The way in which managers perceive themselves as facilitators of learning in learning-oriented organisations	● Semi-structured Interviews	Ellinger and Bostrom (2002)
	● The Critical Incident Technique	

Table 4.1 Major Research Using Qualitative Methods (continued)

Research Topics	Research Methods/Instruments	Researchers
The influence of human action on organisational knowing in practice	Field Study by: <ul style="list-style-type: none">● Interviews● Observations● Document Research	Orlikowski (2002)
How managers place their work and themselves in terms of leadership in a knowledge-intensive firm	<ul style="list-style-type: none">● Observations● Interviews	Alvesson and Sveningsson (2003)
The relationship between technological knowledge sharing and higher innovative performance	<ul style="list-style-type: none">● Archival Data (from the scientific papers and firms' patents)	Spencer (2003)

or even music or pictures as tools to do the investigation (Marshall and Rossman, 1995). This method is problematic due to the availability of texts and/or documents related to knowledge conversion process and leadership style. One may argue that employees' training records can be viewed as useful documents regarding learning activities, but such activity probably refers to only one kind of knowledge conversion process and may not address leadership.

According to Punch (1998), strategy, purpose and research questions should be the three factors determining the selection of interviewing method. As this study is about exploring the likely interaction between knowledge conversion processes and leadership styles, structured interviewing is another method which is not going to be used in this study. This is because we may not be able to find the material necessary to investigate the relationship between knowledge conversion processes and leadership style. In other words, as the study of knowledge conversion processes and leadership is still new, a wholly structured set of questions elaborating the relationship between knowledge conversion processes and leadership is unlikely to come out at this stage. It can be argued from the literature review that it is not yet time to develop appropriate instruments because researchers have not yet pursued this area sufficiently.

Unstructured interviewing is also not adopted in this study. Although knowledge management has already become a popular term in industry, it does not necessarily mean that practitioners have fully thought through the links between knowledge management and leadership. Therefore, the risk of using open-ended interviewing is that there is a chance of ending up with chunks of rich but difficult to analyse data. In other words, unstructured interviewing may elicit important views but may fail to

build adequately upon the literature survey and thus make it difficult to comment upon the propositions.

Semi-structured interviewing seems to be an appropriate method for this study. This argument is based upon the literature review. It has been revealed that there should be relationships between knowledge conversion processes and leadership style. As these two phenomena can be clearly identified and yet their relationship must be explored at the level of practice, semi-structured interviewing is appropriate because as mentioned earlier, it allows researchers to explore specific areas of interest in such a way that the interview is able to direct the area of questioning whilst allowing the interviewee to develop areas of interest. Semi-structured interviewing is able to ensure not only that data is collected which is relevant to the propositions, but also that the researcher can be open to ideas that practitioners may present which will amplify or modify theoretical concepts. This is particularly important in the area of knowledge management, where there has been little or no empirical testing of the validity of the Nonaka and Takeuchi's (1995) theoretical framework.

One problem is raised and this concerns how to make sure that before conducting a semi-structured interview every interviewee has the same level of understanding about knowledge conversion processes. To solve this problem, the nature of knowledge conversion processes will be explained to the interviewees. However, this may give rise to potential drawbacks. First, interviewees may have different levels of conceptual understanding, thus leading to a lack of standardisation. Second, there is a risk of interviewees not paying full attention to the explanation due to the abstract concepts involved. The interviewer may need to explain some points again and again. Third, it is difficult to know how much information is actually absorbed by

interviewees. So, written material (scenario/description) illustrating the characteristic of knowledge conversion will be provided. With this material, the interviewees will be more likely to have an equal, standardised opportunity to focus on the specific knowledge conversion process to be discussed. Details of the written materials are provided in the next chapter.

4.3.2 Previous research using quantitative methodologies

In the knowledge management field, questionnaires have been widely used. For instance, Szulanski (1996, 2000) investigates the process of best practice transfer in terms of internal stickiness; Tsai (2001) employs a network perspective to examine how network position and absorptive capacity occupied by organisational units have an impact on the generation of innovation and performance; Simonin (1999) looks at the effects of tacitness, asset specificity, prior experience and complexity as antecedents of knowledge ambiguity for technological knowledge transfer between strategic alliance partners. Alternatives to questionnaire-based approaches include Okhuysen and Eisenhardt's (2002) experimental study into whether formal interventions, including information sharing, questioning others and managing time, have an influence on individuals' knowledge integration in groups. A table of quantitative research studies into knowledge management is presented in Table 4.2. Again, this table provides indicative studies which have been published in leading journals.

4.3.3 Previous research using the idea of triangulation

The idea of triangulation is evident in knowledge management research. For instance, by conducting a qualitative-quantitative combined study, Edmondson (1999) examines the relationship between psychological safety and teams' learning

Table 4.2 Major Research Using Quantitative Methods

Research Topics	Research Methods/Instruments	Researchers
Absorptive capacity as a function of the firm's innovation and learning capabilities	● Questionnaires	Cohen and Levinthal (1990)
The relationship between the speed of transferring and imitating organisational capabilities and underlying knowledge	● Questionnaires	Zander and Kogut (1995)
The process of knowledge transfer in a firm in terms of internal stickiness	● Questionnaires	Szulanski (1996, 2000)
The role of collaborative know-how in obtaining greater benefits	● Questionnaires	Simonin (1997)
The effects of knowledge ambiguity and its antecedents on knowledge transfer in strategic alliances	● Questionnaires	Simonin (1999)
The relationship between absorptive capacity, learning and performance in international joint ventures	● Surveys	Lane, Salk and Lyles (2001)
The influence of institutional, social and political factors on the assimilation of knowledge platforms in organisations	● Questionnaires	Purvis, Sambamurthy and Zmud (2001)

Table 4.2 Major Research Using Quantitative Methods (continued)

Research Topics	Research Methods/Instruments	Researchers
The influence of organisational units' central network positions on more innovation and better performance in terms of units' absorptive capacity and ability to duplicate new knowledge	● Questionnaires	Tsai (2001)
The roles of the nature, performance and timing of a firm's acquisition experience in helping the firm to select the right acquisition from the perspective of organisational learning	● Database	Hayward (2002)
The effects of the formal interventions on knowledge integration in groups	● Experimental Setting	Okhuysen and Eisenhardt (2002)
The roles of interunit competition and coordination in knowledge sharing behaviours within the company	● Questionnaires	Tsai (2002)
Overseeing effort and management involvement as antecedents for firms to acquire knowledge from international joint ventures	● Questionnaires	Tsang (2002)
The impact of entry mode and organisational learning on the R&D intensity of foreign affiliates	● Surveys	Belderbos (2003)

behaviour. Likewise, Sabherwal and Becerra-Fernandez (2003) adopt both interviews and questionnaires to investigate the effect of knowledge management processes at the levels of individual, group and organisation. Fedor, Ghosh, Caldwell, Maurer and Singhal (2003) employ two instruments to verify the relationship between leadership and support (inputs), knowledge generation and dissemination (processes) and team members' ratings of project success (outputs). A table of studies using triangulation is presented as Table 4.3. As in the case of the last two tables (4.1 and 4.2), this table shows indicative studies that are published in leading journals.

4.4 SUMMARY

This chapter discusses various kinds of research strategies and their advantages and disadvantages. Research strategies that have been used in previous knowledge management research are then introduced. The next chapter provides details of the research strategy adopted for this study and on the way in which the research was conducted.

Table 4.3 Major Research Using both Qualitative and Quantitative Methods

Research Topics	Research Methods/Instruments		Researchers
The effects of psychological safety on learning in organisational work team	● Observations		Edmondson (1999)
	● Interviews		
	● Surveys		
The importance of weak ties to knowledge sharing across subunits in a multiunit organisation	● Interviews		Hansen (1999)
	● Archival Data		
	● Surveys		
Attraction as a factor by partner similarity to affect knowledge transfer	● Quantitative Modeling		Darr and Kurtzberg (2000)
	● Structured Interviews		
The influence of process- or content-oriented context on the four knowledge management processes	● Interviews		Becerra-Fernandez and Sabherwal (2001)
	● Questionnaires		
The role of specialisation in knowledge production for the boundaries of the firm	● Semi-structured Interviews		Brusoni, Prencipe and Pavitt (2001)
	● Patent Database		
The impact of organisational learning in subunits on knowledge outflows to other subunits	● Interviews		Schulz (2001)
	● Surveys		

Table 4.3 Major Research Using both Qualitative and Quantitative Methods (continued)

Research Topics	Research Methods/Instruments		Researchers
The roles of the transfer and deployment of tacit overseas knowledge in MNCs’ capabilities to develop transnational new products	●	Interviews	Subramaniam and Venkatraman (2001)
	●	Surveys	
The effects of knowledge’s observability and system embeddedness on organisational structure	●	Interviews	Birkinshaw, Nobel and Ridderstråle (2002)
	●	Questionnaires	
The roles of short knowledge network paths in obtaining more existing knowledge and faster project completion	●	Interviews	Hansen (2002)
	●	Surveys	
The importance of firms’ public and private knowledge to innovative outcomes	●	Semi-structured Interviews	Matusik (2002)
	●	Surveys	
The roles of knowledge base and organisational form in the work commitment, effort and job satisfaction of knowledge workers	●	Semi-structured Interviews	May, Korczynski and Frenkel (2002)
	●	Observations	
	●	Document Research	
	●	Surveys	
The influence of the complexity, tacitness and specificity of a firm’s knowledge on the persistence of knowledge-based advantage	●	Interviews	McEvily and Chakravathy (2002)
	●	Surveys	

Table 4.3 Major Research Using both Qualitative and Quantitative Methods (continued)

Research Topics	Research Methods/Instruments		Researchers
The relationship between complexity, strategic group knowledge and firm performance	●	Questionnaires	McNamara, Luce and Tompson (2002)
	●	Archival Data	
The role of knowledge partitioning in providing implications for the knowledge-based theory of the firm	●	Interviews	Takeishi (2002)
	●	Questionnaires	
The role of team leaders in promoting learning in interdisciplinary action teams	●	Interviews	Edmondson (2003)
	●	Archival Data	
	●	Statistical Analysis	
The relationship between team-level leadership support, knowledge management activities and team members' project performance	●	Semi-structured Interviews	Fedor et al. (2003)
	●	Surveys	
The influence of four knowledge management processes on knowledge management effectiveness at individual, group and organisational levels	●	Interviews	Sabherwal and Becerra-Fernandez (2003)
	●	Questionnaires	

5

RESEARCH DESIGN

5.1 INTRODUCTION

This chapter explains the specific research design of this study. The strategy of this research is triangulation. The two major instruments involved throughout the research are scenarios and a questionnaire. The research design incorporated three phases. The first two were pilot studies, and the last comprised the main study. The chapter begins by presenting the strategy and then outlining the instruments before moving on to describe the pilot and main studies.

5.2 RESEARCH STRATEGY

Triangulation is adopted as an overarching research strategy for this study because it seems that no single methodological approach would be sufficient to capture and elicit the whole picture of knowledge management and leadership. An important reason is that little research has shown interest in exploring the potential relationship between knowledge conversion processes and leadership. Under these circumstances, using various perspectives to examine the propositions developed through the literature review should help to support the validity and reliability of this study. The methods adopted are based in part on scenario/description, semi-structured interviews and a questionnaire.

The use of the questionnaire is intended to either complement the semi-structured

interviews, by providing mutually reinforcing data, or cancel out weaknesses of interviewing, where, for instance, interviewees do not recall important aspects of leadership during the interview but do so when prompted by the questionnaire. Additionally, as this study contains three different phases (two pilot studies and one main study), and each has its own sample group, it means that this is also a data triangulation study because the data will come from different time frames and a variety of sources (Denzin, 1970; Easterby-Smith et al., 2002).

5.3 RESEARCH INSTRUMENTS

The research instruments are scenarios/descriptions and questionnaires. The former is designed to elicit responses regarding knowledge conversion processes throughout both the semi-structured interviews and the questionnaires and the latter addresses leadership in relation to the scenario/description. Given that these two kinds of instruments have never been exploited jointly in the knowledge management field, this research design is both unique and exploratory. In the following sections, the way in which these instruments were used will be further elaborated.

5.3.1 Scenarios

This study can be regarded as a scenario study as it involves using a scenario-based interview and survey. Remenyi et al. (1998) explain that a scenario describes “a particular hypothetical situation occurring” (p. 58). Scenarios have been used in prior research. For instance, Trevino and Victor (1992) use scenarios to represent two different contexts, academic cheating and fast-food restaurant theft, to explore whether peer reporting of unethical behaviour will occur. Scenarios are used by Gómez, Kirkman and Shapiro (2000) to describe a work situation where employees have been dedicated to a special project in order to investigate collectivism and

evaluation generosity. The main purpose for using scenarios is to elicit the subject's comments about the situation described or to provide the basis for questionnaire responses. For instance, Fedor, Davis, Maslyn and Mathieson (2001) use scenarios as a stimulus to encourage the recall of subject's past behaviours. As Greenberg and Eskew (1993) point out, scenarios can be good at helping researchers to inquire into the ways in which individuals respond to particular events. Subjects are requested to role-play a particular event or a situation that is familiar with them.

In this study, the book of *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* by Nonaka and Takeuchi (1995) will be used as the main basis for the scenarios. An important reason is that it is the first ever book that introduces the whole spectrum of knowledge management and its relevant ingredients, including knowledge conversion processes. The author of this book constitutes another reason. Ikujiro Nonaka has been recognised as the founding father of this knowledge management domain. Given that, nothing seems to be better than this book to become the source of the scenario.

As this study is concerned with different knowledge conversion processes, drawing subjects' attention to those processes is important. Clarification of the nature of the processes is also important because interviewees may not be aware of Nonaka and Takeuchi's (1995) SECI framework. The research design starts by building up several scenarios or descriptions representing the knowledge conversion processes. The development of a new instrument is necessary because prior empirical work has either considered knowledge management as a totality or used existing instruments that look at aspects of knowledge management that exclude concern for knowledge conversion processes. Through the scenario/description, it is intended to focus the mindset of the

subjects and clarify the knowledge conversion processes which are the object of the research study. So, the point of the development of the scenarios/descriptions is to encourage interviewees to talk about leadership in the context of specific knowledge conversion processes. Additionally, the scenarios/descriptions provide a focus which allows the response to the questionnaire to concentrate upon the knowledge conversion processes.

There are two kinds of knowledge, tacit and explicit, leading to four different kinds of knowledge conversion processes: tacit to tacit (Socialisation process), tacit to explicit (Externalisation process), explicit to explicit (Combination process) and explicit to tacit (Internalisation process) (Nonaka and Takeuchi, 1995). Inasmuch as there are four kinds of knowledge conversion processes, four different scenarios are developed accordingly. Instances or examples presented in Nonaka and Takeuchi (1995) are the sources of the scenarios. There are two reasons for adopting this approach. The first is that prior research provides no basis for the research beyond such material in Nonaka and Takeuchi. The second allows the research to assess the validity of the examples provided in Nonaka and Takeuchi's book. The approach is thus grounded in the major source of conceptual framing in the field but is also open to the possible development or critical review of that conceptual framing. The scenario details are provided in Appendix A.

5.3.2 Multifactor Leadership Questionnaire (MLQ)

The second instrument used in this research is a questionnaire. In contrast to the use of scenarios to focus interviewees' attention, this questionnaire instrument is designed to elicit perceptions of leadership. In the leadership literature, various questionnaires have been developed. They address, for instance, motivated leadership versus task

motivated leadership, supportive leadership versus directive leadership or participative leadership versus achievement-oriented leadership. In this study, however, the questionnaire which is associated with transformational leadership and transactional leadership will be adopted. This questionnaire is called the Multifactor Leadership Questionnaire (MLQ) and it is designed by Bernard Bass and Bruce Avolio. The MLQ has been widely recognised and used (Bass, 1999; Den Hartog et al., 1997), and it has been amended several times and has developed into various forms. For instance, MLQ 2 and 6 are short forms and MLQ 11 is for military purpose. Besides a wide range of forms, the MLQ has also been translated into major languages including French, Spanish, German, Italian, Dutch, Hebrew, Arabic, Chinese and Japanese (Bass, 1995), and it has been used globally in around two hundred research programmes, dissertations and theses.

The latest version of the Multifactor Leadership Questionnaire (MLQ Form 5x-Short) was purchased from the company called Mind Garden for use in this study. There are five scales designed to measure transformational leadership. They are Idealized Influence (Attributed) (sample item: "I instill pride in others for being associated with me."), Idealized Influence (Behavior) (sample item: "I specify the importance of having a strong sense of purpose."), Inspirational Motivation (sample item: "I talk enthusiastically about what needs to be accomplished."), Intellectual Stimulation (sample item: "I seek differing perspectives when solving problems.") and Individual Consideration (sample item: "I spend time teaching and coaching."). There are four items in each transformational scale.

With regard to transactional leadership, there are three scales: Contingent Reward (sample item: "I express satisfaction when others meet expectations.");

Management-by-Exception (Active) (sample item: “I concentrate my full attention on dealing with mistakes, complaints, and failures.”); Management-by-Exception (Passive) (sample item: “I wait for things to go wrong before taking action.”). A final scale addresses Laissez-faire Leadership (sample item: “I delay responding to urgent questions.”). Again, each scale contains four items. In addition to those transformational, transactional and laissez-faire scales, there are three other scales which evaluate the outcomes of leadership: Extra Effort (sample item: “I get others to do more than they expected to do.”); Satisfaction (sample item: “I use methods of leadership that are satisfying.”); and Effectiveness (sample item: “I am effective in representing others to higher authority.”). Each behaviour item is measured by a five-point frequency scale covering from *not at all (0)* to *frequently, if not always (4)* (Howell and Avolio, 1993).

Politis (2001, 2002) uses the Multifactor Leadership Questionnaire (MLQ) to examine the relationship between leadership style and a particular framing of knowledge management. Politis pays attention to the role played by leadership in the process of knowledge acquisition. There is substantial research which has validated the use of the MLQ (e.g. Den Hartog, Van Muijen and Koopman, 1997; Hater and Bass, 1988; Howell and Avolio, 1993). Inasmuch as the propositions adopt the model of transformational-transactional (TF-TA) leadership, the use of the MLQ is necessary to this testing. This research will use the MLQ to examine respondents’ attitudes towards leadership for specific scenarios which have been developed from Nonaka and Takeuchi’s (1995) writings.

5.4 PHASE I – PILOT STUDY

Conducting pilot studies is a first step in examining the research question and there

are several reasons for researchers to adopt pilot studies. These include securing initial data, assessing whether the study is feasible and realistic, checking acceptability of research instruments, and/or identifying potential problems which might take place whilst using the proposed data analysis methods (van Teijlingen and Hundley, 2001). The major motivation for adopting a pilot study for this research is to understand the reaction of practitioners to the research design. So, a pilot study is conducted to explore: the pervasiveness of the knowledge management concept; the relationship between knowledge conversion processes and leadership style; and the response of participants and the adequacy of the proposed instruments and techniques. There were twenty full-time managers involved in this first pilot study. They came from both manufacturing and service sectors in Taiwan. The industries in which they were involved included IT, banking, trading and retailing, and the titles included functional managers, team leaders, supervisors, regional managers and general managers. As activities of knowledge conversion take place everywhere in an organisation, the potential population is those who have had leadership experiences at all management levels. This criterion was applied not only to this pilot study but also to the following pilot and main studies. For the managers recruited in this pilot study, there was an approximately equal balance in terms of gender (55% were male and 45% were female), and they were predominately above middle-age (90% were above the age of thirty-one) and 70% had over eight years of experience. Table 5.1 summarises the gender, age and experience of the interviewees.

As mentioned earlier that the potential population for this research is Taiwanese leaders who have had leadership experiences at all management levels of an organisation, it may be impossible to list the population as a basis for probability sampling. So, non-probability sampling was adopted. According to

Frankfort-Nachmias and Nachmias (1992) and Remenyi et al. (1998), non-probability sampling is suitable for exploratory research. This kind of sampling has several forms and the one that was used in this research was convenience sampling. Brewerton and Millward (2001) and Remenyi et al. (1998) argue that in convenience sampling, friends and relatives are recruited because they are available to participate in the study. Besides convenience sampling, this research also used snowball sampling because some managers were introduced by the others. Although this sampling is “the loosest possible definition of a sampling approach” (Brewerton and Millward, 2001, p. 118), Remenyi et al. (1998) argue that sometimes it is the only way for a researcher to obtain access to appropriate participants.

Table 5.1 *Descriptions of the Samples of the first Pilot Study*

<i>Factors</i>		<i>Quantity</i>	<i>Percentage</i>
GENDER	Male	11	55%
	Female	9	45%
AGE	21 ~ 30 Years Old	2	10%
	31 ~ 40 Years Old	7	35%
	41 ~ 50 Years Old	5	25%
	Above 50 Years Old	6	30%
EXPERIENCE	Less than 3 Years	0	0%
	3 ~ 5 Years	2	10%
	6 ~ 8 Years	4	20%
	Above 8 Years	14	70%

Following Nonaka and Takeuchi (1995), the knowledge conversion processes that are to be examined in this pilot study are Socialisation, Externalisation, Combination and Internalisation. Accordingly, there are four scenarios and these are shown as Appendix A. All written materials including the MLQ were translated into the local language and the final instruments are shown as Appendix B. These scenarios are close

adaptations of examples provided by Nonaka and Takeuchi (1995). Managers were randomly divided into four groups so that each group comprised five managers. The total number of twenty interviews was completed within about two weeks, and each interview lasted for approximately thirty minutes. All of the interviews were recorded and transcribed.

The interviews were conducted as follows. Firstly, a welcome speech was made, and then the respondent was told that the survey addressed knowledge conversion processes and their relationship with leadership. Secondly, the respondent was given “Section A” of the materials and was asked to tick the appropriate boxes referring to their personal information such as gender, age and years of working experience. Thirdly, the respondent was asked to read carefully the contents of “Section A”, including the scenario, the brief descriptions of tacit and explicit knowledge and the four possible knowledge conversion processes. Fourthly, the respondent was asked to respond to the semi-structured questions. These included “In your opinion, which knowledge conversion process does this scenario illustrate? Why?”; “Can you please give me an example from your own experience of a situation that illustrates the tacit-tacit (or tacit-explicit, or explicit-explicit, or explicit-tacit) conversion process?”; “In your experience, what kind of leadership leads to excellent knowledge conversion for the tacit-tacit (or tacit-explicit, or explicit-explicit, or explicit-tacit) conversion process? Can you give me any examples?”; “What kind of leadership leads to poor knowledge conversion for the tacit-tacit (or tacit-explicit, or explicit-explicit, or explicit-tacit) conversion process? Can you give me any examples?” Fifthly, the respondent was given “Section B” of the materials and was asked to read the instructions and then to fill in the MLQ (5x-Short). Finally, the respondent was thanked for participation in the study.

