An Exploration of Knowledge Management and Intellectual Capital in a Nonprofit Organisation Context

by

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Abstract

In recent years, practitioners and researchers alike have turned their attention to knowledge management (KM) in order to increase organisational performance (OP). As a result, many different approaches and strategies have been investigated and suggested for how knowledge should be managed to make organisations more effective and efficient. However, most research has been undertaken in the for-profit sector, with only a few studies focusing on the benefits nonprofit organisations might gain by managing knowledge. This study broadly investigates the impact of knowledge management on the organisational performance of nonprofit organisations.

Organisational performance can be evaluated through either financial or non-financial measurements. In order to evaluate knowledge management and organisational performance, non-financial measurements are argued to be more suitable given that knowledge is an intangible asset which often cannot be expressed through financial indicators. Non-financial measurement concepts of performance such as the balanced scorecard or the concept of Intellectual Capital (IC) are well accepted and used within the for-profit and nonprofit sectors to evaluate organisational performance. This study utilised the concept of IC as the method to evaluate KM and OP in the context of nonprofit organisations due to the close link between KM and IC: Indeed, KM is concerned with managing the KM processes of creating, storing, sharing and applying knowledge and the organisational KM infrastructure such as organisational culture or organisational structure to support these processes. On the other hand, IC measures the knowledge stocks in different ontological levels: at the individual level (human capital), at the group level (relational capital) and at the organisational level (structural capital). In other words, IC measures the value of the knowledge which has been managed through KM.

As KM encompasses the different KM processes and the KM infrastructure facilitating these processes, previous research has investigated the relationship between KM infrastructure and KM processes. Organisational culture, organisational structure and the
level of IT support have been identified as the main factors of the KM infrastructure influencing the KM processes of creating, storing, sharing and applying knowledge. Other research has focused on the link between KM and OP or organisational effectiveness. Based on existing literature, a theoretical model was developed to enable the investigation of the relation between KM (encompassing KM infrastructure and KM processes) and IC. The model assumes an association between KM infrastructure and KM processes, as well as an association between KM processes and the various levels of IC (human capital, structural capital and relational capital). As a result, five research questions (RQ) with respect to the various factors of the KM infrastructure as well as with respect to the relationship between KM infrastructure and IC were raised and included into the research model:

RQ 1  Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?

RQ 2  Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?

RQ 3  Do nonprofit organisations which have a stronger IT support have a higher value of Human Capital than nonprofit organisations which have a less strong IT support?

RQ 4  Do nonprofit organisations which have a stronger IT support have a higher value of Structural Capital than nonprofit organisations which have a less strong IT support?

RQ 5  Do nonprofit organisations which have a stronger IT support have a higher value of Relational Capital than nonprofit organisations which have a less strong IT support?

In order to investigate the research questions, measurements for IC were developed which were linked to the main KM processes. The final KM/IC model contained four items for evaluating human capital, five items for evaluating structural capital and four items for evaluating relational capital.

The research questions were investigated through empirical research using a case study approach with the focus on two nonprofit organisations providing trade promotions
services through local offices worldwide. Data for the investigation of the assumptions were collected via qualitative as well as quantitative research methods. The qualitative study included interviews with representatives of the two participating organisations as well as in-depth document research. The purpose of the qualitative study was to investigate the factors of the KM infrastructure (organisational culture, organisational structure, IT support) of the organisations and how these factors were related to each other. On the other hand, the quantitative study was carried out through an online-survey amongst staff of the various local offices. The purpose of the quantitative study was to investigate which impact the level of IT support, as the main instrument of the KM infrastructure, had on IC.

Overall several key themes were found as a result of the study:

- Knowledge Management and Intellectual Capital were complementary with each other, which should be expressed through measurements of IC based on KM processes.
- The various factors of the KM infrastructure (organisational culture, organisational structure and level of IT support) are interdependent.
- IT was a primary instrument through which the different KM processes (creating, storing, sharing and applying knowledge) were performed.
- A high level of IT support was evident when participants reported higher level of IC (human capital, structural capital and relational capital).

The study supported previous research in the field of KM and replicated the findings from other case studies in this area. The study also contributed to theory by placing the KM research within the nonprofit context and analysing the linkage between KM and IC. From the managerial perspective, the findings gave clear indications that would allow interested parties, such as nonprofit managers or consultants to understand more about the implications of KM on OP and to use this knowledge for implementing efficient and effective KM strategies within their organisations.
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Measurements:

| OC           | Organisational Culture measurement |
| OS           | Organisational Structure measurement |
| IS           | IT Support measurement |
| HC/EC        | Employee Capability: measurement for Human Capital |
| HC/ES        | Employee Satisfaction: measurement for Human Capital |
| HC/ESu       | Employee Sustainability: Measurement for Human Capital |
| SC/ITS       | IT Systems: measurement for Structural Capital |
| SC/OP        | Organisational processes: measurement for Structural Capital |
| RC           | Measurements for Relational Capital |
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To the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made to that material.

__________________________
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*The beginning of knowledge is the discovery of something we do not understand.*

Frank Herbert
Chapter 1

Introduction

This chapter is divided into four parts. In part one, a summary of the key concepts addressed in this study is given. The research objectives and research questions are introduced in part two followed by arguments for the importance of the topic in part three. Finally, part four will explain the framework of the thesis.

Figure 1.1: Overview of Chapter 1

1.1 Background Information

1.1.1 Nonprofit Organisations

Nonprofit organisations are facing environmental pressures due to factors such as shifts in government funding (Craig, Taylor and Parkes, 2004), declining volunteer support (Lyons, 2001), the growing number of organisations seeking financial support (Chetkovich and Frumkin, 2003), and the growing competition with for-profit and the public sector offering services which used to be typical nonprofit domains (Tuckmann, 1998; Ramia and Camey, 2003). As a result, nonprofit organisations are required to continuously improve their performance and also to demonstrate their improvement (Lettieri, Borga and Savoldelli, 2004). The need for management concepts which might help nonprofit organisations deal with these problems and that are able to fit in the nonprofit environment has become a focus of research attention (Kong, 2007; Backman,

Nonprofit organisations can vary much in regards to size, organisational culture, organisational structure or mission (Anheier, 2000). While some are more comparable with organisations of the public sector, others are more closely oriented to the private business sector. Indeed, Lettieri et al. (2004) argue that the heterogeneity of the nonprofit sector makes it extremely difficult to define a general roadmap to achieve excellence. Despite these differences, there is an emerging consensus among researchers in the field that nonprofit organisations have the following core characteristics (Salamon and Anheier, 1997):

- **Organised**, i.e. possessing some institutional reality, which separates the organisation from informal entities such as families, gatherings or movements;
- **Private**, i.e., institutionally separate from government, which sets the entity apart from the public sector;
- **Non-profit-distributing**, i.e., not returning any profits generated to owners or equivalents, which distinguishes non-profits from businesses;
- **Self-governing**, i.e., equipped to control their own activities which identifies those that are de jure units of other organisations; and
- **Voluntary**, i.e., being non-compulsory in nature and with some degree of voluntary input in either the agency’s activities or management.

**Lack of profit motive, multiple constituencies and the consequences**

The missing profit motive and multiple constituencies are often the main arguments for reasons why measuring organisational performance is problematic in nonprofit organisations.

The measurement and management of organisational performance is a difficult task and there are certain characteristics of nonprofit organisations which makes it even more complicated. Compared to nonprofit organisations, for-profit organisations have three important common features that reduce the complexity of performance management...
(Speckbacher, 2003). First, despite the great variety of businesses, all business enterprises share the characteristic of having one privileged interest group (owners) that is clearly defined and the interests of the owners of a firm guide the firm’s policy. Second, the interests of this privileged group concerning the preferred firm policy are relatively homogenous and easy to communicate as well as measurable. In publicly traded companies, where ownership tends to be highly dispersed, stock prices provide an assessment for success. Third, financial measures provide a relatively clear and accessible ultimate scorecard of organisational performance that allows the managers to assess different courses of action with respect to their value for owners (Speckbacher, 2003).

For nonprofit organisations, the situation is more complex. Nonprofit organisations have no single, clearly defined primary interest group that is homogenous with respect to interests, and whose goals are easily expressible through performance measures (Speckbacher, 2003). Nonprofit organisations are built around their mission, which is hard to measure. Furthermore, they serve a multitude of constituencies whose goals and needs are often relatively heterogeneous. Therefore, it seems obvious that it is often complicated if not impossible to blindly transfer for-profit sector concepts and tools for performance measurement and management to nonprofit organisations without any modification.

This stated, recent research shows that boundaries between for-profit and nonprofit organisations are becoming more blurred (Speckbacher, 2003; Rose-Ackermann, 1996; Kanter and Summers, 1987) for two reasons. First, while financial measurements were sufficient in an economy dominated by tangible assets, in today’s economy, where intangible assets and skills have become major sources of competitive advantage, tools that can measure knowledge-based assets are becoming increasingly important (Patton, 2007). Further, recently developed tools for performance management in the for-profit sector are showing evidence for a change in perception about what is valuable for a company. Second, nonprofit organisations are becoming more and more conscious of the importance of performance measurements and accountability (Speckbacher, 2003).
Assessment of whether organisations fulfil their missions properly can only take place if nonprofit organisations provide information on their performance. If such an assessment is not possible, public trust in nonprofit organisations can be lost (Herzlinger, 1996). Since financial performance measurements are not applicable for nonprofit organisations, nonprofit organisations also have to explore non-financial performance measures which allow them to evaluate and compare the intangible assets of the organisation.

Following Anheier (2000), the lack of a profit motive also leads to the ‘law of non-profit complexity’. Indeed, the lack of the profit motive implicates a wide range of preferences, motivations and objectives which need to be considered in nonprofit organisation. The environment of a nonprofit organisation (managing diverse constituencies, stakeholders and multiple revenue resources) together with the internal components (board, staff, volunteers, client and users) increase the difficulty of managing the organisation. In this context, the ‘law of non-profit complexity’ states that nonprofit organisations tend to be more complex than business firms of comparable size (Anheier, 2000). Kanter and Summer (1987) support this view and suggest that the existence of multiple constituencies lies at the core of management dilemmas in nonprofit organisations.