5.4.1 Qualitative findings

The first point relates to validity. Questions were asked in order to assess respondent's ability to relate the scenarios to the knowledge conversion processes. The respondents performed in a disappointing way because most were unable to indicate correctly the knowledge conversion process the scenario was intended to represent. The overall matching rate was only 25%: meaning that 0% for the Socialisation group (no one got it right), 20% for the Externalisation group (one person got it right), 40% for the Combination group (two persons got it right) and 40% for the Internalisation group (two persons get it right). In the case of illustrating the particular knowledge conversion process by means of an example, 35% of the respondents (seven respondents) were unable to do so. Their responses to this enquiry were, for instance, *"I cannot think of any"*, *"I do not have any ideas"* or *"I really need some time to think about it"*. The majority asked for more time to prepare a response. For those who provided an example, responses appeared to be appropriate but diverse. For instance, one of the respondents suggested that Socialisation can take place through discussion or communication between people. Another suggested that Socialisation only happens to those who have just graduated from universities and have become organisational newcomers. This meaning implies a wider process than that associated with knowledge conversion process at a task level.

In addition to the issue of validity, the pilot study provided differences of opinion in terms of the underlying proposition that leadership is contingent upon knowledge conversion processes. For some respondents, leadership is contingent whilst for others it is a universal practice. Some of the respondents gave the opinion that supportive leadership can lead to excellent performance whatever the knowledge conversion process. For instance, one of the respondents from the Socialisation group stated that

“supporting the conversion of tacit knowledge to tacit knowledge ... should be the supportive one”. A manager from the Externalisation group argued that *“if you want to convert from tacit to explicit, my personal opinion is that open management will be more appropriate”*. A similar situation occurred within the Internalisation group. One of the respondents suggested that to support this conversion, leaders must use *“more inspiring, humane and non-authoritarian ways ... they must be humane, inspiring and encouraging”*.

Notwithstanding some managers believe that being supportive is of particular importance, others think that it should not be taken for granted. For them, leadership must be dependent upon specific factors and these factors are not restricted to knowledge conversion processes. For instance, a manager from the Externalisation group suggested that *“for those who are between the ages of thirty and forty, they probably need you to push them ... For those who are between twenty and thirty, (you) usually cannot do that ... you have to ... lead them gently, have a cup of coffee or something”*. One of the respondents from the Combination group argued that different kinds of leadership have different consequences. She stated that *“if you are authoritative, you perhaps can have an immediate effect on this Combination process ... But in the long run, certainly, it is alternative kinds of leadership style that make explicit to explicit knowledge last longer”*. A manager from the Internalisation group claimed that leadership style should depend upon the level of competency of the follower. She argued that *“if you deal with a person and he/she is a “clean sheet” or “empty vessel”, you probably have to adopt more authoritative ways because ... he/she needs to develop professional know-how ... probably authoritative ways can make him/her grow faster. But, when he/she has a certain level of competence, probably use humane ways, you can gain more from him/her”*.

As a whole, managers in this pilot study seem to believe that leadership is an important element in knowledge conversion processes. However, the problem is that it is not easy to identify any difference between the four groups in terms of their attitudes towards leadership. It is certainly not easy from this study to find any support for the propositions. This set of interviewees appears to consider that contingent or supportive leadership can apply to any kind of the knowledge conversion process. The difficulty of supporting the propositions was also evident from the quantitative findings.

5.4.2 Quantitative findings

Since this study is concerned with the study of differences between groups rather than with the correlation between variables, it aims to investigate the difference between the variances between knowledge conversion groups and the variances within knowledge conversion groups. It can be argued that the former variance results from systematic variation and the latter represents random variation (Turner and Thayer, 2001). A statistical approach that deals with this type of situation is called the (univariate) Analysis of Variance (usually abbreviated to ANOVA), and the critical statistic is the *F*-test or *F*-ratio (Clark-Carter, 1997). As only one source of impact (knowledge conversion process) is involved, this study can be regarded as a one-factor ANOVA design.

Tables 5.2 and 5.3 indicate the results for the MLQ of the first pilot study. There are no significant differences between the groups either for leadership as a whole ($F = 0.755$, $df = 3, 12$, $p > 0.05$), or for transformational leadership ($F = 0.768$, $df = 3, 14$, $p > 0.05$) or for transactional leadership ($F = 1.831$, $df = 3, 13$, $p > 0.05$). At the level of the individual factors, there is only the transformational scale of *Idealized Influence*

Table 5.2 Results of Means and Standard Deviation of the first Pilot Study

Overall			Socialisation			Externalisation			Combination			Internalisation			
n	M ¹	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD	
LEADERSHIP	16	2.5246	0.2632	5	2.5275	0.2730	2	2.7594	5.745E-02	4	2.4078	0.1696	5	2.5213	0.3487
TF Leadership	18	2.9028	0.3136	5	2.9800	0.1525	3	2.6500	0.4822	5	2.9500	0.3260	5	2.9300	0.3365
IIA ²	20	2.7750	0.5494	5	3.0500	0.2092	5	2.0500	0.4472	5	3.0500	0.1118	5	2.9500	0.5420
IIB ³	19	2.7368	0.6094	5	2.9000	0.4183	4	2.3125	0.3146	5	2.7000	0.6225	5	2.9500	0.8732
IM ⁴	20	3.0625	0.5785	5	3.0000	0.5000	5	2.8500	0.7202	5	3.3000	0.6937	5	3.1000	0.4541
IS ⁵	20	2.8625	0.4551	5	2.9500	0.3708	5	2.8000	0.6708	5	2.8500	0.5477	5	2.8500	0.2850
IC ⁶	19	2.8289	0.4934	5	3.0000	0.5303	4	2.6250	0.5951	5	2.8500	0.4183	5	2.8000	0.5420
TA Leadership	17	2.0809	0.4180	5	2.0750	0.4601	3	2.4583	0.2818	4	1.7656	0.2246	5	2.1125	0.4494
CR ⁷	19	2.8026	0.5564	5	2.9000	0.6021	4	2.5625	0.5543	5	2.9500	0.6937	5	2.7500	0.4677
MEA ⁸	19	2.2237	0.8815	5	2.7000	0.6937	4	2.1250	1.0897	5	2.2000	1.0062	5	1.8500	0.8023
MEP ⁹	18	1.3750	0.9558	5	1.1000	1.1538	4	1.6875	1.1434	4	0.8125	0.6884	5	1.8500	0.6519
LF ¹⁰	19	1.5921	0.7130	5	1.6000	0.4183	4	1.7500	1.0000	5	1.0500	0.7984	5	2.0000	0.3536

¹ Mean scores of 0 is “Not at all”, 1 is “Once in a while”, 2 is “Sometimes”, 3 is “Fairly often” and 4 is “Frequently, if not always”.

² Idealized Influence (Attributed)

³ Idealized Influence (Behavior)

⁴ Inspirational Motivation

⁵ Intellectual Stimulation

⁶ Individualized Consideration

⁷ Contingent Reward

⁸ Management-by-Exception (Active)

⁹ Management-by-Exception (Passive)

¹⁰ Laissez-faire

Table 5.3 Results of One-Way ANOVA of the first Pilot Study

		Sum of Square	df	Mean Square	<i>F</i>	Sig.
LEADERSHIP	Between Group	.165	3	.055	.755	.541
	Within Group	.874	12	.073		
	Total	1.039	15			
TF Leadership	Between Group	.236	3	.079	.768	.531
	Within Group	1.436	14	.103		
	Total	1.672	17			
IIA	Between Group	3.538	3	1.179	8.576	.001
	Within Group	2.200	16	.138		
	Total	5.738	19			
IIB	Between Group	1.087	3	.362	.971	.432
	Within Group	5.597	15	.373		
	Total	6.684	18			
IM	Between Group	.534	3	.178	.489	.695
	Within Group	5.825	16	.364		
	Total	6.359	19			
IS	Between Group	.059	3	.020	.082	.969
	Within Group	3.875	16	.242		
	Total	3.934	19			
IC	Between Group	.319	3	.106	.393	.760
	Within Group	4.063	15	.271		
	Total	4.382	18			
TA Leadership	Between Group	.830	3	.277	1.831	.191
	Within Group	1.965	13	.151		
	Total	2.795	16			
CR	Between Group	.400	3	.133	.387	.764
	Within Group	5.172	15	.345		
	Total	5.572	18			
MEA	Between Group	1.874	3	.625	.774	.527
	Within Group	12.113	15	.808		
	Total	13.987	18			
MEP	Between Group	3.163	3	1.054	1.193	.348
	Within Group	12.369	14	.883		
	Total	15.532	17			
LF	Between Group	2.401	3	.800	1.779	.194
	Within Group	6.750	15	.450		
	Total	9.151	18			

(*Attributed*) revealing significant differences between the groups ($F = 8.576$, $df = 3$, 16 , $p < 0.05$). In this case, the Externalisation group responded in a different way to the other groups as it provided a lower score.

5.4.3 Discussion

According to Nonaka and Konno (1998), the four knowledge conversion processes (Socialisation, Externalisation, Combination and Internalisation) function in four different *bas* (originating *ba*, dialoguing *ba*, systemising *ba* and exercising *ba*) or contexts. As a result, four different knowledge assets (experiential knowledge assets, conceptual knowledge assets, systemic knowledge assets and routine knowledge assets) are generated. It is therefore appropriate to argue that since leadership influences contexts and is concerned with assets, it should also be distinctive in relation to each kind of the knowledge conversion process. This argument is specifically supported by Nonaka and Konno who indicate that different leadership styles are required in different *bas*.

The inability to find differences between the groups at either the qualitative or quantitative levels of analysis may thus suggest the need to redesign the study. The scenarios play a key role in determining how the managers respond qualitatively as well as quantitatively and there appears to be an issue of validity arising from their use. Managers seem to receive different messages from the scenario even if they were in the same group, and only five out of the twenty managers (25%) related the scenario to the knowledge conversion process appropriately. In addition, for those managers who claimed that they understood what the scenario illustrated, their interpretations were not valid. It is possible that the scenarios extracted from Nonaka and Takeuchi (1995) seem to be unable to convey valid examples which interviewees

can relate to the underlying conceptual framework.

Another difficulty faced by the managers in this study may be the use of academic jargon. As the language adopted by Nonaka and Takeuchi (1995) is widely used in academic circles, terms such as “tacit knowledge”, “explicit knowledge” and “explicit knowledge converting to tacit knowledge” were taken for granted in this study. However, some managers suggested that the study was too academic to understand. Additionally, some suggested that it is difficult to capture the essence of different kinds of knowledge and of knowledge conversion process. This is possibly due to the fact that most of the participants have just recently become aware of knowledge management and do not fully understand the elements involved. Under these circumstances, it seems impossible to expect them to absorb the concepts described and then to provide relevant examples within a short space of time.

There appears to be a need for further improvement in the research design. On the one hand, the managers seemed to have little understanding of knowledge management from an academic point of view, and on the other hand, the scenarios failed to provide sufficiently clear examples to illustrate knowledge conversion processes. The appropriate response to the first issue seems to be providing explanations which are as clear as possible. With regard to the latter issue, however, subsequent endeavours should be focused on developing an instrument which is more understandable and hopefully will not cause any serious confusion to participants. As a consequence, scenarios were not used in the second pilot study.

5.5 PHASE II – FURTHER PILOT STUDY

Some features of the first pilot study were retained in this study. The Multifactor

Leadership Questionnaire (MLQ) was again used because it can bring the benefit of triangulation. For instance, in the first pilot study, the results of the MLQ confirmed the reading of the interview transcripts and reinforced the finding that different leadership styles were not associated with different knowledge conversion processes. Also, the MLQ has been used in numerous prior studies and is an established way of determining respondents' views regarding leadership. More importantly, the MLQ remains as a prompt to draw out aspects of leadership which may not be evident from the semi-structured interviews but may yet be significant in explaining appropriate leadership for specific knowledge conversion processes. The way of recruiting potential candidates also remained unchanged. Convenience sampling and snowball sampling were retained due to the exploratory nature of the study. The main criterion was again the need for interviewees to have experience of leading people in an organisation.

Several new elements were brought to this phase. Firstly, a new group of participants was recruited. The second change concerned the scope of the study. In this phase, only two kinds of the knowledge conversion processes (Socialisation and Combination) were considered. The reason for this focus was to investigate whether leadership styles might be different for the two extreme forms of knowledge conversion processes. Propositions that relate the topic of leadership to all four knowledge conversion processes (Socialisation, Externalisation, Combination and Internalisation) were empirically tested in the first pilot study. However, the findings suggested that there was no difference between the four knowledge conversion processes in terms of leadership styles. It can be argued that the result of the first pilot study may not be surprising since the leadership literature has suggested that transformational and transactional leadership is a universal framework with

relevance across many different contexts. In order to provide the best opportunity to find differences, two clear but opposing knowledge conversion processes were taken into consideration.

The reason for choosing Socialisation and Combination was reinforced by similarities in the underlying processes required for Externalisation and Internalisation. For instance, both Externalisation and Internalisation processes emphasise the importance of the role of language. They both involve tacit and explicit knowledge. In contrast, Socialisation is centred upon tacit knowledge, and its conversion into other kinds of tacit knowledge, whilst Combination is concerned with explicit knowledge. Under these circumstances, it was therefore assumed that if differences were to be found, it would be most likely in studies considering the processes of Socialisation and Combination. The final change involves the use of scenarios. These were not employed because from the experience of the first pilot study, scenarios increased the chance of producing confused and ambiguous data. As an alternative, plain wording was used to describe Socialisation and Combination processes.

The total number of managers recruited for this pilot study was twelve. Although this is less in total than that of the previous study, the restriction of the scope of the study resulted in a sample for each knowledge conversion process comprising six managers, which is slightly larger than the number for each knowledge conversion process in the previous study. As in the first pilot study, the backgrounds of the participants were various. The managers came from industries including IT, insurance, transportation and hospital. To avoid travelling costs, the selected managers were Taiwanese and yet were based in the UK. They were postgraduate or research

students in universities who nevertheless had been working for several years in Taiwan and had extensive leadership experience. 42% of the participants were male and 58% were female. The majority (90%) were above the age of thirty-one, and all participants were between the ages of twenty-one and forty. More than half of them (67%) had over six years of experience. The general information of the participants is summarised in Table 5.4.

Table 5.4 *Descriptions of the Samples of the second Pilot Study*

<i>Factors</i>		<i>Quantity</i>	<i>Percentage</i>
GENDER	Male	5	42%
	Female	7	58%
AGE	21 ~ 30 Years Old	6	50%
	31 ~ 40 Years Old	6	50%
	41 ~ 50 Years Old	0	0%
	Above 50 Years Old	0	0%
EXPERIENCE	Less than 3 Years	0	0%
	3 ~ 5 Years	4	33%
	6 ~ 8 Years	6	50%
	Above 8 Years	2	17%

The descriptive statements which were used to explain the concepts of Socialisation and Combination were extracted from Nonaka and Takeuchi (1995). The survey instruments are shown as Appendix C. As in the case of the first pilot study, all written materials including the questionnaire were translated into Taiwanese and are presented as Appendix D. Each interview lasted approximately forty to fifty minutes and all of the interviews were recorded and transcribed.

The interviews were conducted in a similar fashion to the first pilot study. First of all, the respondent was told that the survey relates to knowledge conversion processes

and leadership. The respondent was then asked to fill in the “Personal Information” in Section A, including information on gender, age and years of working experience. Afterwards, the respondent was requested to read the “Description” provided in Section B. After the respondent finished reading the “Description”, the semi-structured interview schedule was followed. The questions were: “In your opinion, what kind of leadership leads to excellence of this particular “Description” in Section B?”; “Can you give me any relevant examples from your experience?” and “Do you think that the leadership you have just discussed is unique to this situation?”. The respondent was finally asked to read the instructions and then to fill in the questionnaire (MLQ, 5x-Short) in Section C. Finally, respondents were thanked for their participation.

5.5.1 Qualitative findings

The first point is significant to the design of the main study and it is that despite being encouraged to reveal their opinions about the role of leadership in a particular knowledge conversion process, experienced managers appear to be prone to talk about their own personal experiences and tell stories of how things are progressing in their organisations. Disclosing what they are in charge of and/or how and why they have encountered unusual experiences caused by their subordinates appears to be of primary interest. It seems that they only need an audience to provide a rich picture of their lives irrespective of the relevance of the stories to the study.

Despite this tendency, which with the benefit of hindsight was also apparent in the first pilot study, participants demonstrated that they really understood the object of the study. However, there was a tendency for some interviewees to talk about either knowledge conversion process or the role of leadership, rather than the relationship

between these objects of inquiry. For instance, one of the participants devoted considerable attention to indicating why knowledge management is important, how it should be conducted and what people can gain from it. He had little to say about leadership despite prompting from the interviewer. On the other hand, other participants only discussed their roles as leaders in the organisation. Although they revealed how their leadership was displayed under different circumstances, they barely related leadership to the knowledge conversion process that they have been asked to address.

Despite these shortcomings, the second pilot study represented a considerable improvement on the first. Interviewees provided more substantive and explicit responses. For instance, one of the participants from the Socialisation group said that *"I would adopt some soft approaches because this kind of conversion involves no hard or tangible knowledge. So it is not good to impose hard rules or regulations"*. Another participant from the same group argued that there is no need for leaders to be involved in Socialisation. She claimed that *"... if you want to talk about Socialisation, changing tacit to tacit ... it takes time and has no direct impact on company's performance, so why would I spend so much time on it?"*. In addition to the conversion of tacit-tacit, the Socialisation group also discussed the conversion of explicit-explicit knowledge. For instance, a participant from the Socialisation group suggested that *"... in many cases, changing explicit knowledge to explicit knowledge could be so time-consuming or even bothering ... Sometimes it is quite boring. So motivation could be insufficient, you have to force them ... Set up timetables. It has to be strict"*. One of the participants from the Combination group said that *"... from my personal point of view, in the explicit part, I would prefer to have much ... it is not good to say control, I hope that I would have much supervision. I would even use a*

bit of enforcement”.

There was a tendency for some interviewees to look at the two knowledge conversion processes differently. For instance, a participant from the Socialisation group said that “... *for tacit to tacit, bonuses could not have any effect since you have no idea of how to evaluate it ... Because if adopting bonus systems, you have to tell them standards ... It has to be quantified, set up targets. But does someone really gain this kind of knowledge? I really do not know. Applying it for explicit to explicit could bring better effect*”. Likewise, a participant from the Combinations group claimed that “*about explicit, you just have to control its quality, because you can quantify it, see the result, control it and adjust it. About tacit, because there is no solid thing, so it is hard to manipulate. Because tacit thing is much implicit, it is hard to make it clear. So, when managers manipulate or execute it, it could not be so direct*”.

A member from the Combination group revealed why and how these two kinds of the knowledge conversion processes should be considered differently from a leadership perspective.

“Basically, as regards explicit conversion, because it involves much which can be quantified, I would prefer to exercise strong management, intervention or control. This approach can be efficient and it saves time. For explicit to explicit conversion, good management can shorten the time and costs of the process. But tacit to tacit requires time. It involves culture. For that kind of thing, leaders cannot always purposively intervene. I think it requires personal encouragement to allow people to become involved gradually. In this way, people accept and feel the

benefits of sharing".

Six out of twelve participants argued that knowledge conversion processes must be considered differently. In other words, up to half of the interviewees believed that they would lead Socialisation and Combination processes in different ways.

5.5.2 Quantitative findings

The *t*-test was adopted to determine whether the two groups differ. Because it is necessary to test the extent to which the means of the two independent groups differ, the two-sample *t*-test was used (Bernard, 2000). According to Table 5.5, there are no significant differences between the two groups for overall leadership ($t = 1.226$, $df = 9$, $p > 0.05$), transformational leadership ($t = 1.693$, $df = 9$, $p > 0.05$) and transactional leadership ($t = 0.358$, $df = 9$, $p > 0.05$). Whilst examining all of the sub-factors of both kinds of leadership in detail, there is only one factor showing the effect of significant difference, *Idealized Influence (Attributed)* ($t = 2.781$, $df = 9$, $p < 0.05$). This result confirms the finding of the first pilot study. However, in this case, the results appear to reveal a new insight into the research question due to the improvement in the qualitative data collected. It appears that Socialisation is a process which requires greater leadership qualities; scores are consistently higher for the Socialisation group, and this is particularly true of idealised influence. The interviews suggested that Combination requires efficient expediting of the process whilst Socialisation requires more thoughtful leadership.

5.5.3 Discussion

Although the overall design of the second pilot study appears to represent an improvement over the first, some elements still need to be improved. The first is the

Table 5.5 Means, Standard Deviation and t-Test of the second Pilot Study

Overall			Socialisation			Combination			t-Test			
	n	M ¹¹	SD	n	M	SD	n	M	SD	t	df	2-Tail Sig.
LEADERSHIP	11	2.4483	0.3215	6	2.5542	0.2857	5	2.3213	0.3454	1.226	9	0.251
Transformational	11	2.9364	0.4019	6	3.1083	0.3231	5	2.7300	0.4192	1.693	9	0.125
IIA ¹²	11	2.7727	0.6657	6	3.1667	0.4655	5	2.3000	0.5701	2.781	9	0.021
IIB ¹³	11	2.8864	0.6261	6	3.0833	0.7012	5	2.6500	0.4873	1.163	9	0.275
IM ¹⁴	12	3.1042	0.7108	6	3.4167	0.4378	6	2.7917	0.8279	1.635	10	0.133
IS ¹⁵	12	3.0833	0.4438	6	3.2083	0.3680	6	2.9583	0.5103	0.973	10	0.353
IC ¹⁶	12	2.7292	0.4191	6	2.6667	0.3416	6	2.7917	0.5103	-0.499	10	0.629
Transactional	11	1.9602	0.3856	6	2.0000	0.4524	5	1.9125	0.3325	0.358	9	0.729
CR ¹⁷	11	3.1591	0.6826	6	3.3333	0.3028	5	2.9500	0.9747	0.920	9	0.381
MEA ¹⁸	12	2.3542	0.5979	6	2.3333	0.7528	6	2.3750	0.4677	-0.115	10	0.911
MEP ¹⁹	12	1.1042	0.7266	6	1.3333	0.4916	6	0.8750	0.8909	1.103	10	0.296
LF ²⁰	12	1.0833	0.7256	6	1.0000	0.8660	6	1.1667	0.6258	-0.382	10	0.710

¹¹ Mean scores of 0 is "Not at all", 1 is "Once in a while", 2 is "Sometimes", 3 is "Fairly often" and 4 is "Frequently, if not always".

¹² Idealized Influence (Attributed)

¹³ Idealized Influence (Behavior)

¹⁴ Inspirational Motivation

¹⁵ Intellectual Stimulation

¹⁶ Individualized Consideration

¹⁷ Contingent Reward

¹⁸ Management-by-Exception (Active)

¹⁹ Management-by-Exception (Passive)

²⁰ Laissez-faire

description. As a whole, the use of descriptions appears to be better than the use of scenarios. However, some participants in this pilot study seem to need additional information particularly since there was a possibility that Socialisation was interpreted in its more general sense related to enculturation rather than the specific task-related sense. Both meanings are evident in the explanations provided by Nonaka and Takeuchi (1995) but attempt to remove ambiguity appear to be desirable. The description is possibly not informative enough. Another element that needs to be reconsidered is concerned with the criterion of selecting those who were recruited for the study. In the two pilot studies, the criterion was only leadership experience. However, in both studies, participants talked about knowledge conversion processes, but they were keen to discuss their own backgrounds. This feature of the two pilot studies could be made a strength of the main study if attention is paid to matching the backgrounds of interviewees with particular knowledge conversion processes. Additionally, the pilot studies were small scale and this may have influenced in particular the difficulty of discovering differences between the groups at a statistical level.

These considerations lead to the need to make three changes in the research design. The first is the need to strengthen the description. The second concerns reviewing the subject's background. A problem with the pilot studies may be that the participants' industrial backgrounds have been so various that background has confounded the results. To minimise the influence caused by background, it may be necessary to apply some form of constraint. The final change will be to increase the scale of the study. If the study is to be more reliable, the number of interviewees has to be increased considerably. Additionally, it is reasonable to believe that the greater the number of interviewees, the greater the opportunity for the questionnaire results to

reveal differences. To sum up, the second pilot study has produced useful insights which can be used to strengthen the design of the main study.

5.6 PHASE III – MAIN STUDY

To focus managers' attention on the knowledge conversion processes, the descriptions were extended and clarified. Additional material was introduced based upon Nonaka and Takeuchi (1995). The survey instruments are shown as Appendix E and they were assessed by panel members of this research for validity as explained in the next chapter. All the written materials were translated into Taiwanese and are presented as Appendix F. In addition, the questions being asked about knowledge conversion processes and their relationships with leadership were modified. They comprised: "In your opinion, which kind of leadership supports knowledge management as described in Section B?", "Can you give me any example of where leadership supported knowledge management as described in Section B?", "Do you think that the kind of leadership that you have been talking about applies only to this situation?", "Can you think of any other kinds of knowledge management? If so, can you please give examples?" and "What kind of leadership do you think is appropriate in these other kinds of situations?". The design of the main study therefore sought to ensure that managers would talk about the descriptions.

Notwithstanding that the research design was intended to focus managers' attention on the descriptions, experience of working with managers through the pilot rounds suggested that managers would sometimes draw upon their experience in talking through the links between knowledge management and leadership. In order to benefit from the possibility that managers might also talk about their own experience, the study returned to Nonaka and Takeuchi (1995) and built upon the observation that

combination relates to IT/IS. This is because according to Nonaka and Takeuchi's definition, combination involves adding, sorting and categorising explicit knowledge such as technical and other quantifiable data, and this is relevant to those who are working in IT/IS departments. For socialisation, the situation is less clear but the bread-making example draws a direct link between apprenticeship and socialisation. So, the choice of production was intended to draw upon knowledge management in situations where apprenticeship might be in operation. The intention of selecting production and IT/IS managers was the possibility that managers would have appropriate experience of socialisation and combination, based upon analysing the examples given in Nonaka and Takeuchi. However, it must be emphasised that the focus of the implementation of the research design was the use of descriptions of socialisation and combination to link knowledge conversion processes and leadership.

Twenty managers from Production departments or backgrounds were chosen for the Socialisation group. Similarly, twenty managers from Information Technology (IT) or Information System (IS) departments or backgrounds were allocated to the Combination group. All forty managers came from a wide range of industries, including high-tech industry, banking, manufacturing, public sector and retailing. The subjects were fairly senior in terms of age and experience: 67% were above the age of forty-one and 95% had working experience of more than six years. The distribution of gender was unbalanced with 93% of the subjects (thirty-seven out of forty) being male. This imbalance seems to be broadly representative of leadership in Taiwan. According to the report in 2006 by the CCIS (China Credit Information Service, Ltd.) in Taiwan, 88.6% of the managers in the listed companies of Taiwan Stock Exchange Corporation are male. Information on the managers is summarised

as shown in Table 5.6.

Table 5.6 *Descriptions of the Samples of the Main Study*

<i>Factors</i>		<i>Quantity</i>	<i>Percentage</i>
GENDER	Male	37	93%
	Female	3	7%
AGE	21 ~ 30 Years Old	0	0%
	31 ~ 40 Years Old	13	33%
	41 ~ 50 Years Old	22	55%
	Above 50 Years Old	5	12%
EXPERIENCE	Less than 3 Years	0	0%
	3 ~ 5 Years	2	5%
	6 ~ 8 Years	2	5%
	Above 8 Years	36	90%

Compared with the pilot studies, the procedures adopted were broadly comparable. The survey was conducted by following the steps as below. First of all, a little time was spent explaining that the survey was about knowledge management and leadership. Next, the subjects were asked to tick appropriate boxes for “Personal Information” in Section A, including information such as gender, age and years of working experience. The subjects were then requested to read “Description” in Section B, which provided an explanation of either Socialisation or Combination depending upon the group. Next, the semi-structured interview schedule was conducted, referring to the questions mentioned earlier. After that, the subjects were invited to read Section C and then to fill in the MLQ. Their attention was once again directed to the Description, comprising an explanation of either Socialisation or Combination. Next, the results of the questionnaire were discussed, particularly a sample of items where the subject responded at the extreme. Finally, the subjects were thanked for their participation in the study. In this study, the managers were

visited in their workplaces in Taiwan. From forty to sixty minutes were spent with each subject, and all the interviews were recorded and transcribed.

5.7 SUMMARY

This chapter addresses the design of the research. Attention was first paid to revealing the research strategy. Research instruments of scenario and the MLQ were then discussed. Afterwards, two pilot studies were described. The first pilot study formed the basis for the second pilot study which in turn formed the basis for the main study. Compared with the first pilot study, the second pilot study provided encouraging results and indicated potential for further investigation. In relation to the main study, this chapter outlined who were involved, why they were involved and how the study was conducted. Regarding the findings of the main study, they will be discussed at length in subsequent chapters. In the next chapter, attention will be directed to the issues of – reliability and validity.

6

RELIABILITY AND VALIDITY

6.1 INTRODUCTION

This chapter outlines how reliability and validity are examined for this study. It starts with providing an overview of reliability. Afterwards, the approaches of Cronbach's alpha and meta-analytic review are introduced and discussed in relation to this study. Attention is then turned to the issue of validity through consideration of the two approaches of face/content validity and construct validity.

6.2 RELIABILITY

The issue of reliability relates both to knowledge conversion processes and leadership. Given the nature of the instruments adopted, however, attention here is going to be paid to the reliability of the MLQ. In other words, the next sections will examine whether the results generated by the MLQ in this study are reliable. Reliability in general refers to the extent to which a measure would "produce the same result from one occasion to another" (Clark-Carter, 1997, p. 27). In brief, it involves a measure's consistency (Bryman and Cramer, 2001) or repeatability (Reaves, 1992). According to Bryman and Cramer (2004), there are two aspects to be considered: external and internal reliability. External reliability concerns the degree of stability of a measure over time, meaning that if a measure is externally reliable, it will be able to produce a very similar result on two or more occasions (Clark-Carter, 1997). Internal reliability, however, refers to multiple-item scales. If a measure is

internally reliable, this means that the items that make up the scale are measuring the same idea (Bryman and Cramer, 2001). These two aspects will be applied to the reliability of the MLQ.

6.2.1 Cronbach's alpha

There are two techniques that can be used to determine internal reliability: split-half reliability and Cronbach's alpha (α). The former entails randomly dividing the items into two groups or halves and then computing how well they relate to each other (Bryman and Cramer, 2001). Clark-Carter (1997) argues that this measure of reliability suffers from two inherent disadvantages: firstly it is "partly affected by the number of items in a test"; and secondly the way of dividing the items into two groups is "somewhat arbitrary" (p. 337). Given these shortcomings, the second technique, called Cronbach's alpha, has been devised. The reliability coefficient of Cronbach's alpha is roughly equivalent to the average of all possible split halves. This measure has therefore come to be regarded as the most common technique of examining internal reliability (Bryman and Cramer, 2001, 2004). In terms of interpreting the results of the calculation, although some people have argued that it depends upon the circumstances of the study (Pedhazur and Schmelkin, 1991), the rule of thumb is that alpha should never be below 0.7 (Clark-Carter, 1997) or 0.8 (Bryman and Cramer, 2001, 2004). If alpha is below 0.7 or 0.8, further investigation would need to be conducted.

In the main study, Cronbach's alpha was used as an internal reliability technique to measure how reliable the MLQ was for both knowledge conversion processes taken together. The results are summarised in Table 6.1. Cronbach's alpha for overall leadership is 0.808 which is around the generally accepted level of 0.7 or 0.8,

although some of the individual scales are relatively low. For instance, Cronbach's alpha for Intellectual Stimulation (IS) is 0.424 and for Contingent Reward (CR) is 0.498. Given this, it can be argued that the reliability of some of the MLQ scales is in question when both knowledge conversion processes were taken into account. Having surveyed one aspect of reliability, the next section begins to inspect the other aspect – external reliability of the MLQ.

6.2.2 Meta-analytic review

As mentioned earlier, external reliability concerns the extent to which a measure can produce similar results over time. In this case, meta-analysis is regarded here as a technique to measure whether the MLQ used in this study is externally reliable. The reasoning behind this notion is that as long as it can be proved that the pattern of the MLQ results of this study is similar to that of other previous studies, it can be inferred that the MLQ is reliable. So what is meta-analysis? According to Glass (1976), there are three levels of analysis in research: primary analysis, secondary analysis and meta-analysis. Primary analysis implies that researchers analyse the results of data gathered by themselves; secondary analysis is concerned with re-analysing the primary data for the purpose of answering original or new research questions; meta-analysis refers to synthesising the analyses of independent studies (Antonakis, Schriesheim, Donovan, Gopalakrishna-Pillai, Pellegrini and Rossomme, 2004). Howell (1992) argues that meta-analysis is about extracting “inferences about an area of research” from the results of other relevant studies (p. 192). It is named meta-analysis because it in fact is an analysis of the analysis (Robson, 2002). A meta-analytic review of those studies that use the MLQ will therefore be presented next. After that, focus will be turned to whether this study follows the pattern of other studies and thus whether this study can be argued to have external reliability.

Table 6.1 *Reliability and Item-Total Statistics*

Factor	N of Items	Cronbach's Alpha Based on Standardised Items	Cronbach's Alpha
OVERALL	9	0.819	0.808
TF Leadership	5	0.857	0.851
IIA ²¹	4	0.654	0.654
IIB ²²	4	0.544	0.521
IM ²³	4	0.649	0.655
IS ²⁴	4	0.442	0.424
IC ²⁵	4	0.679	0.598
TA Leadership	4	0.613	0.624
CR ²⁶	4	0.514	0.498
MEA ²⁷	4	0.639	0.636
MEP ²⁸	4	0.552	0.513
LF ²⁹	4	0.629	0.615

6.2.2.1 Other studies

Although the theories of transformational and transactional leadership have been around for quite a while and cover studies in a wide range of settings including military, business and educational institutions, and at the different levels of top management, middle management and first-line supervision levels (Lowe, Kroeck and Sivasubramaniam, 1996), meta-analytic studies of the MLQ literature are relatively rare, compared with other examples of meta-analyses in the leadership field (Antonakis et al., 2004). This is probably due to researchers being reluctant to understand the relationships among the various characteristics included in the transformational and transactional leadership frames (Lowe et al., 1996). Yet, the situation has changed since 1996. In particular, several meta-analyses have been

²¹ Idealized Influence (Attributed)
²² Idealized Influence (Behavior)
²³ Inspirational Motivation
²⁴ Intellectual Stimulation
²⁵ Individualized Consideration
²⁶ Contingent Reward
²⁷ Management-by-Exception (Active)
²⁸ Management-by-Exception (Passive)
²⁹ Laissez-faire

conducted to explore the relationship between the theory of transformational and transactional leadership and other factors such as effectiveness and performance (e.g. Rowold, 2005). The most convincing examples are Fuller, Patterson, Hester and Stringer (1996), Lowe et al. (1996) and Judge and Piccolo (2004). The study by Fuller et al. (1996) will not be considered here because they focus on charismatic leadership and the issue of the compatibility of charismatic and transformational leadership has yet to be decided (Yukl, 1999a).

The analyses provided by Lowe et al. (1996) and Judge and Piccolo (2004) are thus considered here. There are thirty-nine studies included in the Lowe et al.'s (1996) analysis, among which twenty-two are published in journals and books, and the rest are unpublished studies, including dissertations, conference proceedings and working papers. Judge and Piccolo (2004) include sixty-eight journal articles, eighteen dissertations and one unpublished data set, making the total number of eighty-seven studies. The study by Judge and Piccolo is "the largest review to date" (p. 764). Various findings have been revealed by these analyses. Focusing on the components within transformational and transactional leadership, there is a high intercorrelation not only between the transformational scales, but also between these transformational scales and the transactional scale of *contingent reward* (Lowe et al., 1996; Judge and Piccolo, 2004). The most consistent correlations are shown between transformational leadership and *contingent reward* leadership across the leadership criteria. In addition to *contingent reward*, the scale of *laissez-faire* is strongly correlated with transformational leadership, but this relationship is negative.

The most crucial of the remaining findings is concerned with leader's effectiveness. Lowe et al. (1996) suggest that overall a positive relationship between effectiveness

and transformational leadership has been shown across various contexts, and *idealized influence* enjoys the strongest relationship with this factor. Besides *idealized influence*, the other scales of *individualized consideration*, *intellectual stimulation* and *contingent reward* are also found to have positive correlations with effectiveness across studies. A scale that has often revealed a negative but low correlation with effectiveness is the transactional scale of *management-by-exception* (Lowe et al., 1996). Having considered the findings of other previous studies, the next thing to do is to see whether the results of this study are consistent.

6.2.2.2 This study

The most important finding in the meta-analysis of the MLQ literature is that transformational leadership and transactional leadership are by no means opposite ends of a continuum (Lievens, Van Geit and Coetsier, 1997). They are in fact complementary (Judge and Piccolo, 2004). Given this, the relationships between the scales of transformational and transactional leadership for the present study are investigated. Table 6.2 summarises the results. As a whole, this study is clearly consistent with the meta-analysis of the MLQ literature. This assertion can be interpreted from four perspectives. The first refers to the relationship between the transformational scales. As revealed by Table 6.2, these scales [*idealized influence (attribute)*, *idealized influence (behavior)*, *inspirational motivation*, *intellectual stimulation* and *individualized consideration*] are positively correlated with each other, and the correlations are significant at the either 0.01 or 0.05 level (two-tailed). The second perspective is concerned with the relationship between transformational leadership and the transactional scale of *contingent reward*. Again, Table 6.2 indicates that *contingent reward* shows positive association with transformational leadership as a whole and with every individual characteristic of transformational

Table 6.2 Descriptive Statistics and Correlations of the Main Study

Variable	M	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Transformational Leadership	2.8375	0.4682	-													
Transactional Leadership	1.9786	0.4370	.428**	-												
Personalized Influence (Attributed)	2.7375	0.6479	.859**	.391*	-											
Personalized Influence (Behavior)	2.8063	0.5951	.796**	.389*	.605**	-										
Inspirational Motivation	2.9250	0.5807	.816**	.165	.671**	.606**	-									
Intellectual Stimulation	3.0375	0.4687	.800**	.430**	.640**	.595**	.535**	-								
Individualized Consideration	2.6813	0.6455	.716**	.333*	.485**	.382*	.439**	.501**	-							
Contingent Reward	2.9688	0.5286	.636**	.482**	.406**	.525**	.493**	.606**	.529**	-						
Management-by-Exception (Active)	2.5769	0.7028	.622**	.774**	.569**	.507**	.392*	.590**	.424**	.500**	-					
Management-by-Exception (Passive)	1.2063	0.5880	.038	.736**	.146	.085	-.137	.006	.030	-.005	.301	-				
Perceived Fairness	1.1538	0.7015	-.096	.721**	-.041	-.035	-.240	-.034	-.034	-.107	.280	.655**	-			
Extra Effort	2.9083	0.6405	.727**	.192	.476**	.619**	.671**	.595**	.553**	.572**	.264	-.051	-.187	-		
Effectiveness	3.0128	0.5589	.674**	.316	.499**	.695**	.582**	.581**	.399*	.496**	.560**	-.029	-.138	.646**	-	
Satisfaction	3.0125	0.7025	.765**	.239	.719**	.497**	.702**	.553**	.560**	.579**	.473**	-.100	-.240	.497**	.641**	-

** . Correlation is significant at the 0.01 level (two-tailed).

* . Correlation is significant at the 0.05 level (two-tailed).

leadership.

Another finding that is worthwhile to pay attention to is that *contingent reward* enjoys a closer relationship with transformational leadership, rather than with transactional leadership taken as a whole. To a certain extent, this means that from the manager's point of view, the transactional scale of *contingent reward* could be seen as important as the transformational scales. The third perspective that supports the aforementioned assertion is that the transactional scale of *laissez-faire* has negative correlations with all the transformational scales, which is in line with the finding of the meta-analyses. *Laissez-faire* is also negatively related to *contingent reward*.

The final perspective involves the relationship between the MLQ measure of effectiveness and transformational and transactional scales. Table 6.3 summarises the separate results of regression analysis. According to the table, variance inflation factors (VIF) of transformational and transactional scales were below 2.50, meaning that there is no serious problem in using multiple regression (Belsley, Kuh and Welsch, 1980). The results showed that the relationship between the measure of effectiveness and transformational leadership was significant ($F_{3,33} = 8.249$, $p < 0.05$. Adjusted R square = .488) with significant variable of *idealized influence (behavior)*. In this regard, this study is in accordance with the previous research findings (Lowe et al., 1996). Regarding the relationship between the measure of effectiveness and transactional leadership, it was also significant ($F_{4,32} = 6.425$, $p < 0.05$. Adjusted R square = .376) with significant variable of *management-by-exception (active)*. This result is different from the previous research findings because according to Lowe et al., the measure of effectiveness has been positively correlated with *contingent reward* but negatively correlated with *management-by-exception*. Given the aforementioned

Table 6.3 Results of Regression Analysis regarding the measure of Effectiveness

Variables	Effectiveness		Collinearity Statistics	
	β	t	Tolerance	VIF
TF Leadership				
Idealised Influence (Attributed)	-.108	-.596	.410	2.438
Idealised Influence (Behavior)	.485	2.974	.507	1.972
Inspirational Motivation	.273	1.615	.470	2.126
Intellectual Stimulation	.214	1.279	.482	2.076
Individualized Consideration	-.027	-.183	.638	1.569
Adjusted R square	.488			
F	8.249 ³⁰			
TA Leadership				
Contingent Reward	.122	.759	.671	1.490
Management-by-Exception (Active)	.613	3.602	.598	1.672
Management-by-Exception (Passive)	-.070	-.388	.538	1.860
Laissez-Faire	-.236	-1.317	.541	1.849
Adjusted R square	.376			
F	6.425 ³¹			

findings and comparisons, it is reasonable to conclude that this study is reliable from both internal and external perspectives but only to an extent that suggests that caution needs to be exercised in interpreting findings.

6.3 VALIDITY

By definition, a measure has validity when it measures the concept that it is supposed to measure (Bryman and Cramer, 2001, 2004). Singleton, Straits, Straits and McAllister (1988) argue that compared with reliability, the assessment of validity is “more problematic” (p. 117). This is because although Bryman and Cramer (2004)

³⁰ P < 0.05 with significant variable of *idealized influence (behavior)*
³¹ P < 0.05 with significant variable of *management-by-exception (active)*

argue that validity requires reliability, a very reliable measure may still be invalid because the investigator could be “measuring very reliably something other than what (he or she) intended to measure” (Singleton et al., 1988, p. 111). From Reaves’s (1992) point of view, the difficulty is due to the need for the investigator to have some “independent idea” of what he or she is trying to measure (p. 81).

There are several ways to assess validity. The first and the most elementary one refers to *face validity*, which simply concerns whether a measure appears to be valid at face value. Reaves (1992) suggests that to assess *face validity*, it is necessary to ask an independent expert to look at the measure and provide a judgement as to its validity. The second assessment is *content validity*, which is concerned with the extent to which a measure covers all facets of a concept being measured (Clark-Carter, 1997). Singleton et al. (1988) categorise *face validity* and *content validity* as subjective judgements because these two assessments involve subjective evaluation.

Singleton et al. (1988) argue that there are other kinds of validity assessments which are based upon objective evidence. Probably, the most important kind of validity assessment is called *construct validity*. According to Zumbo and Rupp (2004), this is “the totality of validity theory and that its discussion is comprehensive, integrative, and evidence based” (p. 84). Clark-Carter (1997) argues that the higher the *construct validity*, the better the theoretical construct assessed by a measure. This is because *construct validity* concerns how to specify theoretical inferences that are relevant to the construct and then to provide tests (Bryman and Cramer, 2004). So to what extent can *construct validity* be determined? Reaves (1992) suggests that investigators have to make a comparison between their measure and accepted measures of related

constructs to see whether their relationships are as expected. Singleton et al. (1988) propose four kinds of common evidence that can be used to establish *construct validity: correlations with related variables, correlations with unrelated variables, consistency across indicators and different methods of measurement and differences among known groups*. The first is based upon an inference that a measure with high validity should be highly correlated with “measures of other theoretically related variables” (p. 121). The second is the opposite of the first. The third involves the idea that different measures that are designed to evaluate the same concept should be correlated with each other. The final entails comparing groups’ responses as long as groups are “expected to differ on the measure of a concept” (p. 122). Having introduced several kinds of validity, the next section will move on to consider the extent to which the scenarios/descriptions and the MLQ are valid in this study.