Anheier (2000) argues that the model of nonprofit organisations (as conglomerates of multiple organisations) represents a possible analytical framework to understand the various dimensions involved in nonprofit organisations, and he presents four crucial dimensions:

a) tent or palace: refers to the values of the organisation. A ‘palace organisation’ values predictability over improvisation, dwells on constraints rather than opportunities, borrows solution rather than inventing them, defends past action rather than devising new ones, favours accounting over goal flexibility, searches for final solutions, and discourages contradictions and experiments (Anheier, 2000; Hedberg, Nyston and Starbuck, 1976; Weick, 1977). On the other hand, a ‘tent organisation’ places emphasis
on creativity, immediacy and initiative, rather than authority, clarity and decisiveness (Hedberg et al., 1976; Starbuck and Dutton, 1973; Mintzberg, 1983). Whereas tent organisations represent the management styles of “adhocracy” (Mintzberg, 1983), palaces come closer to the models of Taylorism and classical organisational theory (Anheier, 2000).

b) **technocratic or social culture**: while technocratic culture emphasis functional performance criteria, task achievement, set procedures and operate under the assumption that organisations are problem-solving machines, social cultures are more people oriented and are more akin to “families” rather than machines (Anheier, 2000).

c) **hierarchy or networks**: organisations as hierarchies involve centralised decision-making, top down approaches to management, low span of control for middle management, and emphasis on vertical relations among staff. In contrast, organisations as network emphasise decentralisation and bottom-up approaches in decision-making, and encourage work groups as well as horizontal relations among staff and management (Anheier, 2000).

d) **outer-directed or inner-directed**: outer-directed organisations look primarily at other organisations and constituencies; they react to the environmental stimuli and take their models and solutions from it (Kieser and Kubicek, 1983). Inner-directed organisations on the other side emphasise a more selective view of the environment, focus on their own objectives and world view (Probst, 1987). The internal organisation rather then the larger environment becomes the primary source for solutions and strategies (Anheier, 2000).

For Anheier (2000), the challenge of nonprofit organisations lies in finding a balance between the different, often contradictory elements of the four dimensions.
1.1.2 Knowledge Management (KM)

In the last thirty years, many new and different strategic management concepts have emerged such as the resource-based view (or the later developed knowledge-based view of a firm) which focus on internal capacities of the firm. While, traditional strategy models - such as Michael Porter's five forces model (Porter, 1991) - focus mainly on the company's external competitive environment and most of them do not attempt to look inside the company. In contrast, the resource-based view or the knowledge-based view highlight the need for compatibility between the external market context in which a company operates and its internal competences.

The resource-based view argues that a firm’s advantage over its competitors originates from the use of valuable, hard-to-imitate and hard-to-substitute assets (Patton, 2007). The main prescription of this asset-based theory of the firm is that strategic assets are crucial determinants of sustainable competitive advantage and, therefore, firm performance (Wernerfelt, 1984). Based on the resource-based view the knowledge-based view emerged with knowledge as the main asset for competitive advantage (Grant, 1996b).

Knowledge management (KM) is largely regarded as a process involving various activities, also referred to as KM processes: knowledge creation, knowledge storing, knowledge sharing and knowledge application (Alavi and Leidner, 2001). KM offers ways to improve practices and procedures, develop and enhance employee capabilities, decrease the learning curve associated with new employees or new tasks, improve customer service, and reduce cost (Roman-Velasquez, 2004).

In knowledge management, as it is for any other business strategy, there are few areas in which reasonable results ensure successful performance. These areas are defined as critical success factors which are building the KM infrastructure. The KM infrastructure is regarded as the backbone of KM (Zaim, Tatoglu and Zaim, 2007; Davenport and Voelpel, 2001). Therefore, the efficient and effective application of KM requires a strong and appropriate KM infrastructure (Tiwana, 2000). There is a diverse perspective
within the knowledge management field regarding the identification of these factors which will be further discussed in Chapter 2.2.2 – KM infrastructure. The present study focuses on three main factors of the KM infrastructure: organisational culture, organisational structure and IT support.

KM systems (KMS) refer to a class of information systems developed to support and enhance the organisational processes of knowledge creation, storage, sharing and application (Alavi and Leidner, 2001). KMS are the effective application of management best practices and information technology tools to deliver the best available knowledge to the right person at the right time to solve a problem, make decisions, or capture expertise while performing their work (Roman-Velasquez, 2004). Therefore, the implementation of a KMS can increase effectiveness, efficiency and innovation (Roman-Velasquez, 2004).

1.1.3 Organisational Performance (OP)

From a traditional perspective, organisational performance is commonly referred to as financial performance where considerations of budgets, assets, operations, services, markets and human resources are crucial in determining the overall bottom-line of an organisation (Dixon, 1999; Thurbin, 1994; Smith, 1999). As such, the financial benefits of organisational performance are often associated with organisational success (Thurbin, 1994). However, the notion of performance embraces a far wider dimension of interpretations. The importance of performance measurement systems (PMS) is manyfold. PMS demonstrates what an organisation does, how well it does it and how much progress it makes over time in achieving its goals. In addition, PMS deals with the clarification of goals, the strategic alignment of people and processes, the monitoring of progress, and the management of consistent communication of job expectations and organisational culture to support the various transformational initiatives (Thomson, 1999). Some of these organisational objectives are not easily quantifiable, particularly when different levels of an organisation are involved. Hence, qualitative, nonfinancial, measures are more appropriate in investigating these key objectives that dominate and direct decision-making and action-taking levels (Thurbin, 1994, Yeo, 2003).
Furthermore, the rise of the knowledge-based economy has been attributed to the increasing importance of intellectual capital as an intangible and important resource for companies’ sustainable competitive advantage (Roos and Roos, 1997). Many researchers have recognised that intellectual capital, which consists of nonfinancial measures and other related information, drives the value of an enterprise (Moon and Kym, 2006). Intellectual capital can be defined as “knowledge, experience, expertise, and associated soft assets, rather than hard physical and financial capital” (Klein, 1998, p.1). While intellectual capital has captured the interest of many researchers, its evaluation is seen as problematic (Youndt and Snell, 2004). Measurement tools such as the balanced scorecard (BSC) or intellectual capital (IC) concepts have emerged in order to manage and evaluate intangible assets. These concepts measure not only financial performance but define non-financial performance indicators for measuring intangible assets and hence make it possible to align them with the organisation’s objective and measure their contribution to the organisation’s strategy (Kaplan and Norton, 2004).

Nonprofit organisations (where financial measurements are not always applicable) can benefit from the development of measurements such as the balanced scorecard or the intellectual capital concept. And in fact, the both concepts are already used by many nonprofit organisations in order to measure organisational performance.

While in practice, the concept of the balance scorecard is often applied in nonprofit organisations, Kong (2007) discourages the use of the balance scorecard for measuring organisational performance in nonprofit organisations. He believes that strategic management approaches that are based primarily on the notion of competition and customers are generally unacceptable to the nonprofit sector. Kong further argues that the cause-and-effect relationships among the four BSC elements (learning and growth, internal process, customer, financial performance) do not work in nonprofit organisations as the expectations and demands of various constituencies are often conflicting and even contradictory. Instead, he recommends following the intellectual capital approach because of its adaptability to the challenges posed by the nonprofit environment in the knowledge economy. In his view, theoretical roots of intellectual
capital which come from the internal focus associated with the core competence theory helps to shift strategic focus of nonprofit organisations to intellectual resources, including knowledge, skills and experience (Kong, 2007).

1.2 Research Objectives and Research Questions

In summary, this study focuses on nonprofit organisations and analyses what impact knowledge management might have on the organisational performance of these organisations.

The main objectives of this thesis are to identify the key elements of the KM infrastructure for nonprofit organisations, and to analyse the interdependence between these elements and their impact on KM processes. Furthermore, this thesis investigates the relationship between KM processes and organisational performance, defined through intellectual capital. Based on the literature, this thesis proposes a framework for the relationships between KM (infrastructure and processes) and its influence on OP (in the form of intellectual capital). The proposed framework is presented in Figure 1.2.

Figure 1.2: The KM/IC Model: Proposed framework for the relationships between KM Infrastructure, KM Processes and Organisational Performance
Former research suggests that organisational culture, organisational structure and IT support are the main factors influencing KM. Furthermore, previous research suggests that these factors are not independent. Based on these findings, the following research questions (RQ) are raised:

RQ 1: Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?

RQ 2: Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?

With IT support as the main instrument to influence KM further research questions about the relationship between IT support and the different components (human capital, structural capital and relational capital) of intellectual capital (IC) are posed:

RQ 3: Do nonprofit organisations which have a stronger IT support have a higher value of human capital than nonprofit organisations which have a less strong IT support?

RQ 4: Do nonprofit organisations which have a stronger IT support have a higher value of structural capital than nonprofit organisations which have a less strong IT support?

RQ 5: Do nonprofit organisations which have a stronger IT support have a higher value of relational capital than nonprofit organisations which have a less strong IT support?

The research questions are investigated through a case study based on two nonprofit organisations involved in trade promotion.

1.3 Importance of the Topic

This research is significant in several aspects and contributes to the literature both in terms of theory and practice. The importance of this study is based on the pressure nonprofit organisations are facing to enhance their performance and the lack of management concepts which are taking the special characteristics of nonprofit organisations into account.
Although the literature has documented positive relationships between knowledge management (KM) and organisational performance (OP), no empirical research exists specifically relating to the nonprofit sector. By investigating the impact of knowledge management on organisational performance, this thesis anticipates three contributions. First, this research examined the emerging field of knowledge management, which is yet limited to abstract concepts, ideas, frameworks and models in the context of nonprofit organisations. There is still a need for research to discover how knowledge management can support or hinder the efficient and effective management of nonprofit organisations and which impact knowledge management has on the organisational performance.

Second, the research proposes a model – based on a synthesis of existing literature and nonprofit practice - which aims to make theoretical contributions especially relevant to the nonprofit sector. As a result, this thesis strives to broaden the existing understanding of knowledge management and its relevance for the nonprofit sector from an academic view.