6.3.1 Face and content validity

As discussed previously, *face validity* is concerned with asking those who are not particularly familiar with the specific research programme to evaluate whether the relevant measure is valid. People who are invited to play the role of evaluator in this study come from the panel members of this research. The panel dedicated to oversee the development of this research is formed by two members – Professor Joe Peppard and Professor Neil Doherty. As a Professor of Information Systems, Joe held the Chair in Information Systems in Loughborough University at the time of the main study. Neil is currently Professor of Information Management also at Loughborough University. Both scholars’ research interests are in the areas of information systems and technology strategy and management, and they have had papers published in a wide range of academic journals. With the participation of the panel members, this study benefited in two respects. First, the opinions formed by the panel members

would tend to be objective. This is because, referring to *face validity*, they have not been involved in this study at a detailed level. Secondly, notwithstanding the fact that they are independent, they are experienced in academic work. So, compared with other participants who may provide plausible suggestions, the panel members would be more likely to deliver constructive and realistic recommendations.

The review of the panel members took place after the administration of the second pilot study and before the conduct of the main study. A number of recommendations were made. First, they suggested that the semi-structured interview questions should be redesigned so as to be more relevant to the description of the specific knowledge conversion process by introducing new questions. They argued that the purpose of the reinforcement provided by descriptions and questioning is to focus the interviewee's mindset before filling in the questionnaire. Second, they suggested that the result of the questionnaire should be checked immediately and if the item is scaled abnormally, a further interview should be conducted. In accordance with the recommendations provided by the panel members, more interview questions were added accordingly. These included: "*Where can leadership support knowledge management as revealed in the Description section of the material?*" and "*Is there any other kind of knowledge management apart from the one in the Description section and if so, which kind of leadership is appropriate?*". Also, further interview questions were asked where the result for any question was at the extreme.

6.3.2 Construct validity

Construct validity can be assessed in relation to the MLQ and transformational and transactional leadership styles. The scales for *idealized influence (attributed)*, *idealized influence (behavior)*, *inspirational motivation*, *intellectual stimulation* and

individualized consideration are designed to measure transformational leadership, whilst the scales of *contingent reward*, *management-by-exception (active)* and *management-by-exception (passive)* examine concepts relevant to transactional leadership. Thus, a test of construct validity can be based on the completion of the MLQ by managers involved in the main study. According to Black (1999), three approaches can test *construct validity* and one of which refers to factor analysis. This is because through calculating correlations between variables, factor analysis allows researchers to assess whether the variables are measuring the same concept (Robson, 2002). Procter (2001) argues that this process of making sense of the relationship between variables is the essence of construct validity.

So at what level should factor analysis be based upon for this study? It seems that the factor analysis cannot be conducted on the basis of the whole set of transformational and transactional scales. This is simply because the sample size is too small to be able to conduct factor analysis at this level. As an alternative, the factor analysis could be based upon each transformational or transactional scale to see whether the items under a particular scale are of measuring the same concept. Table 6.4 summarises the results of this approach to factor analysis and shows that most of the scales are single-factored. However, for the scales of *idealized influence (behavior)* and *intellectual stimulation* two factors result, indicating that these measures are not valid. So in terms of construct validity, it can then be argued that the results of this study are valid only to some extent. In this regard, this study reflects Yukl's (1999a) criticism of the MLQ's conceptual ambiguity.

6.4 LIMITATIONS

On the whole, this study can be regarded as having some reliability and validity, and

this is consistent with other MLQ studies. It is reliable because as a whole the pattern of this study is consistent with that of other studies using the MLQ; it is valid to the

Table 6.4 *Factor Analysis of the Main Study*

Scale	One Factor	Two Factors
Idealized Influence (Attributed)	※	
Idealized Influence (Behavior)		※
Inspirational Motivation	※	
Intellectual Stimulation		※
Individualized Consideration	※	
Contingent Reward	※	
Management-by-Exception (Active)	※	
Management-by-Exception (Passive)	※	

extent that it measures what it intends to measure as assessed through face validity and limited factor analysis. Notwithstanding this conclusion, there are limitations to be addressed. One of the limitations is that just one dimension of reliability was considered in this study. In other words, this study only addressed the issue of reliability from the point of view of the MLQ. It fails to take other dimensions into account. For instance, there is no indication of whether the research design of combining scenarios/descriptions of knowledge conversion processes and leadership as measured by the MLQ can produce consistent results over time. In other words, it is not yet known if another set of subjects are to be involved in the future, the same result would arise. This is a limitation of the exploratory nature of the research.

Another limitation refers to the extent to which the managers' opinions about leadership and its relations to knowledge conversion processes were reliable and valid. As this study is designed to investigate what kind of leadership should be

appropriate for a particular knowledge conversion process, the research instruments sought to create a context in which participants adopt a mindset relevant to a particular knowledge conversion process. The use of descriptions of Socialisation and Combination were designed to ensure this. However, it is difficult to ensure that whilst filling in the questionnaire, or being interviewed, participants were absolutely in the designated mindset. There was some evidence from the interviews that they were just showing a general consideration for what an ideal leader should be like or they revealed ideas about getting along with their followers in general terms.

However, it must be emphasised that managers did, indeed, address the descriptions of socialisation and combination and considered these concepts in their responses. There was clear evidence in the interviews that managers were talking about the descriptions, as intended in the research design. For instance, Manager S-002 said that “under the circumstances of changing explicit knowledge to another kind of explicit knowledge, everyone will be a bit different in judging the data unless it involves mathematical or scientific formulas. If it has to do with mathematic or scientific formulas, the result will be much more accurate. If it is about judging information such as the trend of share price, different people will have different perspectives even about the same numbers”. Similarly, Manager S-008 suggested that socialisation “is a process of influencing unobtrusively and imperceptibly”. He suggested that “when you talk about tacit knowledge, this requires personal experience”. A third example is provided by Manager C-011, who argued that “as regards explicit knowledge, this deals with the hard and factual, and you can develop good ways to guide it”. Throughout, the design and implementation of the research aimed to focus managers’ mindsets on the leadership requirements for specific knowledge conversion processes. Even so, care must still be taken in interpreting

results because reliability and validity considerations need to acknowledge that managers sometimes drew upon experience that cannot be related directly to the propositions under investigation. Interview results need to be carefully interpreted.

Improving the validity of the research has been a continuous process. In the first pilot study, managers were asked to match the scenarios and knowledge conversion processes. In consequence, most of the managers failed to match the scenario with a particular knowledge conversion process, meaning that in this case the scenarios showed no validity. As a result of this, the second pilot study replaced scenarios by descriptions which illustrate the characteristics of knowledge conversion processes directly. An improvement was shown in this pilot study because descriptions seemed to be delivering valid messages even though some managers still talked primarily about their backgrounds. Based upon the second pilot study, the main study matched the backgrounds of managers with particular knowledge conversion processes. Again, this way of designing the study tried to increase the extent to which the managers' responses to the research question were valid. So notwithstanding this is an exploratory research, its validity has been pursued from beginning to end.

6.5 SUMMARY

This chapter deals with reliability and validity. Attention is first directed to the concept of reliability and then to examining this study in terms of its reliability. The study was shown to be reliable from the perspective of the MLQ although there are limitations. Next, the issues of validity in general and the validity of this study in particular were addressed. The results suggest that overall this study is to some extent valid even though there are limitations. In the next chapter, attention will be paid to the way to analyse qualitative data.

7

DATA ANALYSIS

7.1 INTRODUCTION

This chapter explains the analysis of the qualitative data. First of all, attention is drawn to the nature of the data and how it was processed. The application of computers to qualitative research in general and to this study in particular is then considered. The chapter then moves on to consider the role of the MLQ in the analysis. The chapter finally explains the approach that was adopted and describes the cross-case basis for the analysis. This chapter provides an overview of the qualitative study as a basis for subsequent chapters (Chapters 9 and 10), which present findings.

7.2 THE NATURE OF THE DATA

This chapter will start by providing a general description of the way the data was obtained and how it was initially processed. There were two phases as regards processing the data. As mentioned earlier, all the forty interviews were recorded. So the first phase was to make transcripts from the tapes. This served two purposes: firstly to create a copy so that the data would not be lost if the tape was damaged; and secondly to provide a basis for subsequent steps in the process. The second phase was to translate the transcripts into English because the original interviews were conducted in Taiwanese. The major challenge in terms of the translation was that sometimes it was difficult to find appropriate English phrases for the colloquial

expressions used by the participants. It was decided to make literal translations in the first instance and these are presented as Appendix G. These literal translations were then further refined in order to develop quotations which are presented in subsequent chapters.

Almost four months were spent solely on these two phases of data processing. The data obtained from the forty interviews were rich in the sense that the managers not only revealed their opinions about leadership but also expressed different ways of considering knowledge conversion processes and/or knowledge management. In addition, they talked about their everyday lives and the contexts in which they exercised leadership. Although the information about the managers' working lives and contexts can only be seen as background information, it still plays an important role in this study. This is because without such information, it would not be possible to understand the reasons why particular explanations for leadership behaviour were provided. In other words, this information provides contextual detail necessary to understand leadership and knowledge management. This contextual detail related primarily to the leaders' roles within production and IT/IS departments. Before moving on to explaining the analysis, the issue of the use of computers in qualitative research will be discussed next.

7.3 COMPUTERS IN QUALITATIVE RESEARCH

Modern technologies help to deal with enormous data that can be gathered during qualitative studies. Before talking about the case of the study presented in this dissertation, the relationship between computers and qualitative research will first be elaborated in general terms.

Computer technologies have long been associated with qualitative research. As early as in the mid 1960s, software was designed to deal with textual data. However, it was not until the 1980s that qualitative researchers found that computers could be taken seriously as an indispensable tool for the analysis of data (Kelle, 2000; Lee and Fielding, 1991). One can argue that this change resulted from the development of personal computer and word processing. Now, computer support for qualitative data analysis seems to become a popular tool for researchers. Using computers to manage qualitative data has now become a “respectable and accepted strategy” (Lewins, 2001, p. 302). The popularity of using computers in qualitative research is reflected in the considerable number of software programmes available. Kelle (2000) argues that there are at least twenty different software packages available for researchers to work with their textual data. He even regards this field as “the most rapidly developing field in the domain of qualitative methodology” (p. 283).

One of the advantages of using computers in qualitative research is speed (Flick, 2002). Computers can handle, manage, search and retrieve data in a very short period of time. Speed at dealing with data means that more time can be saved and greater efficiency can be achieved (Kelle, 2000). Another advantage is that computers can encourage new ways of working (Lee and Fielding, 1991). Through computers, data or fieldnotes can be transmitted electronically, meaning that, for instance, virtual teamwork is far more likely to happen. As regards those specialist software packages designed to help with qualitative data analysis, which include NUD*IST, advantages are more specific. For QDA (qualitative data analysis) software or CAQDAS (computer-assisted qualitative data analysis software), Flick (2002) indicates that some advanced packages are even able to do what word processors cannot do; for example, handling photos, films, recorded texts and video material. Robson (2002)

summarises several advantages of QDA computer packages; for instance: all materials can be stored and organised in a single location system; users are allowed to have quick and easy access to all materials; large volumes of data can be managed quickly; and coding schemes can remain consistent.

Although computers are helpful in dealing with qualitative data, some researchers still feel uncomfortable about using them. According to Flick (2002), the fear comes from the likelihood that computers will “change or even distort qualitative research practice” (p. 251). Seidel (1991) argues that computing technology is like a “double-edged sword” (p. 108). It is true that computers bring not only benefits but also problems. The most critical attack against computers in qualitative research is that computers jeopardise the relationship between researchers and their data. Kelle (2000) argues that one of the dangers caused by computers is that they can distance researchers from the data. The assertion that computers would lessen researchers’ involvement and interaction with the data is also supported by Seidel (1991).

There are other worries. One of the anxieties is that it is quite easy for researchers to be seduced by the convenience and credibility provided by computers. As long as they are immersed in what computers can offer, they will no longer have a clear awareness of what is involved methodologically and theoretically (Lee and Fielding, 1991). Seidel (1991) claims that fascination with the use of computers means that the research becomes driven by technology. He argues that once researchers are “kidnapped” by technologies, “parts of the social world and social phenomena would be lost” (p. 115). As most programmes are devoted to processing large volumes of data, they may be of less help in handling or examining data beyond the level of coding (for instance, for conversation analysis or certain types of discourse analysis)

(Lewins, 2001; Robson, 2002). According to Seidel (1991), computers even have problems with taking care of large amounts of data. He argues that the attention directed to a particular case will be reduced because time and energy are spread out over a large number of cases. Robson (2002) reveals another limitation of using dedicated software by arguing that if researchers want to become proficient in the use of such software, a certain amount of time and energy has to be committed to the learning process. The problem is that where the project is small, or small amounts of data are involved, over-expenditure of time and effort on the packages may not be worthwhile.

7.3.1 The use of computer technology within this study

Having discussed the role of computers in qualitative research and the advantages and disadvantages, the application of computer technology to this study will now be examined. Obviously, there is no need to live in the pre-computer world where various sources of data had to be processed manually. Most of the hard work in the pre-computer times can now be managed by word processors and dedicated packages. As a matter of fact, word processors have already been shown to be powerful enough to handle complicated text-based data. For instance, copying, cutting, pasting, formatting or moving data between files is no longer a laborious job for packages like Word for Windows. Word processors have the capability to “produce indices, counts of words or phrases, and tables and graphs, “hidden” marking and annotation facilities and more” (Stanley and Temple, 1995, p. 186). The facilities provided by word processors may thus be ample enough to carry out an analysis of textual data. So the crux is whether it is necessary to go further; to use one of the specially written computer programmes to aid data analysis within this study. Seidel (1991) is right that technologies serve, rather than drive, research. It is “the characteristics of the

particular data set being analyzed” which should decide which package is the most appropriate (Stanley and Temple, 1995, p. 174).

A limited number of transcripts was analysed using one of the specialist software packages – Nvivo, to see whether it would be appropriate to use dedicated packages to analyse the data. Upon reflection, it was considered that Nvivo brought insufficient benefit over Word for Windows for this study. Rather, Nvivo produced unnecessary costs to this study as in the first place, the transcripts needed to be changed to the format of Nvivo. Besides, the facilities offered by Nvivo were not necessary because the required analysis was shown to be just as easily carried out using Word for Windows, and there was no desire for this study to build the kinds of model for which Nvivo is particularly useful. Based upon personal experience of both packages, Word for Windows rather than Nvivo was chosen to conduct the qualitative data analysis. It was not only that Word for Windows proved to be at least as good as Nvivo regarding “the fundamentally necessary clerical assistant and data management tasks” (Stanley and Temple, 1995, p. 190), but also because the facilities offered by Word for Windows were sufficient to the analysis required for this particular study.

7.4 THE ROLE OF THE MLQ

Having explained the choice of Word for Windows to support the processing and analysis of data, attention now moves to the analysis itself. The analysis centred on the analytical framework provided by the MLQ. The MLQ was used as a coding reference scheme because, with its structure providing the full range of transformational and transactional leadership characteristics, it seems to be ideal for identifying the behaviour of the managers as they responded to the research

instrument designed to solicit their approach to socialisation or combination. Table 7.1 provides a list of codes based upon the framework of the MLQ. As the table reveals, each code comprises four elements. For the purpose of coding the transcripts, from left to right, numbers are used in turn to represent domain, category, scale and the number of item. So the code of L-TF-IM-03, for instance, refers to the third item of the scale of Inspirational Motivation under the category of Transformational Leadership in the domain of Leadership.

7.4.1 Inter-coder reliability

The test known as inter-coder reliability was conducted in order to assess the reliability of the study and the validity of the coding. The test involves two coders applying the same coding instrument to code the identical materials independently. Inter-coder reliability provides a measure of the amount of agreement between the two coders (Liakopoulos, 2000). Krippendorff (2004) argues that there are three kinds of reliability: stability, reproducibility and accuracy. Reproducibility refers to the extent to which a process can be duplicated “by different analysts working under varying conditions, at different locations, or using different but functionally equivalent measuring instruments” (p. 215). According to Krippendorff, therefore, inter-coder reliability belongs to reproducibility and is one approach to reliability.

So how was an inter-coder reliability test conducted for this study? Firstly, as previously stated, all forty transcripts were translated into English. The transcripts were then broken up into codable chunks to give two hundred and forty-four leadership chunks. The coding structure of Table 7.1 was then applied. The data were coded by (1) the researcher and (2) one of the researcher’s colleagues. The second coder was a postgraduate with several years of working experience. The amount of

Table 7.1 The MLQ Framework for Qualitative Analysis

Domain	Categories	Scales	Items/Descriptions	Codes
Leadership	Transformational Leadership	Idealized Influence (Attributed)	I instill pride in others for being associated with me.	L-TF-IIA-01
			I go beyond self-interest for the good of the group.	L-TF-IIA-02
			I act in ways that build others' respect for me.	L-TF-IIA-03
			I display a sense of power and confidence.	L-TF-IIA-04
		Idealized Influence (Behavior)	I talk about my most important values and beliefs.	L-TF-IIB-01
			I specify the importance of having a strong sense of purpose.	L-TF-IIB-02
			I consider the moral and ethical consequences of decisions.	L-TF-IIB-03
			I emphasize the importance of having a collective sense of mission.	L-TF-IIB-04
		Inspirational Motivation	I talk optimistically about the future.	L-TF-IM-01
			I talk enthusiastically about what needs to be accomplished.	L-TF-IM-02
			I articulate a compelling vision of the future.	L-TF-IM-03
			I express confidence that goals will be achieved.	L-TF-IM-04
		Intellectual Stimulation	I re-examine critical assumptions to question whether they are appropriate.	L-TF-IS-01
			I seek differing perspectives when solving problems.	L-TF-IS-02
			I get others to look at problems from many different angles.	L-TF-IS-03
			I suggest new ways of looking at how to complete assignments.	L-TF-IS-04
		Individualized Consideration	I spend time teaching and coaching.	L-TF-IC-01
			I treat others as individuals rather than just as a member of a group.	L-TF-IC-02
			I consider an individual as having different needs, abilities, and aspirations from others.	L-TF-IC-03
			I help others to develop their strengths.	L-TF-IC-04

Domain	Categories	Scales	Items/Descriptions	Codes
Leadership	Transactional Leadership	Contingent Reward	I provide others with assistance in exchange for their efforts.	L-TA-CR-01
			I discuss in specific terms who is responsible for achieving performance targets.	L-TA-CR-02
			I make clear what one can expect to receive when performance goals are achieved.	L-TA-CR-03
			I express satisfaction when others meet expectations.	L-TA-CR-04
		Management-by-Exception (Active)	I focus attention to irregularities, mistakes, exceptions, and deviations from standards.	L-TA-MEA-01
			I concentrate my full attention on dealing with mistakes, complaints, and failures.	L-TA-MEA-02
			I keep track of all mistakes.	L-TA-MEA-03
			I direct my attention toward failures to meet standards.	L-TA-MEA-04
		Management-by-Exception (Passive)	I fail to interfere until problems become serious.	L-TA-MEP-01
			I wait for things to go wrong before taking action.	L-TA-MEP-02
			I show that I am a firm believer in "If is ain't broke, don't fix it".	L-TA-MEP-03
			I demonstrate that problems must become chronic before I take action.	L-TA-MEP-04
		Laissez-faire Leadership	I avoid getting involved when important issues arise.	L-TA-LF-01
			I am absent when needed.	L-TA-LF-02
			I avoid making decisions.	L-TA-LF-03
			I delay responding to urgent questions.	L-TA-LF-04

agreement between the two coders was one hundred and thirty-eight chunks, representing 57% of all the chunks. The coders agreed that 30% (forty-two chunks) could not be categorised under the framework of the MLQ because they referred to characteristics such as trust and communication. Differences in coding could be explained in terms of existing critiques of the MLQ. For instance, one of the managers revealed that “... *if you perform badly, I will blame you and let you know that I am not satisfied with what you have done*”. This statement was categorised into the scales of *management-by-exception (passive)* (coder 1) and *contingent reward* (coder 2). The explanation for this difference in coding is that one coder believed that the statement stood for negative contingent reward, but the other coder considered it as an action taken after something wrong had occurred.

Further, differences occurred for the scales of *individualized consideration* and *inspirational motivation, intellectual stimulation* and *individualized consideration*. For instance, the statement “... *you have to tell them what they have to learn; what kind of potential knowledge they need. I think doing it this way is better for IT staff*” was categorised into the scales of *individualized consideration* and *inspirational motivation* by the two coders respectively. The difference in coding resulted from one coder regarding the statement as emphasising learning, but the other coder believing that it involved articulating what needs to be done.

Given the result of the inter-coder reliability test, another round of analysis was conducted. In this round, the coding structure was revised and the transcripts were further interpreted. The number of codable chunks to emerge from this process was more than one thousand. There are two reasons for this increase from the first round. One is that the previous leadership chunks were further subdivided as a result of

discussions following the inter-coder reliability test, and the other is that non-leadership chunks were included in the analysis. With regard to the first reason, one of the results was the introduction of the ideas of pan-transformational leadership (PTF) and pan-transactional leadership (PTA). They were introduced to code behaviour which was not considered by the MLQ but was by all means transformational or transactional. Non-leadership chunks included two codes: KM and TXT. The former referred to the managers' opinions about knowledge and knowledge management; the latter concerned the contexts in which the managers were involved. All the codable chunks are presented on the basis of this process as Appendixes H, I, J, K, L, M, N, O and P.