Third, because of the practical relevance of finding efficient solution of managing knowledge in nonprofit organisations, it is anticipated that results of this study could enhance understanding of the power of knowledge management and hence, could encourage managers of nonprofit organisations to consider a formal implementation of KM strategies in order to maximise organisational performance.

1.4 Framework for the Thesis
This study consists of six chapters: Introduction; Literature Review; Theory Development and Research Questions; Research Methodology, Data Collection and Data Analysis; Results; Discussion and Conclusion.

Chapter 1 provides a general introduction and background of the problem addressed by the research study. It includes the research objectives and key research questions that frame the investigation. Furthermore, it presents the academic research contribution to the body of knowledge.
Chapter 2 provides a literature review of the relevant areas addressed in this research including key definitions. It covers the main KM processes involved in knowledge management and identifies the main elements of the KM infrastructure which influence these processes. It gives a brief overview about organisational performance measurements and introduces the concept of intellectual capital. Furthermore, it analyses the impact of knowledge management on organisational performance.

Chapter 3 describes a theoretical framework of the relationship between KM infrastructure, KM processes and organisational performance. Based on this framework, five research questions are raised.

Chapter 4 explains the research design and methodology applied as well as the data collection and data analysis procedures. It provides a detailed description of the research instruments used and the development of the measurements for evaluation the different levels of IC (human capital, structural capital and relational capital).

Chapter 5 summarises the results of the data collected from the interviews, document research, and online survey. It further presents the results for the research questions.

Chapter 6 provides a discussion of the results of the research questions under investigation, limitations to this research and recommendations for further research. Furthermore, practical implications as a result of this study are given followed by the conclusion.
Chapter 2

Literature Review

The following chapter consists of five parts. The concept of knowledge, including the definitions of knowledge and the knowledge-based theory of the firm as well as reasons for managing knowledge, is introduced in part one. Part two gives an overview about knowledge management including a description of the main KM processes and the necessary KM infrastructure to support these processes. Part three describes measurement tools of organisational performance and introduces the concept of intellectual capital. In part four the relation between knowledge management and organisational performance is reviewed. At last, a summary about the findings of the Literature Review is given in part five.

Figure 2.1: Overview of Chapter 2

2.1 The Concept of Knowledge

The search for a definition for the term “knowledge” can be traced back to Aristotle’s distinction between “know-what” and “know-how”. Today, the knowledge movement is broad and highly diverse in terms of research interest, underlying disciplines, research methods, results and philosophical underpinnings (Foss, 2007). Furthermore, there appears to be a lack of a universal classification relating to knowledge, leading to significant debates and controversies (Tywoniak, 2007) and resulting in research gaps (Foss, 2007).
Terms like knowledge, intellectual capital, absorptive capacity, core competence and core capabilities are not clearly defined and are often used interchangeably in the literature (Crossan, Lane and White, 1999; Moon and Kym, 2006). The following chapter provides an overview of the various definitions and types of knowledge existing in the literature today.

2.1.1 Definitions of Knowledge and Types of Knowledge

The number of definitions of knowledge in the existing literature is manifold and include, for example:

- Knowledge represents the meaningful links people make in their minds between information and how it is used in a specific context (Dixon, 2000; Von Krogh, Roos, and Slocum, 1996)

- Knowledge can be understood as the result of what has been experienced through perception or generated through thinking and reasoning, and which has been stored in memory (Brauner and Becker, 2006).

- Knowledge reduces uncertainty by creating connections between information and context and gains justification through successful action, i.e. it is not enough to know what to do, the challenge is to know how to use knowledge to generate results (Tywoniak, 2007).

Different perspectives of knowledge

Overall, research reveals that different perspectives of the knowledge concept exist. These include a) the hierarchical view of data, information and knowledge; b) the operational levels of knowledge (know what, know how and know why); and c) the subjective and objective view of knowledge. These three perspectives will be explained further.

First, the hierarchical view of data, information and knowledge explains knowledge in relation to the concepts of data and information. Based on this view, data can be
understood as unrelated facts, not yet interpreted by a person, whereas information is conceived as data related to other data, thereby adapting meaning and being understandable (Davenport and Prusak, 1998; Davidson and Voss, 2002; Wickramasinghe and von Lubitz, 2007). When information is integrated into an existing knowledge base and stored in memory, it becomes knowledge that can be used for various purposes. Therefore, knowledge is built through a useful aggregation of information (Bellinger, Castro and Mills, 2004; Wickramasinghe and von Lubitz, 2007). As a result, it must be noted that data, information and knowledge are not interchangeable concepts (Davidson and Voss, 2002). A graphical description of the three knowledge-related concepts is shown in Figure 2.2.

Figure 2.2: The Hierarchical View of Data, Information and Knowledge (adapted from Davidson and Voss, 2002)

Alavi and Leidner (2001) add to this view and state that the key to effectively distinguishing between information and knowledge is not found in the content, structure, accuracy, or utility of the supposed information and knowledge, but in the fact that
knowledge is personalised information and is information possessed in the mind of individuals.

A second approach to defining the concept of knowledge has been taken by Quinn, Anderson and Finkelstein (1996). These authors break the concept down into *three operational levels of knowledge* (adapted from Davidson and Voss, 2002):

- ‘Know what’: also called the cognitive knowledge, this is the essential disciplinary knowledge achieved through training, studies, and formal qualifications.
- ‘Know how’: this is the level of practical application. It is where the learning achieved at the ‘know what’ level is translated into doing. It is also the area where most professional knowledge adds value in an organisation through the ability to translate theoretical knowledge into effective execution.
- ‘Know why’: also called ‘system understanding’, this is the ‘deep knowledge of the web of cause-and-effect relationships underlying a discipline. It allows professionals to move beyond the execution of tasks to solve larger and more complex problems and create new solutions to new problems.

Third, alternative perspectives of knowledge argue that knowledge can be seen as *subjective* or as *objective* (Sabherval and Becerra-Fernandez, 2003). From the objective stance, knowledge is considered as an object, which is independent of human perception, and exists in a variety of forms and locations (Hedlund, 1994). This perspective understands knowledge as something which can be stored and manipulated (Carlsson, El Sawy, Eriksson and Raven, 1996). On the other hand, other researchers (Boland and Tenkasi, 1995; Venzin, Von Krogh and Roos, 1998) view knowledge as subjective. This perspective contends that knowledge does not exist independent of human experience, but instead, develops through social creation of meanings and concepts, and therefore loses the universal, objective character (Venzin et al., 1998).

The subjective view implicates that knowledge should be considered to be exclusively bound to individuals; otherwise it should be seen as data and information (Brauner and Becker, 2006). As a result, knowledge is only embedded in the knowledge base of
individuals, while data and information on the other hand can be stored in external storages, such as databases, books, or the internet. This distinction is important because of the crucial differences in accessibility. While data and information can be made accessible for everybody and at any time, the subjective view implicates that knowledge is only accessible if the other individual possessing the knowledge is a) present and available, b) able, and c) willing to display its knowledge (Brauner and Becker, 2006).

Based on the different views of knowledge, different perceptions of knowledge management exist (Carlsson et al., 1996). If knowledge is viewed as an object, then knowledge management should focus on building and managing knowledge stocks (Alavi and Leidner, 2001). In contrast, if knowledge is viewed as a subject, knowledge management should focus on enhancing individual learning and understanding through the provision of information or should build core competencies, understanding the strategic advantages of know-how, and creating intellectual capital (Alavi and Leidner, 2001).

**Different classifications of knowledge**

Apart from the different perspectives of knowledge, further differences can be made when analysing the dimensions of knowledge. Knowledge which can be expressed in words and numbers only represents the tip of the iceberg of the entire body of possible knowledge (Polyani, 1966). Polyani (1966) classified human knowledge into two categories, namely *explicit* knowledge and *tacit* knowledge. Explicit or codified knowledge can be expressed in words and numbers and can be easily shared with others in a number of ways, including data, formulae, specifications, or manuals (Nonaka, 1991; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). On the other hand, tacit knowledge has personal qualities, is embedded in experience and laden with emotion, values and ideals which are difficult to formalise and share with others (Nonaka, 1991; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). According to Polanyi (1966), tacit knowledge is disorganised, informal, relatively inaccessible, and difficult to codify. It is generally embedded in complex social relationships and is only comprehensible and able to be internalised by experience; like watching someone playing chess and learning
their moves by watching what they physically do and then working out the mental processes that lead to the physical action (Polanyi, 1966).

The terms tacit and explicit have become accepted as ways of describing the nature of knowledge, i.e. the degree of codification (Foss, 2007) or embeddedness (Badaracco, 1991). While some researchers make a distinction between tacit and explicit knowledge, other researchers do not regard tacit and explicit knowledge as totally exclusive, but rather mutually complementary entities, and thus knowledge can be converted from one form into the other (Nonaka, 1994; Nonaka and Takeuchi, 1995; Tywoniak, 2007).

2.1.2 The Knowledge-based Theory of the Firm

The increasing interest in knowledge as the most valuable asset of companies (Drucker, 1994) led to the development of the knowledge-based theory of the firm. The central question in the theory of the firm is why firms differ (Nelson, 1991). Many explanations exist, depending on the theoretical background. The transaction cost theory for example explains firm differences due to the difficulty of transacting certain types of goods and services. The more recently developed resource-based view of the firm (Wernerfelt, 1984) explains firm differences by means of the cost of imitating or acquiring resources which give other firms a competitive advantage. The resource-based view argues that a firm’s advantage over its competitors originates from the use of valuable, hard-to-imitate and hard-to-substitute assets (Patton, 2007). Both theories explain firm differences as a result of the profit-maximising firm’s lack of the ability to imitate other companies which are more profitable than themselves (Nonaka, Von Krogh and Voelpel 2006).

The knowledge-based view of the firm (Grant, 1996b; Spender and Grant, 1996) was developed as an extension of the resource-based theory of the firm. It suggests that the primary reason for the existence of the firm is its superior ability to integrate multiple knowledge streams, for the application of existing knowledge to tasks as well as for the creation of new knowledge (Sabherwal and Becerra-Fernandez, 2003; Conner and Prahalad, 1996; Grant 1996a, 1996b; Kogut and Zander, 1992). Grant (1996a) argues that competitive advantage is based on the firms’ ability to integrate the individual’s
specialised knowledge. Furthermore, in seeking to explain why firms differ, the knowledge-based view of the firm also accounted for the empirical fact that profit is just one of a firm’s special purposes (Nonaka et al., 2006). Firms are social institutions that fulfil the needs and meet the many and diverse intentions of their managers, organisational members, customers, suppliers and other constituencies (Kogut and Zander, 1992; Prahalad and Hamel, 1990; Spender and Grant, 1996) – which makes the knowledge-based view of a firm especially interesting in context with the analysis of nonprofit organisations.

2.1.3 Reasons for managing Knowledge

While knowledge may be difficult to classify and understand, it undeniably has a critical impact on business outcomes (Soo, Devinney, Midgley and Deering, 2002). There are a number of reasons for managing knowledge and they include:

- Knowledge management is a strategic activity, ensuring that organisations have the knowledge to manage the things which they are responsible for in a rapidly changing environment. (Alvesson and Karreman, 2001).
- Knowledge flows and networks within organisations and between different organisations are the key elements in successful innovation processes (Manley and McFallan, 2002).
- Efficient knowledge management has a positive influence on organisational performance (Drucker, 1994).
- Knowledge management processes can diminish the loss of knowledge associated with a rapidly ageing workforce and other human resources related concerns such as attracting and retaining younger workers (Liebowitz, 2005).

While loosing knowledge due to leaving workforce is a problem which is not new for the nonprofit sector, improved efficiency and innovation are becoming more and more important for the nonprofit world (Jaskyte and Dressler, 2005; Jaskye and Lee, 2006;
McDonald, 2007). Today’s nonprofit organisations are commonly operating in a highly competitive environment that is characterised by increasing demand of services from the community, growing competition for contracts with the public and for-profit sector (Tuckmann, 1998; Ramia and Carney, 2003), declining volunteer support (Lyons, 2001) and a generally tighter government funding source (Craig et al., 2004). This pressure, demands that nonprofit organisations operate more like for-profit organisations, seeking competitive advantage through innovation and efficiency (Dart, 2004; Goerke, 2003, Jaskyte, 2004).

In summary, introduced different definitions of knowledge as well as different perspectives of the knowledge concept (hierarchical view of data, information and knowledge; the operational levels of knowledge: know what, know how and know why; and the differentiation between subjective and objective view of knowledge). Furthermore, the classification of knowledge into explicit and tacit knowledge was explained briefly. The rising awareness of knowledge as an important asset for the organisation led to the development of the knowledge-based theory of the firm. Based on this theory, profit is not the only purpose of a firm; rather firms are social institutions that fulfil the needs of their stakeholder. This assumption makes the knowledge-based view especially interesting in context with the analysis of nonprofit organisations.
2.2 Knowledge Management (KM)

While it is important to understand the potential distinction between concepts such as explicit versus tacit knowledge, subjective versus objective view, or the differences between data, information and knowledge, for the practice of managing knowledge, it is further important to understand the processes through which knowledge is created and applied (Grant, 1996a) as well as the organisation’s infrastructure which supports these processes (Walczack, 2005).

A review of the literature reveals that there are many different definitions for knowledge management, as there are for knowledge. In general, “knowledge management refers to identifying and leveraging the individual and collective knowledge in an organisation to support the organisation in becoming more competitive” (Carlsson, 2003 p.195).

2.2.1 KM Processes

Knowledge management concepts existing in the literature differ considerably in the terms of numbers and labelling of processes rather than the underlying KM concepts (Alavi and Leidner, 2001). It is subsequently important to review this literature. For example, Grant (2005) distinguishes between two key processes, namely the generation of new knowledge and the effective application of new and existing knowledge. From another perspective, Ruggles (1998) defines eight processes. There are many different approaches to label the KM processes and an overview about the different approaches is presented in Table 2.1.
Table 2.1: Overview about the different approaches to classify KM processes

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonaka and Takeuchi, 1995 Nonaka and Teece, 2001</td>
<td>• Creation; • Transmission; • Utilisation</td>
</tr>
<tr>
<td>Leonard, 1995</td>
<td>• Acquire; • Collaborate; • Integrate; • Experiment</td>
</tr>
<tr>
<td>DeLong, 1997</td>
<td>• Capture; • Transfer; • Use</td>
</tr>
<tr>
<td>Ruggles, 1998</td>
<td>• Generate; • Access (from external sources); • Facilitate (through culture and incentive); • Present (in documents, databases and software); • Embed (in processes, products, and/or services); • Use (in decision making); • Transfer (into other parts of the organisation); • Measure (the value of knowledge assets)</td>
</tr>
<tr>
<td>Skyrme and Aidon, 1998; Spender, 1996</td>
<td>• Create; • Transfer; • Use</td>
</tr>
<tr>
<td>Teece, 1998</td>
<td>• Create; • Transfer; • Assemble; • Integrate; • Exploit</td>
</tr>
<tr>
<td>Gold, Malholtra and Segars, 2001</td>
<td>• Acquisition; • Conversion; • Application; • Protection</td>
</tr>
<tr>
<td>Grant, 2005</td>
<td>• Generation; • Application</td>
</tr>
</tbody>
</table>

At large, most concepts are considering the four basic processes of creating, storing, sharing, and applying knowledge as the key processes (Alavi and Leidner, 2001). The four knowledge management processes are further explained in the next sections.
2.2.1.1 Knowledge Creation

The creation of knowledge is explained by different theories, which tend to approach the area of knowledge creation from either a technology perspective, including the knowledge discovery in databases process and data mining, or from a people perspective, including Nonaka’s Knowledge Spiral (Wickramasinghe, 2006).

**Technology-oriented approach to knowledge creation:** Knowledge discovery in databases (KDD) or data mining, focuses on how data is transformed into knowledge by identifying valid, novel, potentially useful, and ultimately understandable patterns in data (Wickramasinghe, 2006). KDD is primarily used on data sets for creating knowledge through model building, or by finding patterns and relationships in data using various techniques drawn from computer science, statistics, and mathematics (Wickramasinghe, 2006; Wickramasinghe and von Lubitz, 2007).

**People-oriented approach to knowledge creation:** The people-oriented approach to knowledge creation argues that knowledge can be only created by individuals (Wickramasinghe, 2006). The people-oriented perspective can be further divided into perspectives where knowledge is created only by individuals on one side and, on the other side, perspectives that knowledge can also be created by organisations. Many leading theorists in knowledge creation and management, and organisational learning assert that knowledge is created by individuals and cannot be created by organisations (Crossan et al., 1999; Grant, 1996b; Polanyi, 1966). Individuals acquire knowledge not only by actively creating and interpreting their experiences, but also through intuition (Crossan et al., 1999; Polanyi, 1966). Knowledge is always embedded in the context in which it is created and is an individual and social process. Others advocate for a shift away from the view that knowledge resides in individuals alone, toward the opinion that knowledge is embedded in groups or communities (Dixon, 2000; Tywoniak, 2007). The organisation consists of a set of relationships which create immediate knowledge connections. At the organisational level, for knowledge creation to occur, the organisation must support creative individuals and provide contexts for them in which to create knowledge (Hargadon, 2003; Nonaka and Takeuchi, 1995). Thus, organisational
knowledge creation is the process by which knowledge created by individuals is shared, and justified in the organisational setting (Nonaka and Takeuchi, 1995). As a result, knowledge creation involves a continual interplay between the tacit and explicit dimensions of knowledge and a growing spiral flow as knowledge moves through the individual, group and organisational levels. Four basic patterns of creating knowledge in organisations have been identified which form the basis of Nonaka’s Knowledge Spiral of knowledge creation (SECI model), namely socialisation, externalisation, combination and internalisation (Nonaka, 1991, 1994; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). The Knowledge Spiral is presented in Figure 2.3 and each of these basic patterns is discussed briefly in the following paragraphs.

Figure 2.3: The Knowledge Spiral of knowledge creation (Nonaka and Konno, 1998)

Socialisation happens when tacit knowledge is shared between individuals through joint activities in a shared context, such as being together, spending time and living in the same environment (Nonaka, 1994; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995): A person learns skills through observing or imitating another person and practice
(e.g. apprenticeship). As a result, tacit knowledge from one person increases the tacit knowledge of another person and is therefore never transformed into explicit knowledge.

**Externalisation** or articulation takes place when tacit and explicit knowledge interact. In this phase tacit knowledge is transformed in an explicit way, and therefore easily accessible to the organisation (Nonaka, 1994; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). The conversion of tacit to explicit knowledge uses metaphors, analogies, concepts, assumptions or models (Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995).

**Combination** refers to the creation of new explicit knowledge by merging, categorising, reclassifying, and synthesising explicit into more complex combinations of explicit knowledge (Nonaka and Konno, 1998). Examples of combination are articulations through ‘best practices’ or ‘lessons learned’. While explicit knowledge is repackaged through combination, it does not necessarily extend the knowledge of the organisation.

**Internalisation** relates to the dissemination of explicit knowledge which then is internalised by staff and increases their existing tacit knowledge (Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). This is characterised by “learning by doing” (Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). When this internalised knowledge is shared by most members of an organisation it becomes part of the organisational culture (Nonaka and Takeuchi, 1995).

Overall, the four patterns of knowledge creation are highly interdependent and all four of these patterns are involved in a dynamic interaction, which Nonaka (1991; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995) refers to as the spiral of knowledge.
2.2.1.2 Knowledge Storing

The second main KM process identified through the literature is knowledge storing. Research has shown that organisations not only create new knowledge but they also forget or lose track of the acquired knowledge (Argote, Beckmann and Epple, 1990, Darr, Argote and Epple, 1995). Therefore, effective ways to store and organise knowledge have to be found (Grant, 2005). Knowledge which is stored within the organisation is often referred to as ‘organisational memory’ (Stein and Zwass, 1995) and includes physical resources (like written documentation, structured information stored in electronic databases, codified human knowledge stored in expert systems, documented organisational procedures and processes) as well as non-physical sources (knowledge stored in the heads of the employees – also referred as individual memory) (Alavi and Leidner, 2001; Tan, Teo, Tan and Wei, 1999). Based on the discussion of the concept of knowledge it is evident that tacit knowledge can not be codified and stored in physical resources, it has to be transformed into explicit knowledge (Cuel, Bouquet, and Bonifacio, 2006). Explicit knowledge which is stored in physical resources is more likely to be permanent than knowledge which is stored in the minds of individuals (Helleloid and Simonin, 1994).