7.4.2 Discussion

An improved version of Table 7.1 was produced as Table 7.2. This table was challenged by a member of the academic staff at Loughborough University in an iterative process which involved detailed discussion of specific chunks of data. So, notwithstanding that the MLQ provides a general framework for how transformational and transactional leadership behaviour can be coded, it can only be regarded as an initial point of reference, however. This is because even though the MLQ is well respected, it may still be incomplete. For instance, Yukl (1999a) argues that theories of transformational and transactional leadership provide an important perception of what effective leadership should be like, but are still far from complete and may even lack clarity. Take *intellectual stimulation* as an example. Yukl argues that the questionnaire says nothing about what the leader should say or do in order to get the follower intellectually stimulated. Besides, it is hard to draw a clear line between *intellectual stimulation*, *individualized consideration* and *inspirational motivation* in some situations. *Management-by-exception (passive)* is another scale criticised by

Table 7.2 *The Coding Framework for Qualitative Analysis*

Domain	Categories	Scales	Codes	Items/Examples			
Leadership	Transformational Leadership	Idealized Influence	L-TF-II	The subject talks about being a role model.			
				The subject talks about trust			
				The subject talks about displaying a sense of power and confidence.			
				The subject talks about the importance of having a strong sense of purpose.			
				The subject talks about capturing hearts and minds.			
				The subject talks about influencing the mindset of subordinates.			
				The subject talks about his/her most important values and beliefs.			
				The subject talks about creating an internal culture.			
				The subject talks about a compelling vision of the future.			
				The subject talks about the need for long-termism.			
				The subject talks about an individual as having different needs, abilities, and aspirations from others.			
				The subject talks about caring or treating subordinates as families.			
				The subject talks about supporting or satisfying subordinates.			
				The subject talks about helping subordinates to develop their strengths.			
				The subject talks about apprenticeship.			
	Pan-Transformational Leadership			L-PTF	The subject talks about a sense of achievement.		
				The subject talks about empowering.			
				The subject talks about positive rewards.			
				The subject talks about negative rewards.			
				Transactional Leadership	Contingent Reward	L-TA-CR	
							The subject talks about providing subordinates with assistance in exchange for their efforts.

Domain	Categories	Scales	Codes	Items/Examples
KM	Pan-Transactional Leadership	Management-by-Exception	L-TA-ME	The subject talks about monitoring or appraising.
			L-PTA	The subject talks about giving targets.
				The subject talks about using systems, procedures and rules to manage subordinates.
			KM	The subject talks about general knowledge or tacit/explicit knowledge.
				The subject talks about knowledge management.
Context				The subject talks about the Socialisation process.
				The subject talks about the Combination process.
			TXT	The subject talks about context.

Yukl. From his point of view, there are two problems associated with this scale. One is that there is no theory to support that this behaviour belongs to transactional leadership and the other is that it seems to have no exchange process; the most important characteristic of transactional leadership involved in this behaviour.

As regards important behaviours which may be missing in the MLQ, Yukl (1999a) suggests that some empowering behaviours such as “consulting, delegating, and sharing of sensitive information” are incorrectly excluded (p. 290). In addition to oversimplifying transformational and transactional leadership and overlooking some important leadership behaviours, the MLQ also suffers from other criticisms, one of which is that the MLQ fails to take situational variables into consideration. It simply assumes that leadership behaviour and its outcomes will be the same in any circumstances. The critique of the MLQ by Yukl appears to be relevant to this study. For instance, some managers mentioned the importance of trust in relationships with subordinates. It is reasonable to conceive of trust as one of the characteristics of transformational leadership. Nevertheless, trust has never been considered as an attribute in the MLQ. On the other hand, some managers claimed that as middle-level leaders, whose responsibility was to take good care of day-to-day operations, they were not entitled to develop corporate vision. In this regard, some items of the MLQ were irrelevant to them because the items failed to take the contexts in which they were involved into consideration. In fact, in indicating the shortcomings of the MLQ, doubt is cast on the validity of this instrument because its main focus is on a two-factor taxonomy of transformational and transactional leadership to the exclusion of other dimensions of leadership. As a result, the MLQ was only considered as a starting point for the qualitative analysis, and as a basis from which to develop insights into possible differences in leadership for knowledge conversion processes.

7.5 CROSS-CASE ANALYSIS

Attention is now turned to the methodological framework for the analysis (within-case analysis or cross-case analysis) (Miles and Huberman, 1994). Within-case analysis is suitable for exploring and explaining a single case in a bounded context. The case can be “an individual in a setting, a small group, or a larger unit such as a department, organization, or community” (p. 90). For some time, however, attention has been turned to more complex settings, and multi-case designs have thus become mainstream. Miles and Huberman suggest that through studying multiple cases, researchers can achieve three aims: increasing generalisability; seeing how processes and outcomes are qualified; and developing more sophisticated and persuasive explanations. To achieve these three aims, they claim that the only way is through cross-case analysis. According to Miles and Huberman (1994), cross-case analysis is centred upon variables or cases so that three different strategies are formed: case-oriented strategy, variable-oriented strategy and mixed strategy. Case-oriented strategy involves examining cases in a set to see “whether they fall into clusters or groups that share certain patterns or configurations” (p. 174); variable-oriented strategy is conceptual and is about searching for relationships among variables across cases; mixed strategy integrates the previous two approaches. Based upon the two focuses and three strategies, Miles and Huberman propose four kinds of display for cross-case analysis. They are partially ordered display, conceptually ordered display, case-ordered display and time-ordered display.

So what kinds of strategy and display are appropriate for this study? In fact, the answer appears in Appendices H to P, given the examination of the full literal translations (Appendix G) under the coding framework (Table 7.2). It can be seen from Appendixes (H to N) that each appendix contains the managers' comments on

the example(s) of a particular leadership code. As the opinions were made on the basis of the knowledge conversion processes, some comments relating to Socialisation (or Combination) were made by IT/IS (or Production) managers because they have also been involved in the other process. So the strategy for Appendixes H to N is variable-oriented and the display is conceptually ordered. Appendix O also uses a variable-oriented strategy and conceptually ordered display, but it considered the managers' comments on relevant issues of knowledge management. Appendix P is concerned with managers' opinions about the context for their involvement in Socialisation and Combination.

7.6 SUMMARY

This chapter addresses the qualitative data analysis. Attention was firstly paid to the processing of the data and the use of computers. Word for Windows was presented as the means chosen to process the data. Next, the MLQ was examined for its appropriateness as a coding device and was used as an initial reference point. Inter-coder reliability and analysis based upon a variable-orientated strategy were finally presented to describe the analytical phase of the qualitative aspect of this study. In subsequent chapters, attention will be paid to the results of the main study and the next chapter will start by discussing the quantitative findings.

8

QUANTITATIVE FINDINGS

8.1 INTRODUCTION

In this chapter, the results of the MLQ will be examined to see if the managers from the two specific backgrounds (production and IT/IS), which represent two different kinds of knowledge conversion processes (Socialisation and Combination), can be differentiated in terms of leadership. First of all, attention is directed to reviewing the propositions in the remainder of this introduction. The kind of statistical method used to test the propositions and the corresponding results are then presented and discussed. Limitations are then addressed before the chapter is summarised in the final section.

For the Socialisation process, one proposition was suggested in the literature review: *the Socialisation process depends upon transformational leadership*. Nonaka and Takeuchi's (1995) idea of knowledge conversion processes and their conception of Socialisation is developed in different ways but the choice of production as a basis for the main study is expected to provide insight into the relationship between masters and apprentices. This interaction between masters, as leaders, and apprentices, as followers, is exercised through observation, imitation and practice. The process involves the kind of mentoring in which confidence and competence are installed into apprentices through, for instance, role modelling, counselling and friendship. For this reason, for the purpose of the research design implemented, it is thus suggested that transformational leadership may be of particularly importance.

Regarding the process of Combination, one proposition was suggested: *the Combination process depends upon transactional leadership*. The argument is that in order to develop and implement information systems effectively, transactional leadership may be required because this kind of leadership is short-term, event-centred and concentrates on tactical issues, and only transactional leadership can promote group efficacy that is critical to system development.

The statistical test should therefore reveal differences between the groups, which the Production group adopting transformational leadership to support Socialisation and the information systems group adopting transactional leadership to support Combination. The research design for the main study continued to direct interviewees' attention to the descriptions developed from Nonaka and Takeuchi (1995), and by additionally allocating leaders to groups based upon functional background, differences between the groups should indicate differences between leadership styles as between Socialisation and Combination.

8.2 T-TEST

In this section, one of the most common statistical methods – *t*-test will be presented more fully than in the earlier section dealing with its use in the second pilot study. The reason to present this method at length is that it is one of the two approaches adopted to test the propositions in the main study. So what is the *t*-test? Before answering this question, it is necessary to have a clear understanding of what social science research tries to do. In fact, it can be argued that one of the social science research goals is to accurately measure the levels of different features of the social world. Social science researchers are keen on specifying the level of difference in, for instance, household income or voting behaviour, and how results are varied by where we live, what kind

of job we have and so on. Given that, what is the role of t -test in the social sciences? Simply speaking, the t -test is a kind of statistical method designed to evaluate specific hypotheses about the existence of difference. As Reaves (1992) indicates, the t -test assesses the statistical significance of the difference between two different groups. However, if the number of group being tested is three or more, the method of *analysis of variance* (ANOVA) can be used instead. This is why Hair, Anderson, Tatham and Black (1998) argue that t -test is “a special case of ANOVA” (p. 330).

Sometimes, the t -test is known as the “Student’s t -test” because William Gosset, its creator, wrote about it in his publications not under his own name, but with the pen name “Student” (Blaikie, 2003). Statistically, t is the difference between the means, divided by the estimated standard error of the difference. In other words, the t value stands for the group difference in terms of standard errors (Hair et al., 1998). Siegel and Morgan (1996) suggest that a basic rule of the t -test is the larger the sample size, the smaller the t value, meaning that as long as the sample size grows, precision in “the sample standard deviation as an estimate of the population standard deviation” will be increased (p. 356). There are two kinds of t -test: the one-sample t -test and the two-sample t -test. The former compares the mean of an independent group with a hypothesised population mean, whereas the latter does the comparison between the means of two independent groups (Bernard, 2000; Robson, 2002). Robson (2002) moreover indicates that the two-sample t -test incorporates two approaches: paired and unpaired. No matter which kind of t -test is referred to, all apply to either one-tailed or two-tailed probabilities. One-tailed probability refers to the situation where the investigator is concerned that one is significantly larger or smaller than the other. Two-tailed probability, however, is about confirming that the two parties are significantly different from a particular probability value (Bernard, 2000; Robson,

2002). Siegel and Morgan (1996) recommend that the two-tailed test should be used in most situations.

8.2.1 Results of the *t*-test

There is one assumption of the *t*-test. It is assumed that the variances of the two groups are equal (Barnes and Lewin, 2005). Levene’s test is designed to examine homogeneity of variance across groups. As Levene’s test is based upon the null hypothesis that the two groups’ variances are equal, if the results of Levene’s test are significant ($p < 0.05$), the null hypothesis is rejected. If, however, the results of Levene’s test are not significant ($p > 0.05$), the null hypothesis is accepted and the variances are assumed to be equal (Field, 2005). Table 8.1 summarises the results of Levene’s test for this study. According to the table, most of the results showed no significance ($p > 0.05$). The exceptions were for the transactional scales of CR (Contingent Reward) and LF (Laissez-faire). The results of these two scales showed significantly differences, but these were not reflected in the overall results of TA (Transactional Leadership). Even so, the results of the *t*-test must be subject to caution.

Table 8.2 shows that there are no significant differences between the two groups for overall leadership ($t = -0.748$, $df = 36$, $p > 0.05$), transformational leadership ($t = -1.083$, $df = 38$, $p > 0.05$), transactional leadership ($t = -0.252$, $df = 36$, $p > 0.05$) or any of the individual leadership dimensions ($p > 0.05$). Within the scales of transformational and transactional leadership, IS (Intellectual Stimulation) ($t = 0.000$, $df = 38$, $p > 0.05$) is an unexpected case. As its *t* value is nil, it suggests that there is no difference between the two groups in terms of the mean. This is shown by Table 8.2 as the mean of IS for both groups of Socialisation and Combination is the same

Table 8.1 *Levene's Test of Equality of Variances*

	Levene's Test for Equality of Variances	
	F	Sig.
LEADERHIP	.456	.504
Transformational Leadership	.110	.742
Transactional Leadership	.242	.626
Idealized Influence (Attributed)	.928	.342
Idealized Influence (Behavior)	1.731	.196
Inspirational Motivation	.017	.898
Intellectual Stimulation	.071	.791
Individualized Consideration	.169	.683
Contingent Reward	6.403	.016
Management-by-Exception (Active)	.841	.365
Management-by-Exception (Passive)	4.047	.051
Laissez-faire	5.646	.023

(3.0375). Table 8.3 is exploratory and considers statistical differences between items within the Socialisation and Combination groups. It shows that there exist significant differences between transformational and transactional leadership in terms of the entire samples ($t = 11.256$, $df = 37$, $p < 0.05$), the Socialisation group ($t = 8.027$, $df = 18$, $p < 0.05$) and the Combination group ($t = 7.846$, $df = 18$, $p < 0.05$). This result suggests that overall the managers for both groups see these two kinds of leadership differently and, by implication, that there is no difference between the groups at this level, confirming the results of Table 8.2.

Whilst further examining the results of paired t -test for all transformational and transactional scales, some are worthy of further investigation. Regarding the pairs showing significant differences for the Socialisation group, there are ten (five from transformational leadership and five from transactional leadership), but five (all from transactional leadership) for the Combination group. This suggests differences

Table 8.2 Results of Means, Standard Deviation and t-test (Between Groups)

Overall												Socialisation				Combination				t-test							
N												M ³²		SD		N		M		SD		t		df		2-Tail Sig.	
LEADERSHIP												38	2.4202	0.3816	19	2.3737	0.4061	19	2.4668	0.3603	-0.748	36	0.460				
Transformational												40	2.8375	0.4682	20	2.7575	0.5136	20	2.9175	0.4156	-1.083	38	0.286				
IIA ³³												40	2.7375	0.6479	20	2.6500	0.6091	20	2.8250	0.6887	-0.851	38	0.400				
IIB ³⁴												40	2.8063	0.5951	20	2.7875	0.6653	20	2.8250	0.5325	-0.197	38	0.845				
IM ³⁵												40	2.9250	0.5807	20	2.8125	0.5953	20	3.0375	0.5577	-1.233	38	0.225				
IS ³⁶												40	3.0375	0.4687	20	3.0375	0.4885	20	3.0375	0.4608	0.000	38	1.000				
IC ³⁷												40	2.6813	0.6455	20	2.5000	0.7024	20	2.8625	0.5409	-1.829	38	0.075				
Transactional												38	1.9786	0.4370	19	1.9605	0.4126	19	1.9967	0.4707	-0.252	36	0.802				
CR ³⁸												40	2.9688	0.5286	20	2.9125	0.6349	20	3.0250	0.4047	-0.668	32.253	0.509				
MEA ³⁹												39	2.5769	0.7028	19	2.5263	0.6395	20	2.6250	0.7716	-0.434	37	0.667				
MEP ⁴⁰												40	1.2062	0.5880	20	1.2500	0.4867	20	1.1625	0.6848	0.466	38	0.644				
LF ⁴¹												39	1.1538	0.7015	20	1.1500	0.5584	19	1.1579	0.8425	-0.034	31.039	0.973				

³² Mean scores of 0 is "Not at all", 1 is "Once in a while", 2 is "Sometimes", 3 is "Fairly often" and 4 is "Frequently, if not always".

³³ Idealized Influence (Attributed)

³⁴ Idealized Influence (Behavior)

³⁵ Inspirational Motivation

³⁶ Intellectual Stimulation

³⁷ Individualized Consideration

³⁸ Contingent Reward

³⁹ Management-by-Exception (Active)

⁴⁰ Management-by-Exception (Passive)

⁴¹ Laissez-faire

Table 8.3 Results of Paired t-test (Within Groups)

	Overall				Socialisation				Combination			
	t	df	2-Tail Sig.	t	df	2-Tail Sig.	t	df	2-Tail Sig.	t	df	2-Tail Sig.
Transformational – Transactional												
Transformational	IIA – IIB	39	0.438	-1.124	19	0.275	0.000	19	1.000	7.846	18	0.000
	IIA – IM	39	0.023	-1.412	19	0.174	-1.894	19	0.074			
	IIA – IS	39	0.001	-3.401	19	0.003	-1.945	19	0.067			
	IIA – IC	39	0.591	1.371	19	0.186	-0.212	19	0.834			
	IIB – IM	39	0.158	-0.206	19	0.839	-1.919	19	0.070			
	IIB – IS	39	0.005	-2.266	19	0.035	-1.894	19	0.074			
	IIB – IC	39	0.260	2.467	19	0.023	-0.208	19	0.838			
	IM – IS	39	0.175	-1.739	19	0.098	0.000	19	1.000			
	IM – IC	39	0.023	2.326	19	0.031	1.106	19	0.283			
	IS – IC	39	0.000	4.139	19	0.001	1.487	19	0.153			
Transactional	CR – MEA	38	0.000	3.284	18	0.004	2.592	19	0.018			
	CR – MEP	39	0.000	9.926	19	0.000	9.906	19	0.000			
	CR – LF	38	0.000	8.675	19	0.000	8.616	18	0.000			
	MEA – MEP	38	0.000	10.375	18	0.000	6.908	19	0.000			
	MEA – LF	37	0.000	8.917	18	0.000	6.339	18	0.000			
	MEP – LF	38	0.562	0.847	19	0.408	0.000	18	1.000			

between the groups. Both groups share the same result of significantly different to the pairs of CR-MEA, CR-MEP, CR-LF, MEA-MEP and MEA-LF for transactional leadership but as regards transformational leadership, each group has its own unique set of results. For the Socialisation group, there are differences for the pairs of IIA-IS, IIB-IS, IIB-IC, IM-IC and IS-IC but for the Combination group, none is significantly different. The result of Table 8.3 seems to suggest that it would be worthwhile to investigate further from a more integrated perspective that not only looks at responses in terms of differences in response to individual items as in Table 8.2 but also in terms of differences in the responses based upon relationships between variables.

8.3 MANOVA

Investigating from an integrated perspective means that the interrelationships between variables must be examined. The dependent variables of IIA, IIB, IM, IS and IC (or CR, MEA, MEP and LF) have to be tested collectively as they are the attributes of transformational leadership (or transactional leadership) and there may be differences between the groups of managers at the level of the interrelationships between these items. MANOVA can be used to test this possibility. According to Hair et al. (1998), MANOVA involves multiple variables being analysed in “a single relationship or set of relationships” (p. 2). They argue that in a multivariate situation, something being tested is not a single dependent measure, but a variate that stands for a linear combination of variables. MANOVA is necessary when there are multiple dependent variables, together with one of the following conditions, more than one independent variable or one independent variable with more than two levels (Bernard, 2000; Clark-Carter, 1997). Blaikie (2003) argues that MANOVA is particularly useful in experimental research because it helps the researcher to test “hypotheses

concerning the variance in group responses on two or more metric dependent variables” (Hair et al., 1998, p. 15). Hair et al. moreover indicate that MANOVA is even more powerful than univariate tests in detecting combined differences and providing dimensions of differences when multiple variates are formed. As MANOVA only takes two or more metric-level dependent variables into consideration, it is always seen as an extension of ANOVA (Blaikie, 2003; Clark-Carter, 1997).

8.3.1 Results of the MANOVA

Table 8.4 summarises the results of the MANOVA and it presents three levels of the MANOVA test: leadership as a whole, transformational leadership and transactional leadership. In each level, there are four test statistics: Pillai’s Trace, Wilk’s Lambda, Hotelling’s Trace and Roy’s Largest Root. As these three levels have the same sample sizes, the robust statistics in this case is Pillai’s Trace (Field, 2005). In fact, no matter which one is most robust for this study, as the table reveals, the four statistics under the same level have the same results, except the column of “value”. In terms of significance, Table 8.4 shows that there are no significant differences ($p > 0.05$) for the three levels of overall leadership, transformational leadership and transactional leadership. The meaning of this result is that it shows the knowledge conversion process effect to be insignificant when the various transformational-transactional leadership measures are taken into consideration collectively. As anticipated from the *t*-test, the results for transformational leadership are stronger than those for transactional leadership but the lack of significance can indicate only one conclusion: that if there is a difference between the two groups, it cannot be shown through statistics.

Table 8.4 *Multivariate Tests of Significance*

			Value	<i>F</i>	Hypothesis df	Error Df	Sig.
LEADERSHIP	process	Pillai's Trace	.162	.603	9.000	28.000	.784
		Wilks' Lambda	.838	.603	9.000	28.000	.784
		Hotelling's Trace	.194	.603	9.000	28.000	.784
		Roy's Largest Root	.194	.603	9.000	28.000	.784
Transformational Leadership	process	Pillai's Trace	.140	1.110	5.000	34.000	.373
		Wilks' Lambda	.860	1.110	5.000	34.000	.373
		Hotelling's Trace	.163	1.110	5.000	34.000	.373
		Roy's Largest Root	.163	1.110	5.000	34.000	.373
Transactional Leadership	process	Pillai's Trace	.025	.210	4.000	33.000	.931
		Wilks' Lambda	.975	.210	4.000	33.000	.931
		Hotelling's Trace	.025	.210	4.000	33.000	.931
		Roy's Largest Root	.025	.210	4.000	33.000	.931

8.4 DISCUSSION

For the Socialisation process, it can be seen from Table 8.2 that the overall scores for the transformational scales are generally higher than those for the transactional scales, which are supported by the fact in Table 8.3 that transformational leadership is significantly different ($p < 0.05$) from transactional leadership. The exception is contingent reward, although it may be argued that in the eyes of the managers, transformational leadership was considered to be more important overall than transactional leadership to the process of Socialisation. This result may be argued to confirm the Socialisation proposition, which suggests that *the Socialisation process depends upon transformational leadership*. For the Combination process, it can be seen from Table 8.2 that the score for contingent reward is higher than those for other transactional scales, which is supported by Table 8.3 that contingent reward is significantly different ($p < 0.05$) from management-by-exception (active), management-by-exception (passive) and laissez-faire. However, from Table 8.2, it

seems to be difficult to see that contingent reward would be significantly different from the transformational scales. In this case, although contingent reward is considered as the most significant element of transactional leadership, it is only significantly different from other transactional scales, so it would be inappropriate to support the proposition that *the Combination process depends upon transactional leadership*.

There are other findings for both groups in terms of the appropriateness of particular leadership characteristics. For the Socialisation group, Table 8.2 shows that the score for *contingent reward* is relatively high and even higher than that given for some transformational scales. The message sent by the managers could be that *contingent reward*, which is an essential component of transactional leadership, is as important as transformational leadership to the Socialisation process. On the other hand, for the Combination group, the result shows that transformational leadership may also be important. Table 8.2 shows that the scores of the transformational scales are relatively high from 2.8250 to 3.0375, which means that the managers to some extent believe that the transformational leadership characteristics are also required for the Combination process. The commonality of the Socialisation and Combination groups seems to be that in terms of transactional leadership, managers considered contingent reward as an important factor. This finding is consistent with the existing literature in that contingent reward has always been an important characteristic. This consistency makes the study important because it confirms the reliability of this study. The ways in which contingent reward is important to the groups will be discussed in subsequent chapters.