Organisational memory can have both positive and negative potential influences on behaviour and performance of an organisation (Alavi and Leidner, 2001). While on one side, organisational memory helps to avoid the waste of organisational resources in replicating previous work and diminishes the loss of tacit knowledge (Simon, 1991). It can, on the other side, lead to maintaining the status quo by reinforcing single loop learning (Argyis and Schoen, 1978) which leads to stable and consistent organisational cultures that are resistant to change (Alavi and Leidner, 2001). Simon (1991), therefore argues that while employee turnover has an impact on long-term organisational memory, the natural erosion of individual memory over time is not entirely a disadvantage particularly in a changing environment. It serves to support unlearning, removes outdated knowledge and therefore opens the way for new knowledge (Simon, 1991).
Further (and often overlooked) storages of organisational knowledge are external sources such as suppliers, consultants and contractors (Helleoid and Simon, 1994). The importance of external knowledge is well recognised (e.g. Cohen and Levinthal, 1990) and considering the growing interconnectivity of organisations worldwide, external knowledge becomes more and more important (Kraaijenbrink and Wijnhoven, 2006).

2.2.1.3 Knowledge Sharing
Along with knowledge creation and knowledge storing, knowledge sharing represents another important KM process which has been discussed extensively in the literature. It is not enough to create knowledge, there must be an intention to use and share it (Dixon, 2000; Macklup, 1980). Syed-Ikhsan and Rowland (2004) believe that knowledge transfer requires the willingness of a group or individual to work with others and share knowledge to their mutual benefit. Without sharing, it is almost impossible for knowledge to be transferred to another person or group. Knowledge transfer can only take place in an organisation where its employees display a high-level of co-operative behaviour (Goh, 2002). According to Davenport and Prusak (1998), knowledge transfer involves two actions which are a) the transmission (sending or presenting knowledge to a potential recipient) and b) the absorption by that person or group. They further stress that transmission and absorption together have no value unless they lead to some change in behaviour, or the development of some idea that leads to new behaviour (Davenport and Prusak, 1998).

Knowledge does not flow automatically through organisations. Indeed, people’s time and energy is limited and they will choose to do what will give them the best return given their scarce resources (Davenport and Prusak, 1998). Broad explanations about why individuals and organisations share knowledge are that knowledge sharing reduces uncertainty (Gulati and Gargiulo, 1999, Tywoniak, 2007), turns individual learning into organisational learning (Nonaka, 1994), prevents reinventing the wheel (Bender and Fish, 2000) or/and creates shared understanding (Nickerson and Zenger, 2004). Cross and Sproull (2004) found through their research that knowledge sharing is the result of
information search and problem solving in situations, where people must solve complex problems with short time horizons.

Research has found that in order to share knowledge with others, two knowledge sharing approaches are commonly used: codification and personalisation (Hansen, Nohria and Tierney, 1999) also referred to as repositories and networks (King, 2006).

**Codification perspective:** Codification strategy presumes that knowledge can be disconnected from its source (objective view of knowledge) and as such deals with the capture and storage of knowledge representations in electronic repositories/databases, independent of the individual that generated it. Repositories are databases of knowledge usually contributed by individuals, teams, or organisations for potential use by others. The electronic repositories/databases which contain organisational knowledge facilitate knowledge transfer among the organisational members. Benchmarking through best practice databases are a good example for an instrument used by companies following the codification strategy. Replicating best practice is a key knowledge issue, because it is about identifying, transferring and using knowledge about how to do things well (O'Dell and Grayson, 1998). Even before the rise of knowledge management, organisations used benchmarking of other organisations in their pursuit of knowledge and best practice (O'Dell and Grayson, 1998; O'Dell, Wiig and Odem, 1999). O’Dell and Grayson (1998) see internal benchmarking and the transfer of best practice as one of the most tangible manifestations of knowledge management (O'Dell & Grayson, 1998). On the other side, Szulanski (2000) argues that the complexity of knowledge, particularly tacit knowledge, poses the greatest barriers to best practice transfer.

**Personalisation perspective:** Personalisation strategy, on the other hand presumes that knowledge cannot be disconnected from its source (subjective view). Knowledge can be shared through person-to-person interactions or networks. Networks facilitate communication among team members or among groups of individuals who are not necessarily identified a priori. The interactions can be face-to-face with a shared context or mediated by technology as in email, instant messaging, text messaging,
videoconferencing, groupware, etc. While the role of technology in codification strategy is to capture the knowledge representation and store it in a computer, its role in personalisation strategy is to facilitate the communication of knowledge (Mueller-Prothmann, 2006). Given the growth of distributed work and global teams, personalisation through technology mediation is becoming increasingly important. Communication and collaborative tools and technologies are allowing temporarily and globally dispersed individuals to work together and to engage in knowledge sharing through interpersonal communication.

The shift from technical and technological process view (codified perspective) to a more social view (personalisation perspective), has given way to new approaches that examine social dimensions of knowledge creation, transfer, and management (Cross, Laseter, Parker and Velasquez, 2006; Mueller-Prothmann, 2006). Based on the idea that the majority of individual knowledge transfer does not follow formal hierarchies or processes, but instead are driven by personal and informal communications, a growing literature on related concepts of communities of practice (Brown and Duguid, 1991; Lesser and Storck, 2001; Wenger, 1999), communities of knowledge (Botkin, 1999; Lesser, Slusher and Fontaine, 2000), and knowledge networks (Collison and Gregson, 2003; Nohria and Eccles, 1992; Powell, 1998; Seufert, von Krogh and Bach, 1999) has emerged.

Gulati and Gargiulo (1999) suggest that membership in a networked community satisfies the need for knowledge as a way to help cope with environmental uncertainty. Other researchers have effectively concluded that organisations participating in networked community will realise superior economic gains from their increased access to knowledge relative to independent or non-aligned firms (Mueller-Prothmann, 2006).

Table 2.2 gives an overview about the distinctive characteristics of these two knowledge sharing perspectives as well as a short description of the medium used and the role of IT for both approaches.
Table 2.2: Characteristics of codified and personalised approach to knowledge sharing

<table>
<thead>
<tr>
<th></th>
<th>Codification Approach</th>
<th>Personalisation Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Codification strategy presumes that knowledge can be disconnected from its source.</td>
<td>Personalisation strategy presumes that knowledge cannot be disconnected from its source.</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Knowledge is stored or shared through electronic repositories/databases, independent of the individual that generated it. Repositories are databases of knowledge usually contributed by individuals, teams, organisations for potential use by others. The electronic repositories/databases which contain organisational knowledge facilitate Knowledge transfer among the organisational members</td>
<td>Knowledge can be shared through person-to-person interactions or networks. Networks facilitate communication among team members or among groups of individuals who are not necessarily identified a priori. The interactions can be face-to-face with a shared context or mediated by technology as in email, instant messaging, text messaging, videoconferencing, groupware, etc. Communication and collaborative tools and technologies are allowing temporarily and globally dispersed individuals to work together and to engage in knowledge sharing through interpersonal communication</td>
</tr>
<tr>
<td><strong>IT is used to …</strong></td>
<td>…capture the knowledge representation and store it in a computer</td>
<td>…facilitate the communication of knowledge.</td>
</tr>
</tbody>
</table>

2.2.1.4 Knowledge Application
The last of the four main KM processes identified through the literature and to be discussed is knowledge application. The assumption that the source of competitive advantage resides in the application of the knowledge rather than the knowledge itself, is an important aspect of the knowledge-based theory of the firm (Alavi and Leidner, 2001, Grant, 1996b). Grant (1996b) identifies three key mechanisms for the integration of knowledge in order to create organisational capability (Alavi and Leidner, 2001):

a) **Directives** refer to a specific set of rules, standards, procedures and instructions developed through the conversation of specialist’s tacit knowledge to explicit and integrated knowledge for efficient communication to non-specialists.
b) **Organisational routines** refer to the development of tasks performance and coordination patterns, interaction protocols, and process specifications that allow individuals to apply and integrate their specialised knowledge without the need to articulate and communicate what they know to others.

c) **Self-contained task teams** are formed for problem solving in situations in which task uncertainty and complexity prevent specifications of directives and organisational routines.

While knowledge creation, storage and transfer do not necessarily lead to enhanced organisational performance; effective knowledge application does because organisational performance often depends more on the ability to turn knowledge into effective action and less on knowledge itself (Alavi and Leidner, 2001).

### 2.2.2 KM Infrastructure

Knowledge management refers not only to managing the KM processes described in the previous sections, but also to managing and creating an organisational structure and culture that facilitates and encourages the creation, storing, sharing and application of knowledge that enables a corporate strategic advantage (Walczak, 2005). If organisations introduce a knowledge management initiative without having a managerial support structure in place, they will soon find that the investment in knowledge management does not produce the benefits they strived for (Goh, 2002; Nahm, Vonderembse and Koufteros, 2004; Swan, Newell and Robertson, 2000; Walczak, 2005; Zammuto, Gifford and Goodman, 2000).

Many researchers have proposed factors or organisational resources as preconditions to influence effective knowledge management and some of the findings in the literature are briefly explained next.

For example, Choi (2000) conducted an empirical study of factors affecting successful implementation of KM based on the survey responses of 217 participants from different sectors. The research concluded that top management leadership, fewer organisational
constraints, and information systems infrastructure were the top three critical success factors for KM to succeed. Based on a general survey of the knowledge management processes of 317 firms, and an in depth investigation of six firms, across of diverse range of industry sectors, Soo et al. (2002) were able to identify four main component of an organisation’s knowledge management system. These include a database subsystem, an organisational language subsystem, a networking subsystem and a transfer subsystem. If effectively managed the outcome of this combination of subsystems delivers greater innovation output because they facilitate knowledge creation, acquisition, transfer and utilisation across a complex network of relationships internal and external to the organisation (Soo et al., 2002). Baldanza and Stankosky (2001) postulated four key elements, namely leadership, organisational structure, technology and learning, as the foundational building block for long-term success of KM. From another perspective, Gold, Malthotra and Segars (2001) argue that three key infrastructures, technical, structural and cultural, enable maximization of social capital. The same KM infrastructure elements are used by Lee and Lee (2007) who add ‘people’ as a fourth KM infrastructure element to their model. Zaim et al. (2007) as well have technology, organisational culture and organisational structure as the main components for an effective and efficient application of KM and add ‘intellectual capital’ as a fourth component. An overview of the literature surveyed and factors of the KM infrastructure recommended by researchers is presented in Table 2.3.

Out of the variety of factors for the KM infrastructure addressed in the literature, three main factors seem to be most important for the knowledge management support structure and can be found in almost all models: organisational culture, organisational structure, and IT support. The three factors will be explained in more detail in the following sections.
Table 2.3: Overview about KM infrastructure factors suggested for effective KM

<table>
<thead>
<tr>
<th>Researcher</th>
<th>KM infrastructure factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Electronic repositories of knowledge.</td>
</tr>
<tr>
<td></td>
<td>- Training, culture and leadership.</td>
</tr>
<tr>
<td></td>
<td>- Knowledge infrastructure.</td>
</tr>
<tr>
<td></td>
<td>- Leadership and strategic management commitment.</td>
</tr>
<tr>
<td></td>
<td>- Creating motivation to share.</td>
</tr>
<tr>
<td></td>
<td>- Culture.</td>
</tr>
<tr>
<td></td>
<td>- Technology.</td>
</tr>
<tr>
<td></td>
<td>- Training and learning.</td>
</tr>
<tr>
<td>Liebowitz (1999)</td>
<td>- Support from senior leadership.</td>
</tr>
<tr>
<td></td>
<td>- Chief Knowledge Officer.</td>
</tr>
<tr>
<td></td>
<td>- Knowledge repositories.</td>
</tr>
<tr>
<td></td>
<td>- KM systems and tools (Technology)</td>
</tr>
<tr>
<td></td>
<td>- Incentives to motivate people to share knowledge</td>
</tr>
<tr>
<td></td>
<td>- Supportive culture</td>
</tr>
<tr>
<td>Choi (2000)</td>
<td>- Employee training.</td>
</tr>
<tr>
<td></td>
<td>- Employee involvement and empowerment.</td>
</tr>
<tr>
<td></td>
<td>- Teamwork.</td>
</tr>
<tr>
<td></td>
<td>- Top-management leadership and commitment.</td>
</tr>
<tr>
<td></td>
<td>- Organisation constraints.</td>
</tr>
<tr>
<td></td>
<td>- Information systems infrastructure.</td>
</tr>
<tr>
<td>Gold et al. (2001)</td>
<td>- Technical infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Structural infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Cultural infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Organisational structure.</td>
</tr>
<tr>
<td></td>
<td>- Technology.</td>
</tr>
<tr>
<td></td>
<td>- Learning</td>
</tr>
<tr>
<td>Soo et al. (2002)</td>
<td>- Database subsystem.</td>
</tr>
<tr>
<td></td>
<td>- Organisational language subsystem.</td>
</tr>
<tr>
<td></td>
<td>- Networking subsystem.</td>
</tr>
<tr>
<td></td>
<td>- Transfer subsystem.</td>
</tr>
<tr>
<td>Lee and Lee (2006)</td>
<td>- People.</td>
</tr>
<tr>
<td></td>
<td>- Organisational Culture.</td>
</tr>
<tr>
<td></td>
<td>- Organisational Structure.</td>
</tr>
<tr>
<td></td>
<td>- IT Support</td>
</tr>
<tr>
<td>Zaim et al. (2007)</td>
<td>- Organisational Culture.</td>
</tr>
<tr>
<td></td>
<td>- Organisational Structure.</td>
</tr>
<tr>
<td></td>
<td>- Technology</td>
</tr>
<tr>
<td></td>
<td>- Intellectual Capital</td>
</tr>
</tbody>
</table>
2.2.2.1 Organisational Culture

Organisational culture can be defined as the shared, basic assumption that an organisation learnt while coping with the environment and solving problems of external adaption and internal integration that are taught to new members as the correct way to solve those problems (Park, Riebere and Schulte, 2004; Schein, 1985). Each organisation has a unique culture, which develops overtime to reflect the organisation’s identity in two dimensions: visible and invisible. The visible dimension of culture is reflected in the espoused values, philosophy and mission of the organisation. The invisible dimension reflects intangible aspects of organisational culture such as unspoken set of values and hypotheses that guide employees’ actions and perceptions in the organisation (McDermott and O’Dell, 2001).

A number of different models of organisational culture have been identified throughout the organisational literature. Broadly, these models are defined by their assessment of organisational norms or behavioural values (Rousseau, 1990). For instance, values oriented approaches to understanding organisational culture include the Organisational Beliefs Questionnaire which measures the employee’s beliefs about the organisation, workload and management and the Corporate Culture Survey (Glaser, 1983) which measures values, traditions, rituals and cultural networks. Cooke and Lafferty’s (1989) Organisational Culture Inventory (OCI) and Kilman and Saxton’s (1983) Cultural Gap Survey (CGS) are both based on behavioural norms or styles that identify shared beliefs and expectations that guide the way organisation members interact and approach their work. Another model, and the model adopted in the present study, is the Competing Values Framework (CVF) of organisational culture (Quinn and Rohrbaugh, 1983). The CVF emerged from studies of factors that account for highly effective organisational performance and was developed in response to the need for a broad applicable model that would foster successful leadership, improve organisational effectiveness, and promote value creation (Thakor, Cameron, DeGraff and Quinn, 2006). The first model developed by Quinn and Rohrbaugh (1993) has been modified over the last two decades and today it is used to explain the underlying relationships that reside in organisations, leadership, culture, decision making, motivation and more (Thakor et al., 2006).
The CVF is based on sets of primary and secondary dimensions derived from scholarly and managerial practice (Thakor et al., 2006). These dimensions represent contradictory approaches to value creation with the core vertical and horizontal dimensions generating four quadrants. Each quadrant categorises a collection of strategies, competencies, and perspectives that leaders and organisations use to encourage value creation (Thakor, et al., 2006). Previous research has confirmed that leaders and organisations are drawn towards one or more of these quadrants (Quinn and Cameron, 2006). As a result, organisations develop a dominant culture, a set of core competencies, and a strategic intent that are characterised by one or more of the quadrants (Thakor et al., 2006). The CVF can support organisations to diagnose and interpret these styles and inclinations and to utilise them in value creation activities (Thakor et al., 2006). The CVF, showing the four quadrants and its related culture and leadership types as well as the related value drivers and theories of effectiveness, is presented in Figure 2.4.

Figure 2.4: Competing Values Framework (CVF) (adapted from Thakor et al, 2006)
Cameron and Quinn (1999) used the CVF developed by Quinn and Rohrbaugh (1993) to introduce an Organisational Culture Assessment Instrument (OACI). The instrument assesses organisational culture in terms of four key factors. Each one of them is related to a set of core values, beliefs and assumptions that represent the different culture types within an organisation (see Table 2.4).

The core values of each of the four culture types defined by Cameron and Quinn (1999) are:

**Clan culture**: characterised as a family-type organisation. A clan culture is represented as a friendly place to work, where people share a lot of themselves. Leaders are viewed as mentors and facilitators. The glue of the organisation is loyalty and tradition, and a high level of commitment exists among members. Clan organisations emphasise individual development, morale, teamwork, participation, and consensus.

**Adhocracy culture**: is characterised as a dynamic, entrepreneurial, and creative organisation. Leadership is thought to be visionary, innovative, and risk oriented. A commitment to experimentation and innovation exist amongst members to place the organisation at the leading edge of new knowledge, products, or services. Emphasis is on rapid growth and acquisition of new resources, and success is based on products and services that are unique and original.

**Market culture**: includes organisations characterised by being result-oriented. Leaders are viewed as tough, demanding, hard-driving producers, and competitors. There is an emphasis on winning over the competition. The organisation is concerned with competitive actions and with achieving goals and target markets. Success is a matter of market share and penetration.

**Hierarchy culture**: is characterised by formal rules, structures, and policies. Procedures are the core precept in the organisation. Leaders are perceived to be effective if they are good coordinators and organisers. Stability, predictability, and efficiency are important for the organisation in the long run.
Table 2.4: Culture Types and associated core values (Cameron and Quinn, 1999)

<table>
<thead>
<tr>
<th>Culture Type</th>
<th>Core values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clan</strong></td>
<td>Trust</td>
</tr>
<tr>
<td>(Internal Focus/Flexible)</td>
<td>Respect for People</td>
</tr>
<tr>
<td></td>
<td>Honest Communication</td>
</tr>
<tr>
<td></td>
<td>Cohesive Relationships</td>
</tr>
<tr>
<td><strong>Adhocracy</strong></td>
<td>Innovation and Change</td>
</tr>
<tr>
<td>(External Focus/Flexible)</td>
<td>New Ideas</td>
</tr>
<tr>
<td></td>
<td>Visionary Thinking</td>
</tr>
<tr>
<td></td>
<td>Trying new Concepts</td>
</tr>
<tr>
<td><strong>Market</strong></td>
<td>Producing Results</td>
</tr>
<tr>
<td>(External Focus/Stable)</td>
<td>Getting the job done</td>
</tr>
<tr>
<td></td>
<td>Goal Attainment</td>
</tr>
<tr>
<td></td>
<td>Outcome Excellence</td>
</tr>
<tr>
<td><strong>Hierarchy</strong></td>
<td>Order</td>
</tr>
<tr>
<td>(Internal Focus/Stable)</td>
<td>Stability and Continuity</td>
</tr>
<tr>
<td></td>
<td>Analysis and Control</td>
</tr>
<tr>
<td></td>
<td>Predictable Outcomes</td>
</tr>
</tbody>
</table>

It is important to note, that organisations are seldom characterised by a single cultural type. Rather, organisations tend to develop a dominant organisational culture over time as the organisation adapts and responds to the challenges and changes in the environment (Schein, 1985).