The above finding suggests that there exists a gap between the propositions and the

findings. As mentioned earlier, the propositions suggest that the Socialisation process requires transformational leadership and the Combination process involves transactional leadership. Yet, the findings suggest that the Socialisation process requires not only transformational leadership but also contingent reward and the Combination process involves not only transactional leadership but also transformational leadership. Although this gap could make a contribution to knowledge, in that the Socialisation process may also require transactional leadership and the Combination process may also need transformational leadership, the main point is that the statistical analysis has failed to show any differences between the Socialisation and Combination groups. The finding that leadership does not appear to be contingent coincides with the first pilot study and the findings in the leadership literature that suggest that the transformational and transactional leadership framework has universal relevance. This finding may imply a rejection of all propositions. However, differences in leadership for different types of knowledge conversion processes may not be found at the quantitative level. If such a difference is to be discovered, the qualitative study may provide insights which are not available from the quantitative study and this possibility is explored later.

8.4.1 Limitations

The major limitation in this study is concerned with the number of participants involved. From the point of view of quantitative research, the total number of forty participants (twenty for each group) is relatively small. A larger sample may have been capable of producing better results and yet has its own drawbacks. As triangulation is a principal strategy within this study, those participants who completed questionnaires were also invited to be interviewed. From the point of view of qualitative research, forty participants produce a huge quantity of data, which

presents its own challenge so far as analysis is concerned. So on the one hand, the strategy of triangulation is an essential characteristic of this study, but on the other hand, it brings a limitation to this study. This limitation may be overcome by future studies which develop larger sample sizes. In the case of the present study, it appears that supporting differences in leadership style for knowledge conversion processes is not sustainable at the level of quantitative analysis.

8.5 SUMMARY

This chapter discussed the quantitative results of the main study. It started by reviewing relevant propositions considered in this study. Next, the chapter introduced the statistical method of the *t*-test which was used to test the propositions. The results showed that the two groups of managers revealed no significant differences in terms of leadership. Analysis using MANOVA supported the finding that the two groups' attitudes towards leadership revealed no difference. Attention was then paid to discussing the extent to which the propositions were confirmed and the appropriate leadership styles for both processes of Socialisation and Combination. This chapter also mentioned the limitation of this study in relation to the small sample size. It seems that qualitative evidence will be needed if the propositions are to be supported. Given this, the next chapter will start to view this study from a qualitative perspective, beginning with consideration of transformational leadership.

9

QUALITATIVE FINDINGS I – TF LEADERSHIP

9.1 INTRODUCTION

This chapter presents the interviewees' opinions about Socialisation and Combination from the point of view of transformational leadership. The conclusions drawn from the analysis are twofold: for most dimensions, the two groups are similar, but for some detailed aspects of transformational leadership, they are not. This chapter thus confirms the finding of the quantitative analysis and rejects the proposition that different knowledge conversion processes can be associated with different leadership styles, except in very specific aspects of transformational leadership. This chapter begins by examining idealized influence – the first element of transformational leadership. Attention is then turned to the perspective of inspirational motivation. After that, the managers' opinions about individualized consideration are discussed. A dimension of intellectual stimulation is included in this section because the point raised by interviewees is relevant to personal development, which is a facet of individualized consideration. Finally, other aspects of transformational leadership are taken into consideration. These elements do not belong to any of the transformational scales represented by the MLQ but are related to more general aspects of transformational leadership. The phrase "pan-transformational leadership" is used to categorise these elements of the interviewees' responses.

Each section begins by rehearsing material from the literature which is relevant to the qualitative data analysis. Sections then draw upon interview data in order to assess the extent to which the Socialisation and Combination groups are similar or different in their approaches to knowledge conversion.

9.2 IDEALIZED INFLUENCE

Bass (1999) argues that idealized influence can be conceived as a substitute for the term charisma, and this study is in line with studies which use the terms idealized influence and charisma interchangeably (Conger, 1999; Judge and Piccolo, 2004; Rafferty and Griffin, 2004). Idealized influence and charisma involve a wide range of characteristics. First of all, when leaders apply idealized influence, they tend to influence their followers by providing role models. Conger (1999) argues that role modelling is one of the characteristics of charismatic leadership. Equally, idealized influence involves “setting a personal example” (Kark, Shamir and Chen, 2003, p. 247), and leaders who exercise idealized influence act in ways that “allow them to serve as role models for their followers” (Bass and Riggio, 2006, p. 6). Being role models, leaders gain trust, respect and admiration from their followers (Conger, 1999; Stone, Russell and Patterson, 2004). Leaders are trusted, respected and admired because they show extraordinary capabilities, persistence and determination in their abilities to do the right thing (Bass and Riggio, 2006; Kelloway and Barling, 2000). In addition to engendering trust and respect, leaders may also instil their values and beliefs so as to influence the mindset of followers. This is because role modelling involves a process by which “followers mold their beliefs, feelings, and behavior according to those of the leader” (Kark et al., 2003, p. 247).

According to Bass (1985), leaders who achieve idealized influence make use of

“metaphor, symbolism, ceremonial, and insignia as ways of concretizing and transmitting their visions of what could be and committing their organizations to them” (p. 45). They are capable of arousing and articulating the followers’ needs, values and hopes. In other words, they have insight into what their people really want and they do this through “dramatic and persuasive words and actions” (p. 46). Being able to capture followers’ hearts and minds can thus be seen as another characteristic of charismatic leaders. Such leaders may also convey a sense of confidence, purpose and power because they are characterised by strong self-confidence, transcendental purposes and extraordinary determination, power and capability (Bass, 1985).

9.2.1 Similarities between the two groups

It can be seen from Appendix H that both groups of managers talked about being role models, trusting, capturing subordinates’ hearts and minds; and having a strong sense of power.

First of all, managers mentioned the importance of being role models. Manager C-020 argued that “... *for employees to combine explicit knowledge ... (managers) have to set a good example with their own conduct*”. Likewise, Manager S-008 claimed that “*it becomes much like ... setting a good example with your own conduct*”. The reason for being a role model is that where managers “*take things seriously, their subordinates will take things seriously as well*” (Manager C-016). This argument was supported at a more general level by Manager S-004, who explained that “*the whole team will follow in your steps*”.

In addition to being role models, the Socialisation and Combination managers’ comments also showed no difference from the perspective of trust. For instance,

Manager S-006 suggested that managers must show that they “*can be trusted*”. Manager C-010 mentioned that trust was important to both Socialisation and Combination. He said that regarding the production line in particular, “*the trust between group leaders and groups members will be very important*”. He further suggested that trust allows subordinates to feel more comfortable, and therefore encourages participation, including the participation that is necessary to “*combining knowledge*”. Equally important, Manager C-019 revealed the possible consequences of trusting subordinates. He argued that if leaders trust followers, “*they will do anything for you ... (and) work for you to death*”. To sum up, the managers agreed that trust was of the essence to Socialisation and Combination.

Both groups of managers talked about capturing subordinates’ hearts and minds. Managers S-008, C-014 and C-019 suggested that if you want to lead your people, you have to “*lead their hearts and minds*”. Manager S-008 further suggested that “*this is not about their know-how; this is about their hearts and minds ... identification and attitudes are all about hearts and minds*”. The point made by Manager S-008 supports the argument that it is charismatic or transformational leadership who creates followers’ personal identification with the leader (Hater and Bass, 1988; Kark et al., 2003; Pawar and Eastman, 1997).

The managers believed that displaying a sense of power and confidence was an important way of influencing subordinates. For instance, Manager S-015 revealed her determination and self-confidence by showing her followers that “*though I am a female, I know everything and I am capable of doing everything*”. Manager C-009 also argued that leaders have to display a sense of power where necessary. He said that if there is a situation where decisions have to be made, leaders need to stand up

and say that *“however good or bad, whether the decision is right or wrong, this is the way we have to go”*. The same argument was made by Manager S-003 who stated that *“as a manager, you have to group your people together and make them head in the same direction”*. Taken together, there seemed little difference between the two groups in their use of power to influence followers.

9.2.2 Areas where opinions differed

Having discussed facets of idealized influence where the groups were similar in their approaches to knowledge conversion, attention is now turned to the differences between the two groups. Differences were evident where only one group made comments on particular facets. For instance, in relation to the importance of a strong sense of purpose, only managers from the Combination group provided comments. Manager C-012 said that *“I will tell them to understand deeply what they are doing ... (and) the future purpose of their activities”*. Manager C-018 suggested that *“you have to let them see the underlying reason for doing something”*. It can be argued that the reason for Combination managers to stress purpose is due to the role of development in their activities. Manager C-011 suggested that *“our job is to develop the systems for the convenience store, (and) we have to realise why we need to develop the particular systems”*. In this case, he had to *“let (the subordinates) know what the project they are doing is all about”*. A sense of purpose thus seems to be related to the aspect of Combination which is concerned with development.

The Socialisation group of managers did not specify the importance of having a strong sense of purpose. According to Nonaka and Takeuchi (1995), the key to Socialisation is experience. With some forms of shared experience, individuals' tacit knowledge is reoriented. Nonaka and Takeuchi argue that Socialisation takes place in

a harmonious atmosphere where shared mental models are acquired through observation, imitation and practice. In this case, the process of Socialisation may not involve a strong sense of purpose. This is because from the point of view of Nonaka and Takeuchi, shared mental models can be called “sympathized knowledge” (p. 71) and it can be argued that sympathized knowledge may not be purpose-oriented. It therefore seems reasonable to argue that a sense of purpose is necessary to the development aspect of Combination but is not essential to the experiential nature of Socialisation. Sense of purpose is the first element of leadership encountered in this study where we might find a difference in leadership for knowledge conversion. This difference can therefore be shown to arise theoretically as a contrast between socialisation and combination. It suggests validity of the study as a comparison and contrast of socialisation and combination, as opposed to a study of production and IT/IS.

9.3 INSPIRATIONAL MOTIVATION

According to Bass (1985), inspirational motivation involves emotional stimulation and it is a kind of leadership that “employs or adds nonintellectual, emotional qualities to the influence process”. In brief, inspirational motivation appeals to “sensation and intuition” (pp. 63-64). Inspirational leaders encourage their followers to achieve results beyond their expectations (Kelloway and Barling, 2000). Leaders do so by “providing meaning and challenge to their followers’ work” (Bass and Riggio, 2006, p. 6). Inspirational leaders motivate followers by creating and presenting an attractive future vision (Kark et al., 2003). Through inspirational leaders, the spirit of the team is enhanced because enthusiasm and optimism are demonstrated (Bass and Riggio, 2006; Kark et al., 2003; Stone et al., 2004). Leaders set higher standards and display commitment to the achievable goals of the future

(Walumbwa and Lawler, 2003).

Inspirational leaders build relationships with followers through an open organisational climate or culture (Bass, 1985). One of the outcomes is the extra effort shown by followers (Densten, 2002). Bass (1985) provides a reason why hard-working followers are associated with inspirational leaders. He argues that if those who are in the world of work know that they are serving “the best company with the best products and resources”, they are “most likely to be committed, involved, loyal, and ready to exert extra effort” (p. 70).

It seems that inspirational leadership may involve behaviours like articulating a compelling vision of the future and creating a particular kind of organisational culture, and these were the behaviours appeared on the managers of this study.

9.3.1 Similarities between the two groups

The Socialisation and Combination managers' comments from the perspective of inspirational motivation are shown as Appendix I. In this section, attention will be paid to the two groups' common perceptions.

Both Socialisation and Combination groups of managers believed that it is important to create an internal culture. This is probably because, from their point of view, as long as subordinates are part of a positive culture, they can be inspired, and in consequence this may bring benefits in terms of the processes of Socialisation and Combination. Managers S-001 and S-007 argued that an “*open*” culture must be created. In the eyes of Manager C-006, the atmosphere in the Computer Division is “*very free ... in terms of time (and) social class*”. Manager C-007 suggested that

managers have to “*create a competitive culture (in which) ... they can make progress, have a future and increase their skills*”. From the point of view of Manager C-014, managers should “*let a unit generate some kind of so-called positive competition (culture)*”.

In addition to free, open and competitive cultures, both groups of managers also advocated creating an internal atmosphere where everyone can experience safety and stability. As indicated by Manager C-016, leadership is about creating “*an internal environment in which there are no intrigues*”. Manager C-011 argued that “*especially for young people nowadays, they ... care much about whether this work can make them feel more comfortable*”. Likewise, Manager S-014 asserted that the company has to provide subordinates with a culture in which they can “*have the feeling of stability ... (and) have no fear of disturbance*”. This point is supported by Nonaka et al. (2000) who argue that to manage the dynamic knowledge creation process, it is important for leaders to create “an atmosphere in which organisation members feel safe sharing their knowledge” (p. 28).

9.3.2 Areas where opinions differed

Based upon the importance of creating an appropriate culture, the Combination managers indicated the necessity for a compelling vision of the future. This seems to be a genuine difference between the two groups and appears to be related to a sense of purpose. Manager C-014 suggested that managers have to “*let subordinates feel that if they work in this place, they can be challenged and enjoy a good future*”. In his opinion, leaders have to give their followers “*not only schedules, but also hope*”. Manager C-013 said that “*you have to let them know that the company is not only involved in what we are currently doing, but will also achieve something someday*”,

meaning that leaders should tell followers that *"the company will promote a better world"*. From the perspective of Manager C-007, promising subordinates a bright future is *"more important than giving them high pay or good welfare"*. Manager C-010 believed that once subordinates *"have some idea and feelings about the vision ... subsequent mission statements, strategies, procedures and actions can be identified by them and can be conducted smoothly"*.

The need to have a compelling vision of the future is hard to apply to the Socialisation group. The reason is similar to their neglect of a sense of purpose. As Socialisation usually concerns building a harmonious atmosphere where everyone can share their experiences and mental models, those who are involved may feel interested only in *"project(ing) her- or himself into another individual's thinking process"* (Nonaka and Takeuchi, 1995, p. 63). In this case, it can be understood that they are not interested in knowing what the future might be because caring much about the future may give them no help in acquiring mental models. So, it seems that a vision of the future is essential to Combination but is not necessary to Socialisation. Vision of the future is the second element of leadership came across in this study where there might be a difference in leadership for knowledge conversion.

A necessary aspect of vision is the need for long-termism. Manager C-009 suggested that leaders have to *"look far, not look near"*. He said that *"as a leader, you have to see things which may take place after five or ten years"*. Similarly, Manager C-019 revealed that *"I usually look at things further into the future"*. Manager C-012 stated that *"I sometimes stimulate my team to act in the long-term"*. It can be argued that one reason for these managers to consider things from the long-term perspective is that the Combination process usually involves development work. As argued by

Nonaka and Takeuchi (1995), this process is about combining “newly created knowledge and existing knowledge ... into a new product, service, or managerial system” (p. 71). So, according to Manager C-009, “*you have to think deeply ... you have to rely on situations five years ahead to make decisions*”. The idea of long-termism was also taken into account in relation to the Socialisation group, but its rationale was different from that of the Combination group. Manager S-008 argued that “*if you want to experience this process and gain something from it, long-term and continuous implementation is required. Without long-term and continuous implementation, I think it becomes temporary and meaningless*”. Thus, it can be argued that for Socialisation, continuous improvement in the long-term is a means, but for Combination, long-termism as a vision of the future is a goal.

To sum up, the Socialisation group differs from the Combination group in relation to vision and long-termism. The above argument of Manager S-008 seems to explain why the Socialisation group only takes long-termism into consideration. They realise that if they want to see any effect, a certain period of time has to be taken because what they are doing involve a never-ending process (Nonaka and Takeuchi, 1995). In this case, from the Socialisation group’s point of view, long-termism is only a general concept that acts as a condition for the Socialisation process to be successful, and it has nothing to do with whether the process needs a vision in order to be successful. The situation is different for the Combination group. Since they produce new results by combining different kinds of explicit knowledge, a farseeing vision is thus required as it can be used to describe what the new results should look like. So, for the Combination group, long-termism and vision are a reflection of the Combination process. Similar to sense of purpose, this dimension supports validity of the study as a comparison between socialisation and combination, rather than between production

and IT/IS.

9.4 INDIVIDUALIZED CONSIDERATION

Leaders with the characteristic of individualized consideration not only satisfy each follower's unique concerns and needs but also show genuine support for the follower (Judge and Piccolo, 2004; Lievens et al., 1997; Rafferty and Griffin, 2004). According to Barling, Weber and Kelloway (1996), individualized consideration is about developing and coaching. Similarly, Bass, Avolio, Jung and Berson (2003), Judge and Piccolo (2004) and Yukl (1999a) argue that leaders with individualized consideration act as coaches or mentors to the followers. The idea of development is of the essence to individualized consideration. As indicated by Avolio and Bass (1995), the issue of development has occupied a large portion of the literature of individualized consideration.

Alongside development, the second major aspect of individualized consideration of relevance to the data is concerned with supporting followers. Bass (1985) calls this dimension individualized orientation. Leaders who display individualized orientation are "friendly, helpful, considerate, and appreciative of individual subordinates" (Yukl, 1999a, p. 288). Bass (1985) argues that this is a kind of behaviour that pays attention to advocating familiarity and personal counselling. Face-to-face interaction is essential to this dimension. Rafferty and Griffin (2004) use the term *supportive leadership* to describe leaders who display individualized consideration.

Interviewees' comments on developing and supporting followers are showed as Appendix J.

9.4.1 Similarities between the two groups

Both groups of managers stressed the necessity of supporting followers by considering an individual as having different needs, abilities, and aspirations from others. They believed that leadership must depend upon respecting individual difference. As Manager C-005 suggested, there are *“many kinds of people ... (and) we ... have different ways of managing them. It depends on people”*. This statement was echoed by Manager S-009 who said that *“my experience is that it has to depend upon the people you are leading”*. This is because *“everyone has different backgrounds ... thoughts ... (and) requirements”* (Manager C-009). In order to treat subordinates differently, the managers argued that it is necessary to explore individual's requirements. Manager S-005 suggested that *“if you want to lead the employees in a company, you have to consider what they really want”*. Likewise, Manager C-010 indicated that *“you have to spend time understanding what each of your members wants”* because *“after knowing what they want, you then can determine the kind of action that should be taken”*. He suggested that you can *“observe them ... get along with them (or) sense what they really want from their behaviour”*.

Manager S-005 argued that *“for some people, you have to pay much attention to them; for some people, you have to keep on explaining to them until they totally understand what they are asked to do; for some people, you really have to be strict; for some people, they only need your care”*. Similarly, Manager S-010 said that some people just *“do not like to talk about production. In this case, you have to ask about their families, their children ... when they hear you asking this, they will be in a good mood”*. From the point of view of Manager C-013, everyone is different; *“some want money, some want stability and some want a bright future and so on”*. So, as

Manager C-019 suggested, *“you have to assign someone to do things which are consistent with their characters. If so, they will be responsible for themselves”*. In a similar vein, Manager S-008 argued that *“people have to be treated individually. Being treated individually, and allocated the right responsibilities, they will enjoy their work”*.

Both groups of managers also talked about caring or treating their subordinates as families. Basically, they believed that managers are responsible for taking good care of their subordinates. Manager S-005 made it clear that *“if you want to lead these people, you certainly have to be concerned about them”*. Manager C-019’s comment was to the effect that *“I am in charge of taking care of them”*. The managers even treated their subordinates as friends or brothers/sisters or cared about their subordinates’ families. Manager C-005 suggested that *“when I am off duty ... I am their friend ... In my opinion, I treat them as my brothers”*. Likewise, Manager C-012 argued that *“I do not see my people as my subordinates; I see them as my brothers and sisters”*. He even cared about subordinates’ families and *“when their husbands/wives or children were ill, I asked them whether they needed any help”*. Manager S-005 suggested that *“it would be better if you can also be concerned about their families”*. This is because *“if you do that, they will do anything for you”* (Manager C-012).

Managers talked about respecting subordinates. Showing respect for someone can be seen as a way of supporting them because it involves accepting them for who they are. Manager S-004 suggested that *“you have to respect other people”*. Manager C-018 argued that *“besides salary, people also need respect. You cannot just give them salary and then tell them to do what you want them to do”*. This may be

especially true for those who work in the information department, *“some have Masters or even PhD degrees ... (and) their quality is quite high and their autonomy is quite strong, (so) you have to respect them”* (Manager C-015).

Following from the earlier comments about culture, managers supported their subordinates by providing time and space to do things. Manager S-004 said that *“I will give my people space, rather than ask them to follow my way of doing things”*. Manager S-010 argued that he would *“give them space to develop”*. Manager C-019 made it clear that *“to manage R&D and IT staff, I will manage them by giving more space”*. For this kind of staff in particular, the way to provide more space was to give them *“double the time necessary to do what they ought to do”* (Manager C-005). Manager C-019 indicated that the reason for this kind of support is about *“drawing upon something in their minds; you cannot give them too many regulations ... (or) set up rules to tell them what they have to do”*.

Developing subordinates' strengths provides the second area of interest. The most common way to provide development was through training or teaching. Manager S-006 said that *“you have to use training and education to make them believe that their techniques or skills cannot last forever”*. Manager S-012 believed that only through on-site training, *“techniques can be transferred directly”*. From the managers' perspective, training was a means to an end. As Manager S-016 indicated, *“you have to use training to let them accept this kind of idea”*. Manager C-004 argued that *“in the beginning, they may not have any idea of what is going on. So we provide them with some training and assign someone to teach them, giving them time to learn”*. Manager C-013 suggested that you just *“have to give them complete training programmes to let them grow”*. Manager C-003 even created a special

opportunity for training abroad; *“some are offered this opportunity every year but some are not”*.

For both groups of managers, a second way to develop subordinates' strengths was to encourage them to seek different perspectives when solving problems. Although this behaviour is one of the characteristics of intellectual stimulation, its purpose also supports the widening of followers' viewpoints. In other words, its purpose is to develop followers' strengths. As argued by Bass (1985), transformational leaders' intellectual stimulation is defined as “the arousal and change in followers of problem awareness and problem solving, of thought and imagination, and of beliefs and values” (p. 99). Manager C-009 suggested that *“if you are to manage people, you have to let them understand that while doing one thing there is not just one way of doing it”*. Likewise, Manager S-002 argued that *“there is not just one way of doing things”*. For Manager C-013, one of the leader's jobs was to *“force them to think ... (to) remind them something that they have not thought of”*. From the point of view of Manager C-018, it was about to *“make them consider more”*.