It is interesting to note, that the characteristics of the four culture types described by Cameron and Quinn (1999) bare several similarities with the analytical framework to understand the various dimensions involved in nonprofit organisations described by Anheier (2000) which has been introduced in chapter 1 of this study.

**Relationship between Organisational Culture and KM Processes**

Despite the statement that organisational culture has been identified as the main obstacle to knowledge management (Ribiere and Sitar, 2003), very little is known about how organisational culture contributes to or impedes knowledge management (Gray and Densten, 2005).

Most research studies on the relationship between organisational culture and KM processes focus on the influence of organisational culture on knowledge sharing and
concentrate on single factors of organisational culture. For instance, factors such as trust among coworkers, interaction between staff, existence of reward systems and participative decision making have been shown to positively impact knowledge sharing (Al-Alawi et al., 2007). The impact of organisational culture on KM is also highlighted by Janz and Prasarnphanich’s (2003) theoretical model. The model explains the relationships between knowledge related activities and organisational and individual characteristics that promote the creation and dissemination of knowledge throughout an organisation. They argue that knowledge flow in an organisation depends on employees' trust in the organisation overall as well as in specific individuals. They suggest that organisations that provide a climate of trust built on culture encourage and provide incentives for sharing knowledge.

There is a lack of research investigating KM as a function of organisational culture (such as the CVF). Only one empirical research study could be found using the CVF for the research on the relationship between organisational culture and KM. Roman-Velazquez (2004) studied the organisational culture composition, based on the Competing Value Framework (CVF), and its relationship with knowledge management success and the approach for knowledge flow. The empirical study focused on government and nonprofit organisations and the results showed a positive and stronger relationship between personalisation approach for knowledge flow in organisations that have Clan or Adhocracy cultures and a codification approach for organisations that have Hierarchy or Market cultures (Roman-Velazquez, 2004). These findings are supported through Greiner, Boehmann and Krcmar’s (2007) case study researching 11 German and Swiss companies in respect to the relationship between business and knowledge management strategy. The paper shows that an organization whose business strategy requires process efficiency (which would represent organisations with a Hierarchy culture type within the CVF) should rely primarily on a codification strategy. An organization whose business strategy requires product/process innovation (which would represent organisations with an Adhocracy culture type within the CVF) should rely primarily on a personalization strategy.
An interesting model aligning the Competing Values Framework (CVF) developed by Cameron and Quinn (1999) with the Knowledge-Creation Spiral (SECI) developed by Nonaka and Takeuchi (1995) has been developed by Gray and Densten (2005). They suggest in their Organisational Knowledge Management Model, that each of the four culture types defined in the CVF is aligned with one of the different levels of knowledge creation (externalisation, socialisation, combination and internalisation) of the SECI Model. Gray and Densten (2005) propose the following relationships between organisational culture types and knowledge creation processes:

The Clan culture (CVF) emphasises the importance of managerial leadership behaviours that develop trust and belongingness to facilitate information sharing. Similarly, socialisation processes in the SECI model are necessary for tacit knowledge accumulation. Hence, both models recognise that even in companies with well-developed knowledge management infrastructure, people still need to turn to others to provide solutions to problems. The Adhocracy culture (CVF) characterised by flexibility, innovation, and creativity and based on the development of external relationships is congruent with the externalisation process involving the conversation of tacit to explicit knowledge (SECI model). The Market culture (CVF) is based on rational goals which emphasise competiveness, productivity, goal clarity, efficiency, and accomplishment. Similarly, Nonaka and Toyama (2003) refer to rationalism as an effective method to combine, edit and break down explicit knowledge in the combination level (SECI model) to operationalise organisational knowledge. The Hierarchy culture (CVF) focuses on the internal processes and emphasises information management, stability, routinisation, and control. The internal processes of the ‘professional bureaucracy’ (Quinn, Faerman, Thompson, and McGrath, 2003) are consistent with the internalisation mode in the SECI model.

In summary, literature relating to the relationship between organisational culture and KM processes is still scarce and focuses primarily on the impact of single factors of organisational culture on knowledge sharing. These results suggest that factors such as trust, reward systems, interaction between staff are positively related to knowledge
sharing. However, research focusing on the impact of organisational culture on other KM processes such as knowledge creation, knowledge storing or knowledge application is absent.

2.2.2.2 Organisational Structure

Another important element of the KM infrastructure is the organisational structure. Organisational structure is the formal system of task and authority relationships that control how people coordinate their actions and use resources to achieve organisational goals. Organisations can be structured on a continuum of being either totally centralised (managers at the top of the hierarchy have all power to make important decisions’ for the organisation) to totally decentralised (power of decision making is delegated to managers on lower levels) (Davidson and Griffin, 2006).

Each alternative has certain advantages and disadvantages, depending on the objectives of the organisation (Jones, 2007). An advantage of centralisation is that it lets top managers coordinate organisational activities and keep the organisation focused on its goals or mission. Centralisation, on the other hand, can be problematic when top managers become overloaded and immersed in operational decision. An advantage of decentralisation is that it promotes flexibility and responsiveness by allowing lower level managers to make on-the-spot decisions. The downside of decentralisation, however, is that if so much authority is delegated that managers at all levels can make their own decisions, planning and coordination become very difficult. In this regard, Anheier (2000) argues that many nonprofit organisations are facing a challenge in that they are subject to both centralising and decentralising tendencies. While some parts of the organisational task environment are best centralised, such as controlling or fund-raising; other parts of the organisational task environment could be either decentralised or centralised, depending on managerial preferences or the prevailing organisational culture; other parts, typically those involving greater uncertainty or ambiguity are best organised in a decentralised way (Anheier, 2000).
**Relationship between Organisational Structure and KM Processes**

The organisational structure has also been shown to influence KM processes. Previous research suggests that centralised structures discourage interdepartmental communication and frequent sharing of ideas due to time-consuming communication channels; it also causes distortion and discontinuousness of ideas (Stonehouse and Pemberton, 1999). Whereas, decentralised organisational structures have been found to facilitate an environment where employees participate in the knowledge building process more spontaneously. Recent researchers have found that a decentralised structure can have advantages in facilitating innovation and new knowledge creation, without the hindrance of a formal centralised hierarchy (Priestley, 2006). Further, Ichijo, Von Krogh and Nonaka (1998) highlighted that knowledge processes require flexibility and less emphasis on work rules. Therefore, there is evidence to suggest that increased flexibility in an organisational structure can result in activated knowledge management activities (Lee and Lee, 2007). On the other hand, there is evidence that the diffusion and implementation of existing knowledge is better supported through a centralised organisational structure (Adler, 2001; Galbraith and Merill, 1991; Van den Bosch, Volberda and De Boer, 1991; Volberda, 1998).

In summary, the literature found for research on the relationship between organisational structure and KM processes is still underdeveloped and focuses primarily on the impact of organisational structure on knowledge sharing. With the result that centralised structures on one side can hinder knowledge sharing and with it the creation of new knowledge due to time-consuming communication channels, but on the other side can support the diffusion of existing knowledge throughout the organisation. What is yet to be explored in research is the potential impact of organisational structure on KM processes.

**2.2.2.3 Information Technology (IT) Support**

Information Technology (IT) has been identified in the literature as another important element of the KM infrastructure. Information Technology (IT) comprises the resources used by an organisation to manage data, information and knowledge needed by the
organisation in order to carry out its mission. IT may consist of computers, computer networks and other pieces of hardware. It also consists of software that enables the system to manage and process data, information and knowledge in ways that are useful for the organisation (Davidson and Griffin, 2006).

The processes used to integrate IT as an institutional resource are likely to be shaped by institutional size, mission, financial resources, traditions, and organisational culture (Fedrick, 2001). Depending on which organisational culture is dominant, organisations may use IT for different purposes. The characteristics of different organisational cultures were already described in Chapter 2.2.2.1 based on the work of Cameron and Quinn (1999) and the classification of four organisational culture types within the Competing Values Framework.

The same framework was used by Cooper and Quinn (1993) to describe different management information systems (MIS) capabilities and technical characteristics (see Table 2.5). Cooper and Quinn (1993) used the framework of Quinn and Rohrbaugh (1983) which classifies the four quadrants as Human Relations (identical to Clan Culture by Cameron and Quinn, 1999), Open Systems (identical to Adhocratic culture by Cameron and Quinn, 1999), Rational Goal (identical to Market culture by Cameron and Quinn, 1999) and Internal Process (identical to Hierarchy culture by Cameron and Quinn, 1999). Cooper and Quinn (1993) then used the framework to map capability and technical characteristics to the Competing Values Framework, as described below.

- MIS are effective in the Human Relations quadrant to the extent that they support the promotion of employee dialogue, participation, and development.
- MIS are effective in the Open Systems quadrant to the extent that they support management in facilitating organisational insight, innovation, and adaption.
- MIS are effective in the Rational Goal quadrant to the extent that they support management in facilitating organisational planning, directing, and goal setting.
- MIS are effective in the Internal Process quadrant to the extent that they support management’s focus on measurement, documentation, and information management.
The capability and technical characteristics is summarised in Table 2.5. Based on this classification, effective IT approaches within Open Systems (or Adhocracy culture type in Cameron and Quinn’s (1999) model) are characterised through IT systems which are adaptive, flexible and allow ad-hoc usage. Effective IT approaches within Internal Processes (or Hierarchy culture type in Cameron and Quinn’s (1999) model) are characterised through IT systems which are formalised and stable and provide precise, reliable and detailed information.