The third aspect of development relates to apprenticeship. As apprenticeship was used to help subordinates to grow, it relates to the development dimension of individualized consideration. Manager S-014 argued that *“there must be apprenticeship ... No matter how powerful the machine tool is, you still need that system of knowledge transfer”*. Likewise, Manager C-004 emphasised that *“we still have the notion of masters leading apprentices ... we have this kind of system as many things cannot be learned by instant training”*. For Manager C-011, he preferred to use *“apprenticeship to lead them to do projects and to impart skill and knowledge”*. This was the case especially for newcomers. As Manager S-010 mentioned, *“we will*

assign experienced masters to guide (newcomers)". Similarly, Manager C-019 said that *"when someone is new here, they will be unable to get on well. I have to let masters guide them"*. Manager C-016 indicated that a reason for apprenticeship is that, *"if you want to do something and you do not understand its cause and effect, you will be wasting a lot of time"*. That is why *"apprenticeship becomes very important"*.

The implication that apprenticeship is important not only for the Socialisation group but also for the Combination group supports the argument "organizational knowledge creation is a continuous and dynamic interaction between tacit and explicit knowledge (and) this interaction is shaped by shifts between different modes of knowledge conversion" (Nonaka and Takeuchi, 1995, p. 70). Combination involves not only explicit knowledge but also tacit knowledge. As argued by Manager C-010, explicit to explicit knowledge conversion relies upon a context within which there is an *"unspoken consensus between the leader and his/her team"*. Manager C-005 indicated that *"most of the time, it has to rely on the accumulation of experience to support judgements ... For instance, we have to use experience to judge when something can be done or to assess progress ... Mostly, tacit knowledge is necessary to judgement"*. Tacit knowledge thus has an effect on the Combination process and so does apprenticeship. This is because it is the way to learn the experience of how and when to combine explicit knowledge. This finding makes a contribution to the literature in the sense that apprenticeship is thus not only central to Socialisation (Nonaka and Takeuchi, 1995), it also has a supporting role in Combination.

9.5 PAN-TRANSFORMATIONAL LEADERSHIP

The term *pan-transformational leadership* is used to embrace leadership behaviour

which is not categorised into the scales of idealized influence, inspirational motivation, intellectual stimulation and individualized consideration but is necessary to the general concept of transformational leadership. For instance, empowerment has been consistently mentioned in the transformational leadership literature, and yet empowering behaviours such as “consulting, delegating, and sharing of sensitive information” are not directly included in the MLQ (Yukl, 1999a, p. 290). In this section, two kinds of pan-transformational leadership behaviour are considered: empowering subordinates and promoting a sense of achievement.

Transformational leaders increase followers’ level of concerns for achievement (Bass, 1999). Transformational leaders re-orientate followers from “concerns for existence to concerns for achievement (Yammarino and Dubinsky, 1994, p. 790). Moreover, Popper and Mayseless (2003) compare transformational leaders with “good” parents and argue that they promote achievement orientation.

Empowerment of followers is an essential characteristic of transformational leadership (Dvir et al., 2002; Kark et al., 2003). Empowerment results from transformational leadership because transformational leaders promote followers’ autonomy and independence (Kark et al., 2003; Popper and Mayseless, 2003).

9.5.1 Similarities between the two groups

The managers talked about empowerment. They believed that sometimes it is necessary to empower someone to be in charge and to take responsibility. For Manager S-010, team leaders, in particular, should be empowered. He said that “*I will empower the team leaders. Let them determine who is more flexible. If someone is more flexible, they can learn more techniques*”. In addition to empowering team

leaders to make personnel decisions, Manager S-010 also empowered the team leaders financially. He indicated that *"we have budgets in the factory. I will let team leaders exercise discretion with small amounts of money without reporting to me"*. He further argued that *"I empower the team leaders and make them responsible ... I will tell my team leaders that as you have been empowered, you can make the best of your resources. I have given my power to you"*. For Manager C-012, empowerment was exercised under limited conditions. He said that *"if the system required is small and does not need my participation, I will assign someone to be in charge of it"*.

9.5.2 Areas where opinions differed

Only Combination managers talked about promoting a sense of achievement. Manager C-012 suggested that you have to *"let them have a sense of achievement"*. Likewise, Manager C-007 indicated that *"the biggest characteristic of managing IT staff is that you have to let them have a sense of achievement ... for those engineers, they want to have a sense of achievement"*. He further argued that the subordinates' definition of happiness is *"not about paying them so much money or allowing them time off from work ... (but about) letting them have a sense of achievement in their work"*.

To explain why a sense of achievement was not promoted by Socialisation managers, attention must be directed to the context of their work. By and large, their work is ruled by standard operating procedures (SOPs). Manager S-008 said that in production departments, *"everyone has to follow SOPs"*. Likewise, Manager S-016 indicated that *"operators' work is very simple and it is about implementation in accordance with the SOP ... (because) production is all about conducting SOPs well"*. In this case, managers may not feel that their people are likely to gain much

sense of achievement in this context. Sense of achievement is therefore unlikely to define a difference in terms of leadership for Socialisation compared with Combination. So, although there was a difference between the groups, that difference derives from context and does not appear to be related to inherent differences between Socialisation and Combination. This difference may not be appropriate to the propositions, but it arises from the tendency of managers to sometimes discuss their experiences whilst at other times devoting attention to the part of the research instrument describing Socialisation and Combination. As a consequence, this difference does not relate to the research question and will not be pursued further.

9.6 SUMMARY

This chapter outlines the managers' comments on Socialisation and Combination from the perspectives of idealized influence, inspirational motivation, individualized consideration and pan-transformational leadership. The results show that differences between the two groups are based upon two levels: a contextual level and a knowledge conversion level. At the level of context, the groups differed in terms of a sense of achievement. It has been argued that the Socialisation managers did not discuss this issue because they were involved in a context where everyone has to follow rules. The context for the Combination managers, in contrast, was one in which a sense of achievement was important. At the level of knowledge conversion, differences between the two groups centred upon a strong sense of purpose and a compelling vision of the future. Socialisation managers did not identify the necessity of having a strong sense of purpose because shared experience generated by Socialisation process may not have a strong purpose orientation. As to a compelling vision of future, it seems difficult to apply to the Socialisation group because those who are involved may only be interested in knack sharing. The Socialisation group

differed from the Combination group in another dimension of vision – need for long-termism. Both groups of managers made comments on this issue, but they were based upon different reasoning. These differences will be discussed further in the final chapter.

From the perspective of transformational leadership as a whole, the qualitative findings support the quantitative findings (Chapter 6) that there was no obvious difference between the groups of Socialisation and Combination. The differences were at the level of particular dimensions which could not be measured through the MLQ either because the MLQ does not provide a basis for measurement (the pan-transformational dimension of a sense of achievement) or because qualitative research provides a level of richness which cannot be captured in other ways (the dimensions of a strong sense of purpose and long-termism) or because the difference could be measured but the nature of the difference is qualitative (a compelling vision of the future). The qualitative findings also support the quantitative findings in revealing the importance of transformational leadership to both Socialisation and Combination. The qualitative findings confirm that transformational leadership is important whatever the situation (Bass and Riggio, 2006). In terms of the propositions, the qualitative findings confirm that the Socialisation process depends upon transformational leadership. However, transformational leadership is also important to the Combination process and it is now clear that the Combination process does not rely solely upon transactional leadership, contrary to the proposition. In the next chapter, attention will be turned to the perspective of transactional leadership.

10

QUALITATIVE FINDINGS II – TA LEADERSHIP

10.1 INTRODUCTION

This chapter presents interviewees' comments about Socialisation and Combination from the perspective of transactional leadership. Its conclusions are twofold and consistent with the previous chapter: the two groups were similar on most dimensions, but some detailed facets of transactional leadership require commentary regarding differences. This chapter also confirms the quantitative findings and so rejects the propositions that different knowledge conversion processes require different leadership styles, except in very specific elements.

The chapter starts by examining contingent reward – the first and most important element of transactional leadership in terms of the quantitative findings. Attention is then turned to the interviewees' comments about management-by-exception. Finally, other dimensions of transactional leadership are discussed. As these dimensions do not belong to any of the transactional scales, but are consistent with the principles of transactional leadership, they are grouped into the heading of pan-transactional leadership. As in the previous chapter, each section of this chapter begins by reviewing the literature which is relevant to the qualitative data analysis. Based upon the interview data, sections then assess the extent to which the two groups were similar or different in their approaches to knowledge conversion.

10.2 CONTINGENT REWARD

Contingent reward supports constructive transactions in which followers seek to attain the agreed-upon, expected performance levels, and their relationships with leaders are short-term, exchange-based and contractual (Bass and Avolio, 1993; Den Hartog et al., 1997; Yammarino et al., 1998). In general, leaders provide two kinds of contingent reward: one is explicit and substantial, and includes wages, bonuses and promotion, and the other is implicit and emotional, and includes prestige, recognition and praise (Bass, 1985; Bass and Steidlmeier, 1999; Den Hartog et al., 1997; Howell and Avolio, 1993; Kahai et al., 2003). Explicit reward can be argued to be more controlling because it is instrumental, whilst implicit reward is more informational because it allows followers to feel more competent and self-determining (Deci, 1975; Deci, Connell and Ryan, 1989; Gagné and Deci, 2005). An alternative view defines these two kinds of contingent reward as two levels of transaction (Kuhnert and Lewis, 1987). Explicit or tangible reward belongs to the low-quality level of transaction and implicit or intangible reward is categorised as the high-quality level of transaction.

Contingent reward can be an effective reinforcer of subordinate's commitment (Yammarino et al., 1998). At least for some groups of subordinates, contingent reward is a kind of stimulation (Avolio and Bass, 1988). In this regard, Bass (1985, 1990) argues that contingent reward is the major element of transactional leadership. This argument is echoed by Judge and Piccolo (2004) who claim that of the transactional leadership characteristics, contingent reward is "the most effective" (p. 757).

In addition to providing rewards, leaders also transact with followers by punishing them (Lievens et al., 1997). Bass (1985) calls this behaviour contingent punishment

or contingent penalisation. He argues that contingent penalisation may take several forms, including “fines, suspension without pay, loss of leader support, or discharge” (p. 122). Avolio and Bass (1995) regard this punishment as another kind of contingent reinforcement. They state that when this contingent reinforcement is exercised, it means that followers are “corrected, threatened, or disciplined by the leader” because they fail to “meet a specific standard of performance delineated by the leader” (p. 202).

10.2.1 Similarities between the two groups

Both groups of managers talked about rewarding subordinates. Manager S-003 revealed that he would “*provide them with some rewards ... (only if) all working stations are performed well*”. Likewise, Manager C-002 stated that he would reward his followers “*as long as they dedicate themselves to work and succeed in every single achievement*”. Manager C-012 made it clear that “*when a project was finished, I would reward my people ... (and if) that project was accepted by the government and then was introduced into other counties, I would reward my people again*”. Money or bonus proved to be a popular form of reward. Manager S-005 said that “*if they are doing extremely well, perhaps the company will give them additional bonuses*”. Manager C-012 simply believed that “*bonuses are needed*”. Manager C-018 was clear that “*the incentive I can offer to them is taking their performance as an indicator for ... adjustment in salary*”. The reason why money is the most popular form of reward in the eyes of the managers is that “*human beings always love wealth*” (Manager S-018). Manager C-009 explained it more practically. He said that “*cash or increase in salary ... is a much more reasonable and practical way ... (because) human being just lives for money*”.

In addition to monetary reward, promotion was another form of reward for the subordinates. Manager S-013 revealed that *“if you are doing good, performing well, you will be getting promoted”*. Manager S-018 suggested that *“besides rewarding them, you can also promote them”*. More specifically, Manager C-001 argued that *“if the employees are very good at so-called explicit knowledge ... they certainly will have more opportunities to get promoted since they can be regarded as good employees of the company”*. Similarly, Manager C-018 said that if the subordinates do *“what they are asked to do, we ... would put them in a good position to secure promotion”*.

In addition to rewarding, the managers on the other hand talked about punishing subordinates. As Manager S-001 revealed, *“if ... things always go wrong, they may need to get punished”*. There were different levels of punishment. The lowest one referred to a verbal warning. Manager S-001 said that *“if their performance is not good at all, I will give them appropriate warnings”*. From the perspective of Manager S-010, reprimanding subordinates was *“the way to keep them moving on”*. Manager C-007 stated that *“if there is something wrong with their processes or something wrong happens to them, there must be warnings or something coming out”*. There was a higher level of punishment that involved taking real action to transfer subordinates to lower or unimportant positions. Manager S-020 argued that for those who are not performing well, *“they may need to do some basic work”*. Manager C-001 made it clear that *“all I can do is to transfer ... those who perform badly to less important positions”*. For Manager C-002, he would let the subordinates with bad performance do some *“routine jobs”*. Some managers even mentioned dismissing subordinates as the highest level of punishment. Manager S-008 said that *“if you are so passive and bad at performance, it is time for you to leave”*. Likewise,

Manager C-019 argued that *"they have to be responsible for what I assign to them. If they do not achieve it, I may get rid of them next year"*.

10.2.2 Areas where opinions differed

The two groups were different in terms of reward variety. Socialisation managers tended to emphasise tangible, explicit, instrumental and low-quality rewards, including increasing subordinates' salaries, bonuses or promotion. Combination managers considered a broader variety of reward. This is probably because as Manager S-009 argued, line workers *"only work for money"* but engineers *"certainly want more"*. Long working time was one reason for the Combination managers to consider a wide variety of reward. Manager C-002 revealed that *"for those who are doing IT work like us, we usually work until late night on weekdays and weekends"*. He further said that *"if you really want to judge our work by money ... it will not generate any effect for us. If you really do that, to a certain extent we will regard it as compensation rather than stimulation"*. Given that, managers would rather use some other ways to support subordinates. Manager C-005 used food to reward his people. He said that *"if they have to overtime on Saturday, Sunday, usually I will buy them a meal"*.

Another reason to make Combination managers consider variety in terms of reward was the context in which they operated. Manager C-014 gave a clear description of what would be confronted by those who are in an IT industry. He indicated that *"if you are in such industry and are one of those who do technology, you should know much about newest stuff. So, you ... need to update, update your working experience and knowledge"*. This statement suggests that to survive in this industry, continuous learning is essential. In this case, it was found that some Combination managers used

the opportunity of learning as a means of reward. For instance, Manager C-002 argued that *"if they can perform well, I will do my best to let them try new technologies ... Particularly for those who are doing IT work, they like to try out and play with new technologies"*. Similarly, Manager C-003 emphasised that *"in my department, not everyone can get this opportunity to train abroad unless they perform extremely well"*. To conclude, the difference between the groups in this case appears to be context. Production work in the case of the Socialisation group was routine and the managers suggested that subordinates were motivated solely by money. In contrast, the context of information systems was one in which followers need to engage with their work in a qualitative manner.

The two groups were also different in another way, and this was concerned with the active involvement of managers in subordinates' activities. Only Combination managers made comments concerning this issue. Manager C-009 argued that *"if you want to be a leader in this kind of field, you at least have to involve yourself in everything from the beginning to the end ... you have to understand what happens during the process"*. Manager C-008 made it clear that *"I will use personal involvement"*. In the view of Manager C-020, leaders must have *"high rates of participation ... they have to participate as much as possible in activities carried out by the employees"*. The reason for participation and involvement, as indicated by Manager C-017, might be that *"when (subordinates) encounter problems, I can jump into action and help them immediately to see whether they are lacking in resources or whether their knowledge is insufficient"*.

The reason for Socialisation managers to show no interest in subordinates' activities may result from context. As revealed previously, this group was working to standard

operating procedures (SOPs). In this case, it seems that there is no need for the managers to participate because subordinates' activities have already been specified. Context can also be used to explain why the Combination managers were interested in getting involved in the subordinates' activities. Manager C-005 gave a description of their situation. He said that *"when we write programmes, it is so easy to make mistakes as this kind of thing is not like doing something in production line ... what we are doing is diverse"*. The more IT staff deal with changing and dynamic requirements, the more managers have opportunities to get involved in subordinates' activities. The above area of difference is therefore irrelevant to the propositions, since it arises from specific considerations that relate solely to the experience of the managers.

10.3 MANAGEMENT-BY-EXCEPTION

Judge and Piccolo (2004) define management-by-exception as the extent to which the leader "takes corrective action on the basis of results of leader-follower transactions" (p. 755). Management-by-exception can be distinguished as either active or passive, with the difference being based upon the timing of the leader's involvement (Howell and Avolio, 1993). In its passive form, leaders wait for problems, mistakes and deviances to occur before taking action (Bass et al., 2003). Notwithstanding the passive form of management-by-exception is sometimes needed (Bass and Riggio, 2006), it will not be considered in this section because this form does not apply to the managers of this study. So, this section only takes the active form of management-by-exception into account.

With the characteristic of active management-by-exception, the leader "specifies the standards for compliance, as well as what constitutes ineffective performance, and

operating procedures (SOPs). In this case, it seems that there is no need for the managers to participate because subordinates' activities have already been specified. Context can also be used to explain why the Combination managers were interested in getting involved in the subordinates' activities. Manager C-005 gave a description of their situation. He said that *"when we write programmes, it is so easy to make mistakes as this kind of thing is not like doing something in production line ... what we are doing is diverse"*. The more IT staff deal with changing and dynamic requirements, the more managers have opportunities to get involved in subordinates' activities. The above area of difference is therefore irrelevant to the propositions, since it arises from specific considerations that relate solely to the experience of the managers.

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With the characteristic of active management-by-exception, the leader "specifies the standards for compliance, as well as what constitutes ineffective performance, and

may punish followers for being out of compliance with those standards” (Bass et al., 2003, p. 208). This kind of leadership actively and continuously monitors the follower’s behaviour and performance, anticipates problems and takes corrective actions as necessary (Bass, 1999; Howell and Avolio, 1993; Judge and Piccolo, 2004). So, it can be said that the focus of active management-by-exception leadership is on “setting standards and monitoring deviations from these standards” (Bono and Judge, 2004, p. 902). Yukl (1999b) simply regards active management-by-exception as a form of monitoring. In the view of Bass and Riggio (2006), this active form may be needed and can be effective in some situations, such as when safety is of the essence.

10.3.1 Similarities between the two groups

The managers’ perceptions of management-by-exception are shown as Appendix M. By and large, both groups of managers talked about monitoring. For instance, Manager S-002 said that he would “*stay behind and monitor it*”. In the opinion of Manager S-017, the production line is a place where “*workers have to be monitored by higher levels so that everyone can move towards a common target*”. Manager C-002 suggested that “*you must monitor them in the first place to see whether their way of doing is the same as what you thought ... if there is no problem with that, you just need to monitor this thing regularly to see whether it is in progress*”. Manager C-007 took programmers as an example and indicated that “*the programme modified by them will be monitored by security control*”. Some other terms were used to describe the managers’ intention of monitoring subordinates. For instance, Manager S-009 will let the subordinates know that “*their supervisor will keep his eyes on what they are doing*”. Likewise, Manager C-004 said that “*normally, I just watch them closely and keep them from making trouble*”. For Manager C-006, watching “*new people*” was especially important.

Manager C-002 was not the only one who monitored subordinates regularly. Manager S-004 said that *“on every Friday, we will check how many cases have been dealt with ... (and) on every Monday, we will check the report”*. For Manager C-017, he will *“review (the subordinates) regularly, say every month or every quarter”*. He also hoped that they can give him a monthly report revealing *“what have been done this month, what should be done but not yet been done last month and what will be done next month”*. With the report, he can *“see progress and compare it with the others”*. Monitoring provided the basis for evaluation and appraisal. Manager S-004 stated that *“we will appraise them perhaps twice a year”*. Manager C-008 said that *“we will focus on personal actions and whether they are well conducted ... (and) will take this as an indicator of performance evaluation by the end of the year”*.

10.4 PAN-TRANSACTIONAL LEADERSHIP

Similar to pan-transformational leadership, the term *pan-transactional leadership* is used to include the behaviour which is not grouped into the scales of contingent reward and management-by-exception. This section will introduce two kinds of pan-transactional leadership behaviour: target-setting and managing subordinates through systems, procedures and rules. Setting goals or targets is one of the main emphases of transactional leaders (Dvir et al., 2002; Jung and Avolio, 1999). From the perspective of Lievens et al. (1997), transactional leaders can be effective to the extent that they *“clarify expectations and goals”* (p. 417). They are inclined to set goals because the transaction or exchange is based upon discussing requirements with subordinates (Bass and Riggio, 2006). In addition to setting goals, transactional leaders initiate structures (Hater and Bass, 1988). Waldman, Ramírez, House and Puranam (2001) argue that transactional leaders try to strengthen *“existing structures, strategies, and culture in an organization”* rather than to change them (p. 134). This

argument is supported by Bass and Avolio (1993) because from their point of view, transactional leaders operate within organisational cultures which follow “existing rules, procedures, and norms” (p. 112). Transactional leaders therefore use (existing) systems, procedures and rules to manage followers.

10.4.1 Similarities between the two groups

Appendix N reveals the managers’ perceptions of pan-transactional leadership. On the whole, both groups of managers seemed to believe that giving targets to subordinates was of the essence. For instance, Manager S-008 said that he will start by “*setting up targets*”. Manager C-017 made it clear that “*at the beginning of the year, I will give them objectives ... tell them clearly what kind of thing they should do and what kind of role they should play in the organisation*”. Manager S-012 expressed his opinion that “*basically, I just give them a target and see whether they can produce a certain amount of output within a certain period of time*”. For him, targets are set at the group level as “*each unit in the site has its own objective that ought to be achieved*”. But for Manager C-009, targets operate at the individual level because “*everyone must be given targets. Without targets, someone would quit half way through or get tired of doing things*”. From the perspective of Manager C-010, target-setting was applied “*not only to production units, but also to R&D, design and software engineering units*”. Manager S-004 talked about targets from the specific viewpoint of knowledge management. He said that “*no matter which kind of knowledge management you are doing*”, it is better to be target-oriented.

In addition to setting targets, both groups of managers talked about using systems, procedures and rules to manage subordinates. For instance, Manager S-005 said that “*for those who are on a production line, you just have to give them some rules to*

follow". Likewise, Manager S-006 suggested that *"you just let them follow the rule set by the company"*. Manager C-014 made it clear that *"while managing people, you only need to know that they follow your procedures"*. Manager C-018 said that *"if you do not give them devices, systems or forms to fill in, some employees may have no idea about what they are going to record ... there must be something that anyone can follow up, check up. Otherwise, no one knows how to do things"*. Manager C-019 stated that *"I prefer not to be authoritative, saying that you have to do this or you have to do that ... I use systems to manage them ... we have regulated relevant standards and norm. Everybody has to follow these systems"*.

Standard operating procedures (SOPs) were mentioned by both groups of managers. From the perspective of Manager S-016, systems involved *"SOPs, operation guidelines and so on"* and *"in the manufacturing sector, you must have SOPs to follow"*. He was not the only one who made such a comment. Manager S-008 stated that *"I become careful and methodical in the Production Department ... everyone has to follow SOPs. Everyone has to obey rules"*. The Combination managers also talked about SOPs. For instance, Manager C-016 said that *"we have ISO standard manuals and a wide range of SOPs. We keep updating them all the time"*. Manager C-019 suggested that *"first of all, I will set up SOPs or something like ISO9001 ... This kind of stuff will regulate whatever you do; you have to keep a record"*. As Manager C-015 indicated, with SOPs many aspects of work, including *"how to key in, what to key in and where to key in"* can be regulated. So, it can be argued that they were using systems or SOPs to manage Combination. This empirical finding of using SOPs to manage knowledge conversion supports the idea of Turner and Makhija (2006). They suggest that control mechanisms play a crucial role in managing knowledge in a firm.

10.5 SUMMARY

This chapter presents the managers' comments on Socialisation and Combination from the viewpoints of contingent reward, management-by-exception and pan-transactional leadership. There were only two dimensions showing differences between the two groups, and these were based upon context. The first dimension related to reward variety. Compared with the Socialisation group, the kind of reward discussed by the Combination group was varied because their work was more demanding and complicated. The second dimension was concerned with involvement and participation in subordinates' activities. The Socialisation managers made no comment about this issue probably because their subordinates only follow SOPs so that there was no need to provide assistance through personal involvement. But for the Combination managers, they helped subordinates by participating in their activities because their work was diverse and challenging.

On the whole, the qualitative findings presented in this chapter support the quantitative findings from Chapter 6. There was no major difference between the groups representing Socialisation and Combination. Where differences occurred, these appeared to derive from the context of production or IT/IS rather than from inherent characteristics of Socialisation or Combination. As regards the research propositions of this research, this chapter confirms that the Socialisation process also depends upon transactional leadership and the Combination process involves transactional leadership. In the next and final chapter, efforts will be devoted to revealing what has been learned from this research and the extent to which this research makes a contribution to knowledge and practice.

11

DISCUSSION AND CONCLUSION

11.1 INTRODUCTION

This chapter reviews and discusses the research presented in this dissertation. It begins by summarising the development of the research idea, the research itself and the findings. After that, the extent to which this research contributes to knowledge and practice is discussed. Attention is then directed to considering the limitations of the research. Finally, suggestions are made for future research.

11.2 OVERALL REVIEW

In this section, attention will be paid to reviewing the research which was undertaken. This provides an overview of the development of the research question, the subjects involved in the research, the research methodology and the findings.

This research brings together the two areas of knowledge management and leadership. The idea of bringing these areas together is the emerging awareness of the importance of context in the knowledge management field (Cohen, 1998; Powell and Swart, 2005). Leadership seems to be critical to the development of an appropriate context (e.g. Eppler and Sukowski, 2000; Nonaka and Konno, 1998; Senge, 1990a, 1990b). The knowledge conversion concepts developed by Nonaka and Takeuchi (1995) provide a focus for the study and these are linked to different kinds of leadership. This is because according to Nonaka and Konno (1998), the four types of

knowledge conversion processes (Socialisation, Externalisation, Combination and Internalisation) are conducted under four different kinds of context (originating *ba*, interacting *ba*, cyber *ba* and exercising *ba*). This suggests that four different kinds of leadership may be appropriate. As regards leadership, the transformational-transactional leadership paradigm proposed by Bass (1985) provides the basis for this study. The reason for selecting this particular way of considering leadership is that on the one hand, transformational leadership has long been associated with knowledge management, and on the other hand, transactional leadership may be important to knowledge management (Vera and Crossan, 2004). The precise mix of transformational and transactional elements necessary to context or *ba* has not been studied previously and this provides a research opportunity. So, the research question pursued in this study is the extent to which different knowledge conversion processes may benefit from transformational leadership, transactional leadership or a mixture of both.

Triangulation was adopted here as a research strategy and both qualitative and quantitative methods were used. For the qualitative aspect of the study, scenarios and descriptions derived from Nonaka and Takeuchi (1995) were used; for the quantitative instrument, the MLQ (Multifactor Leadership Questionnaire) developed by Bernard Bass and Bruce Avolio was selected. As regards the subjects involved, managers with a number of years in the experience of leadership were drawn from Taiwan. Due to exploratory nature of this research, pilot studies were conducted. In the first pilot study, twenty Taiwanese managers were involved and were divided into four groups representing the four knowledge conversion processes (five managers in each process). It was found that the four groups were not sufficiently different in their approaches to leadership to support propositions developed from the literature

review suggesting differences. The major limitation of the study design was that most of the managers in this pilot study talked in very general terms about their ways of leading people, rather than addressing the scenarios which were intended to focus their comments.

In the second pilot study, twelve managers were recruited. They were asked to pay particular attention to the materials provided, which were based upon descriptions rather than scenarios, and they were instructed to fill in the questionnaire in accordance with their opinions about the leadership requirements for the specific knowledge conversion processes, as defined. This pilot study built upon the experience gained from the first pilot study. The primary change restricted the choice of knowledge conversion processes to two extreme forms (Socialisation and Combination). Interviewees concentrated on the descriptions in this pilot study and their comments suggested that they were able to relate leadership style to knowledge conversion processes. However, comments based upon leadership experience were also evident and there were few discernable differences between the groups.

So, the main study is more specific and large-scale. Forty Taiwanese managers were recruited for the main study and they were divided equally into the groups of Socialisation and Combination. Managers in the Socialisation group had experience in leading production staff, and managers in the Combination group had experience in leading IT/IS staff. The reason for this research design was derived from Nonaka and Takeuchi (1995). Apprenticeship, an important example used by Nonaka and Takeuchi to illustrate Socialisation, tends to appear within production activities, whilst combining various bodies of explicit knowledge is illustrated through examples related to IT/IS departments. This bi-polar, two-functional comparison

builds upon the insight that managers are able to discuss leadership by focusing on the descriptions developed for the research instrument, but also allows comparisons to be drawn in the event that the subjects also talk about their personal leadership experience. The main study therefore built upon experiences gained from the pilot studies and provided the best opportunity to uncover differences in leadership styles for different knowledge conversion processes, should such differences be a feature of knowledge management.

The quantitative findings show no significant differences between the Socialisation (Production) and Combination (IT/IS) groups in terms of the MLQ for either the *t*-test or MANOVA. This finding is apparent at two levels. At the most general level, the Socialisation group does not differ from the Combination group for transformational leadership, transactional leadership or leadership as a whole. At the more specific level, the groups are not different in any single scale of the MLQ. For both groups, the results show that transformational leadership is significantly different from transactional leadership. Transformational leadership as a whole is more important than transactional leadership for both Socialisation and Combination groups. The transactional scale of contingent reward is also important to both groups. This strong correlation between transformational leadership and contingent reward is supported by Judge and Piccolo (2004).

Although no differences were evident at the quantitative level, small but important differences arose during the qualitative phase of the main study. Those differences are limited, but they are genuine and can be seen as one of the most important findings of this study. They are all transformational leadership characteristics and refer to a strong sense of purpose, a compelling vision of the future and the need for

long-termism. As regards a strong sense of purpose, the finding revealed that this characteristic is necessary for the Combination group, but not for the Socialisation group. This difference results from the characteristics of Combination itself. Combination is concerned with selecting, combining and processing explicit knowledge from inside and/or outside the organisation to form “more complex and systematic sets of explicit knowledge” (Nonaka and Toyama, 2007, p. 17). Since more complex and systematic explicit knowledge is formed through sorting, adding and categorising different bodies of explicit knowledge, it can therefore be argued that this must involve a sense of purpose. Without a sense of purpose, it would be difficult to explain why simple sets of explicit knowledge need to be processed to become more complex sets of explicit knowledge. There is another reason to support the importance of purpose in Combination, and it is related to the elements involved. According to Nonaka and Takeuchi (1995), explicit knowledge is combined or exchanged through media such as documents, meetings or computerised communication networks. These media are more likely to be used purposefully because it can be argued that they represent a kind of resource in an organisation.

The situation is similar to a compelling vision of the future that the Combination group indicated the necessity of this characteristic, but the Socialisation group did not. The result of Combination explains why a vision of the future is needed. It is known that Combination is a process of converting explicit knowledge to an alternative kind of explicit knowledge. Notwithstanding that input and output are both explicit knowledge, their characteristics are different. The former can be seen as raw explicit knowledge; the latter can be viewed as processed explicit knowledge. Regarding processed explicit knowledge, Nonaka and Toyama (2007) define it as complex and systematic explicit knowledge. Nonaka and Takeuchi (1995) explain it

in a more practical way. They argue that such knowledge is systematic and it can be “a new product, service, or managerial system” (p. 71). Since Combination is about creating a prototype, new component technologies or “new potential knowledge” (Smith, Collins and Clark, 2005, p. 347), to a large extent it means that it involves an idea of development. Peltokorpi et al. (2007) argue that combinations of explicit knowledge are about to “develop creative and innovative product concepts” (p. 56). As long as the idea of development is implicated, a vision of the future then becomes important. This is because without a vision of the future, development will have no base to rely upon. Only the Combination group considers a sense of purpose and a vision of the future to be essential requirements of leadership for specific knowledge conversion process.

The reason why the Socialisation group did not concern itself with purpose and vision can be argued to be that, from the point of view of managers, subordinates need to gain experience through practice. Managers thus believe that there is no need for subordinates to have a strong sense of purpose and/or a vision of the future because their world is defined by ongoing social relationships. Socialisation is a broad, dynamic and continuous process (Nonaka and Takeuchi, 1995). It is associated with originating ba, which relates to the socialisation process within which feelings, experiences and emotions are shared between individuals (Nonaka and Konno, 1998). Originating ba centres upon face-to-face interactions in which individuals meet to share experiences and mental models (Nonaka et al., 2006). Socialisation thereby involves a wide range of activities from, for instance, having meals in the cafeteria, to making observation of colleagues’ and supervisors’ behaviour, and comprises formal and informal interactions, including those in which “participants discuss difficult problems while drinking sake, sharing meals, and

taking a bath together in a hot spring" (Nonaka and Takeuchi, 1995, p. 63). These are all inherently social processes.

The groups were also different in terms of the need for long-termism. However, this difference raises different arguments. The difference was that the Combination group viewed long-termism as a goal, whereas the Socialisation group considered long-termism as a means. For the Combination group, managers need to pursue long-termism because their actions involve development and, similar to the arguments concerning a compelling vision of the future, the need for long-termism is a premise for development. From the managers' point of view, long-termism is integrated with a vision of the future, and they suggested that those who are doing Combination work have to look ahead and meet requirements for the future. However, for the Socialisation group, they regard long-termism as a means because it is restricted to the need for subordinates to pursue continuous effort to accumulate experience. Managers from this group argued that the success of Socialisation is dependent upon long-term, continuous implementation but the process inherently emphasises here-and-now and immediate practice and experience.

In addition to the above, there are other findings and which complement Gourlay's (2006) criticism about the conceptual framing provided by Nonaka and his colleagues. The present study found that Combination is not the only process involved in IT/IS. From IT/IS managers' viewpoint, there is no doubt that what their people are doing centres on Combination process because this work involves integrating different bodies of information. However, some managers said that apprenticeship is also necessary. They argued that IT/IS people require tacit knowledge and experience to make judgements and IT/IS work is actually dependent

upon the accumulation of experience. So apprenticeship is needed to impart relevant experience. Given that, IT/IS needs Socialisation to complement Combination. To a certain extent, this practical finding reflects weaknesses in Nonaka and colleagues' arguments about the cycle through which tacit and explicit transformations take place (Gourlay, 2006). Rather than being a complete cycle, beginning with socialisation, knowledge management in practice may involve a restricted number of the knowledge conversion processes. In the case of the present study, socialisation and combination appear to be adequate to explain the practice of IT/IS. This point can also be argued to be implicit in Nonaka and Takeuchi's (1995) example of bread making, where one knowledge conversion process alone may be capable of explaining knowledge management in practice.

Equally, socialisation and internalisation are necessary to explain knowledge management for production. It was found in the present study that the activity of production involves using SOPs to establish basic rules before socialisation begins. As SOPs are well written and articulate, this suggests that this activity relies upon explicit knowledge as a base to engender tacit knowledge. Production initially involves the Internalisation process. Once production staff digests SOPs, they subsequently develop competence through discussion, the observation of the activities of others and repetition of the task. At this stage, Socialisation is dominant because experiences are shared and accumulated. So the situation encountered was that Internalisation and then Socialisation were involved in production. Not only does this finding again reflect the lack of wider empirical grounds for Nonaka and colleagues' conceptualisation of knowledge management (Gourlay, 2006), but it also supports a further criticism raised by Gourlay. He argues that there is no reason for knowledge conversion to begin with Socialisation because Internalisation also

generates new tacit knowledge. Indeed, in this case of production, knowledge conversion did not begin with Socialisation but with Internalisation.

11.3 CONTRIBUTION TO KNOWLEDGE

The most important contribution to knowledge is that this study discovers that different knowledge conversion processes require subtly different perceptions of leadership. Notwithstanding that the difference only appears on limited dimensions of transformational leadership, implication for the literature of knowledge management is significant. This finding adds to the argument of Nonaka and Konno (1998) that there are four different knowledge conversion processes (Socialisation, Externalisation, Combination and Internalisation) conducted under four different contexts (originating *ba*, interacting *ba*, cyber *ba* and exercising *ba*). The finding of this study extends their argument in a sense that different knowledge conversion processes require different kinds of leadership albeit at a detailed and specific level. This study appears to be the first to develop and provide empirical support for Nonaka and Konno's propositions from the perspective of leadership. Further studies are needed which seek to explore these differences, not at the very general level of leadership, transformational leadership and transactional leadership, but at detailed, specific levels of leadership characteristics.

The second contribution is related to the style of leadership required by Socialisation and Combination processes. The literature review showed that the process of Socialisation depends upon transformational leadership and the process of Combination requires transactional leadership. However, this research discovers that Socialisation process depends upon not only transformational leadership but also transactional leadership and Combination process requires not only transactional

leadership but also transformational leadership. In other words, this research finds that both transformational and transactional leadership are involved in both processes of Socialisation and Combination. This finding is drawn from the perspective of methodological triangulation because it is supported by both quantitative and qualitative evidence. Given that, this research makes a contribution to leadership literature as it seems to be the first to confirm that leaders also need to be both transformational and transactional in the context of knowledge conversion process. This research also makes a contribution to knowledge management literature. It supports Vera and Crossan's (2004) argument that transactional leadership is also important to knowledge management.

The third contribution is that this research provides a methodology to show that there are differences between knowledge conversion processes in transformational leadership and not only transformational leadership but also transactional leadership are of the essence to knowledge conversion processes. This methodology is not based upon entirely new instruments but integrates Nonaka and Takeuchi's (1995) idea of knowledge conversion process with Bass's (1985) theory of transformational and transactional leadership. In the existing knowledge management literature, scholars at most point out that leadership should play an important role in enabling knowledge management. They have been reluctant to divide the general concepts of knowledge management and leadership into more detailed and practical terms and then to examine the inter-relationships. In contrast with other studies, this study splits the idea of knowledge management into knowledge conversion processes, identifies specific kinds of leadership characteristics and then examines knowledge conversion processes and leadership characteristics for the most appropriate combinations.

This research brings a final contribution to knowledge in that it provides a gateway to understanding collectivistic managers' perceptions of knowledge management and leadership. Most scholars except Nonaka and Takeuchi (1995) seem to be based on western and developed economies where subjects belong to individualistic cultures. Under these circumstances, this study provides an alternative viewpoint on the knowledge management field. The importance of Asian countries is increasing with China, the world's largest, single collectivistic country, beginning to take the lead. If future research wants to study, for instance, how leadership is applied to knowledge conversion processes under other collectivistic cultures such as China, this study can play a role in providing a reference point or contrast. This is because from the point of view of Hofstede (2001), both Taiwan and China are relatively low in the cultural dimension of individualism.

11.4 CONTRIBUTION TO PRACTICE

This research also has practical relevance. First, on the basis of this study's results, perceptions of knowledge management can be increased. The results suggest that knowledge management should no longer be considered as a general concept. As a matter of fact, knowledge management has different meanings to different kinds of business activities. For instance, the activity of production involves Internalisation and Socialisation dimensions of knowledge management; the activity of IT/IS depends upon Combination and Socialisation dimensions of knowledge management. The implication for practitioners is that they can have a clearer understanding of what they have been involved in from the perspective of knowledge management.

Second, on the basis of the finding that knowledge management is in fact a dynamic concept, this research further associates leadership styles with business activities of

production and IT/IS. It suggests that to lead those who are in the context of production, where their work involves knowledge conversion processes of Internalisation and Socialisation, leaders must have particular characteristics. They have to trust followers; display a sense of power and confidence to followers; try to win followers' hearts and minds; pay attention to developing and supporting; reward followers; monitor followers; set targets for followers and use systems to manage followers. However, to lead those who are in the context of processing information, where their work implicates knowledge conversion processes of Combination and Socialisation, in addition to the above characteristics, this study suggests that leaders also have to display a sense of purpose, create a vision of the future and be long-termist. This is because compared with production, the work of processing information involves development.

These findings have two levels of managerial implication. One relates to the training of appropriate leadership. Top management can make use of this study to train production and IT/IS managers to become more professional and dedicated in terms of leadership. In other words, this study can help to design leadership training schemes for those two groups of managers. In addition to providing a basis for those managers to develop the designated leadership characteristics, more importantly this study suggests that those managers' leadership characteristics should be different even though the differences are subtle. So, the further implication for top management is that production managers and IT/IS managers should have their own leadership training schemes.

The other level of managerial implication concerns making the system of rewarding more elaborate. Managers can draw upon this study to design appropriate rewarding

systems for production and IT/IS staff. The findings of this study suggest that for production staff the form of reward should be tangible rewards like money or bonuses. So, the implication for production managers is that they can use more pecuniary means to reward their subordinates. For IT/IS staff, however, this study suggests that the form of reward should be varied. In addition to money or bonuses, other forms of reward such as providing an opportunity of training abroad can also be taken into consideration. Therefore, the implication for IT/IS managers is that they cannot solely reward their subordinates with pecuniary means. They have to reward their subordinates with a wide range of options.

11.5 LIMITATIONS OF THE RESEARCH

The first limitation is that this research only considers leaders' opinions. It is natural that only leaders' opinions are taken into account when a study implicates leadership. However, the disadvantage of considering one aspect of a research study is that it ignores other aspects. Followers' opinions were not examined in this study. This omission sets to one side the possibility that followers may have different perceptions compared with leaders. Followers' opinions could be critical because they are the ones who are actually involved in the detail of knowledge conversion. They may have their own thinking about the desirable behaviours, characteristics and attitudes. To sum up, limited evidence is the first limitation of this research.

The second limitation concerns validity and reliability. There is, for instance, no assurance that managers were focused on the mindset of their particular knowledge conversion process whilst being interviewed or filling in the questionnaire. From pilot studies to main study, there were some managers who were interested in talking about their daily lives. Although most of the time was still spent on explaining ways

of leading subordinates, managers did not fully refer to how leadership may lead to good results for knowledge conversion. In consequence, the questionnaire might have been completed with regard to general considerations. This could be the reason why no quantitative difference was shown between the groups. In fact, efforts had been made to prevent this situation from happening. For instance, the research design was revised as between the pilot and main studies and managers were constantly reminded to respond in accordance with descriptions. These considerations may explain the limitations explained in detail in the earlier chapter that addressed reliability and validity. To tackle this problem, a more sophisticated research design needs to be developed, and this is a job for the future.

11.6 FUTURE RESEARCH

Efforts can first be made to improve the quality of scenarios and descriptions. One way to make them more valid is through further modification. A group of managers may be recruited to improve upon the scenarios and descriptions provided by Nonaka and Takeuchi (1995). In particular, the chosen scenarios proved to be too general for this study, and managers appeared to draw upon their own experience in preference to working through the scenarios. The present study abandoned the use of scenarios in turning towards descriptions of the relevant constructs, but there may be potential research opportunities provided by returning to research methods linked to scenarios. In this way, managers may develop scenarios which cover real situations of knowledge conversion which are more compelling to those developed by Nonaka and Takeuchi. Once the scenarios are modified by one group of managers, they can then be combined with the MLQ for testing by another group of managers.

In addition to modifying knowledge conversion scenarios and descriptions, managers

may be encouraged to clarify the relationship between knowledge conversion processes and various business activities. This clarification is needed because Nonaka and Takeuchi (1995) fail to reveal where and for whom a particular knowledge conversion process can apply. Such clarification is important in order to make the model of SECI more closely associated with reality. In this case, managers may need to indicate, for instance, if the Combination process is only related to the context of IT/IS and if the Socialisation process really applies to the activity of apprenticeship. They may also need to provide opinions about how Externalisation and Internalisation processes interact with in business activities. Managers may also discuss from their own experience whether a particular business activity involves one kind of knowledge conversion process. In other words, we need a better understanding concerning whether knowledge conversion is a dynamic process involving tacit to explicit knowledge transformations, whether it is a dynamic process which cannot be reduced to concepts such as tacit and explicit knowledge or whether it can be reduced to four knowledge conversion processes and related *bas*.

This research has reached the finding that leaders have to be transformational as well as transactional in order to stimulate followers to conduct knowledge management. This finding is supported by the leadership literature which argues that the best leaders are both transformational and transactional (Bass, 1999). However, in the latest study by Ichijo (2007), it seems that transactional leadership still has no foothold in the field of knowledge management. He argues that "while you may be able to manage related organizational processes, such as community-building and knowledge exchange, you cannot enable knowledge management by command-and-control approaches" (p. 95). Ichijo's study implies that transformational leadership is the only enabler for knowledge management. There is

therefore conflict between findings from the leadership literature and views expressed in the knowledge management literature. So, the implication for future research is that attention should be paid to transactional leadership to see if it can enable knowledge management. The transactional element of contingent reward could provide a good starting point. This is because this study has already shown that contingent reward is critically important.

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