Table 2.5: Competing Values Framework of MIS Capability and Technical Characteristics (adapted from Cooper and Quinn, 1993)

<table>
<thead>
<tr>
<th></th>
<th>System Capability Characteristic</th>
<th>System Technical Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Relations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Internal Focus/Flexible)</td>
<td>Computer aided instructing; interpersonal communicating and conferencing; group decision supporting</td>
<td>Easy to use and understand; challenging system; user controllable; personalised; good feedback provided; private information</td>
</tr>
<tr>
<td><strong>Open Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(External Focus/Flexible)</td>
<td>Environmental scanning; interorganisation linking; doubt and argument promoting</td>
<td>Adaptive, flexible; ad-hoc information content; ad-hoc system usage; systems differentiated among users; aggregated information</td>
</tr>
<tr>
<td><strong>Rational Goal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(External Focus/Stable)</td>
<td>Modelling; optimising, forecasting; sensitivity analysing</td>
<td>Integrated systems; systems with wide internal scope; high volume of information; efficient use of technology</td>
</tr>
<tr>
<td><strong>Internal Processes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Internal Focus/Stable)</td>
<td>Internal monitoring; internal controlling; record keeping</td>
<td>Precise, detailed information; reliable, failsafe systems; formalised systems; stable; specialised; standardised.</td>
</tr>
</tbody>
</table>

The CVF can therefore be used to characterise the two organisational phenomena organisational culture and IT which are in relation to each other. Table 2.6 describes the relation between organisational culture and IT in context of the CVF.
Table 2.6: Culture and IT paradigm cases in context of the Competing Values Framework (adapted from Hayden, 2006).

<table>
<thead>
<tr>
<th>Culture paradigm</th>
<th>IT paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameron and Quinn, 1999</td>
<td>Cooper and Quinn, 1993</td>
</tr>
<tr>
<td>Internal Focus/Flexible</td>
<td>Clan</td>
</tr>
<tr>
<td>External Focus/Flexible</td>
<td>Adhocracy</td>
</tr>
<tr>
<td>External Focus/Stable</td>
<td>Market</td>
</tr>
<tr>
<td>Internal Focus/Stable</td>
<td>Hierarchy</td>
</tr>
</tbody>
</table>

Further to the influence of organisational culture on the integration of IT as an institutional resource, IT seems to be influenced further by organisational structure: Schroeder and Pauleen’s (2007) previous research on knowledge management and IT governance suggest that the planning and coordination of such a network communication platform is easier in centralised organisations where organisational activities are organised by top management. These findings are supported by other researchers (Sambamurthy and Zmud, 1999; Weill, 2004; Schroeder and Pauleen, 2007). Overall, the literature provides evidence that the integration of IT systems as an institutional resource is influenced by organisational culture as well as by organisational structure.

**Relationship between IT and KM Processes**

Research has also demonstrated a relationship between IT and KM. For instance, many researchers have found that IT is a crucial element for efficient knowledge processes (Davenport and Prusak, 1998) for the following reasons: (a) IT facilitates rapid collection, storage and exchange of knowledge on a scale not practicable in the past; (b) a well-developed technology integrates fragmented flows of knowledge. This integration can eliminate barriers to communication among departments in an organisation. The influence of IT on different KM processes which have been already described in Chapter 2.2 are discussed.
IT and knowledge creation: Research has shown that information systems - designed to support collaboration, coordination and communication processes - can facilitate teamwork and thereby increase an individual’s contact with other individuals, which in turn can accelerate the growth of knowledge creation (Alavi and Leidner, 2001; Nonaka, 1994). Furthermore, intranets enable exposure to greater amounts of online organisational information horizontally and vertically. With the increased level of information exposure, individual can make observations and interpretations of information which might to lead to new individual tacit knowledge (Alavi and Leidner, 2001).

IT and knowledge sharing: IT can further support the knowledge management process of knowledge sharing by extending the individual’s reach beyond the formal communication lines. The search for knowledge sources is usually limited to immediate co-workers in regular and routine contact with the individual. However, individuals are unlikely to encounter new knowledge through their close-knit work networks because individuals in the same clique tend to posses similar information (Robertson, Swan and Newell, 1996). Thus, expanding the individual’s network to more extended, although perhaps weaker, connections is central to the knowledge diffusion process because such networks expose individuals to more new ideas (Robertson et al., 1996). Computer networks and electronic bulletin boards as well as discussion groups create a forum that facilitates contact between the person seeking knowledge and those who may have access to this knowledge.

IT and knowledge storing: Information and Communication systems for storing and organising explicit knowledge often are called knowledge management systems (KMS) or organisational memory systems/organisational memory information systems. Tools and technology in the form of KMS facilitate collaborative work and enable knowledge sharing, but only if they are actually used. Previous research in information systems suggests that individuals act in accordance to their beliefs about the availability and ease of use of the systems. Chennamaneni (2006) found through his empirical research that
tools and technology that are perceived to be highly available and ease to use positively influence knowledge sharing.

**IT and knowledge application:** IT can also have a positive influence on knowledge application by facilitating the capture, updating, and accessibility of organisational directives. For example, many organisations increase the accessibility and facilitate the maintenance of their directives (e.g. manuals, policies, and standards) by making them available on the website of the company. This increases the speed at which changes can be applied. Also organisational units can follow a faster learning curve by accessing the knowledge of other units that have gone through similar experiences. Moreover, by increasing the size of individual's internal social networks and by increasing the amount of organisational memory available, IT allow for organisational knowledge to be applied across time and space. Furthermore, IT can also enhance the speed of knowledge integration and application by codifying and automating organisational routines. Workflow automation systems are examples of IT applications that reduce the need for communication and coordination and enable more efficient use of organisational routines through timely and automatic routing of work-related documents, information, rules, and activities.

Overall, extensive research on the impact of IT support on the different KM processes can be found in the literature. An overview about the KM processes and the corresponding potential role for IT is presented in Table 2.7.
Table 2.7: KM processes and the potential role of IT (adapted from Alavi and Leidner, 2001)

<table>
<thead>
<tr>
<th>KM Processes</th>
<th>Supporting IT</th>
<th>IT Enables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Creation</td>
<td>Data mining, Learning tool</td>
<td>Combining new sources of knowledge, Just-in-time learning</td>
</tr>
<tr>
<td>Knowledge Storage/Retrieval</td>
<td>Electronic bulletin boards, Knowledge repositories, Databases</td>
<td>Support of individual and organisational memory, Inter-group knowledge access</td>
</tr>
<tr>
<td>Knowledge Transfer</td>
<td>Electronic bulletin boards, Discussion forums, Knowledge directories</td>
<td>More extensive internal network, More communication channels available, Faster access to knowledge sources</td>
</tr>
<tr>
<td>Knowledge Application</td>
<td>Expert systems, Workflow systems</td>
<td>Knowledge can be applied in many locations, More rapid application of new knowledge through workflow automation</td>
</tr>
</tbody>
</table>

In summary, chapter 2.2 – Knowledge Management – provided a brief overview about the recent literature with respect to the main KM processes (creation, storing, sharing and application) as well as an overview about the necessary KM infrastructure (organisational culture, organisational structure and IT support) to support these processes. In addition, research about the impact of the single factors of the KM infrastructure on the different KM processes was presented. In order to analyse the impact of KM on organisational performance (OP), the different measurements for OP will be described in the next chapter.

2.3 Organisational Performance (OP)

2.3.1 Financial and Non-financial Measures of OP

Traditional methods for measuring organisational performance were primarily concerned with accounting-based, financial measures which are quantifiable and could be used to support strategic planning and other management planning (Lehr and Rice, 2002). For profit-seeking organisations, the financial perspective provides a clear long-run objective, but it provides a constraint rather than an objective for nonprofits (Kaplan,
2001). But for-profit organisation researcher have also recognised that financial measures by themselves are inadequate for measuring and managing performance, since financial reports measure only past performance but communicate little about long-term value creation (Kaplan and Norton, 1996).

Since the late 1980s many organisations were beginning to recognise the value of nonfinancial measures such as customer and employee satisfaction. Such performance measures became just as important as the traditional measures of sales and profits (Lehr and Rice, 2002). Indeed, performance measurement concepts and models such as the balanced scorecard approach, intellectual capital approach, quality management and business process reengineering have extended the domain of measurement in order to quantify complex concepts as customer and employee satisfaction or process effectiveness (Kaplan and Norton, 1996).

However, nonprofit organisations still struggle with the question on what they should base their performance measurements. Kaplan (2001) suggests that success for nonprofits should be measured by how effectively and efficiently they meet the needs of their constituencies and recommend a modified balanced scorecard as the organisational performance measurement tool. Kong (2007), on the other hand, discourages the use of the balance scorecard for measuring organisational performance in nonprofit organisations. He believes strategic management approaches that are based primarily on the notion of competition and customers are generally unacceptable to the nonprofit sector (Kong, 2007). Furthermore, he argues that the cause-and-effect relationships among the four BSC elements (learning and growth, internal process, customer, financial performance) do not work in nonprofit organisations as the expectations and demands of various constituencies are often conflicting and even contradictory (Kong, 2007). Instead, he recommends following the intellectual capital (IC) approach because of its adaptability to the challenges posed by the nonprofit environment in the knowledge economy. In his view, theoretical roots of intellectual capital which come from the internal focus associated with the core competence theory helps to shift strategic focus of nonprofit organisations to intellectual resources, including knowledge,
skills and experience (Kong, 2007). The concept of IC will be explained in further detail in the next chapter.

2.3.2 The Concept of Intellectual Capital (IC)

One way to assess performance is via IC. Klein (1998, p.1) defines IC as “knowledge, experience, expertise, and associated soft assets, rather than their hard physical and financial capital”. Following the work of a number of scholars in the field of intellectual capital, it encompasses three primary interrelated non-financial components (Bontis, 1998): Human Capital, Structural Capital and Relational Capital. Each will be discussed in turn.

First, Human Capital includes various human resource elements like attitude, competencies, experience and skills, and knowledge (Guerrero, 2003; Roos and Jacobsen, 1999). It represents the tacit knowledge embedded in the minds of people in organisations (Bontis, 1998; Bontis, Crossan and Hulland, 2002). Human capital is important to organisations as a source of innovation and strategic renewal (Bontis, 1998; Bontis et al., 2002; Webster, 2000).

Second, Structural Capital refers to the learning and knowledge enacted in day-to-day activities. The pool of knowledge that remains in an organisation at the end of the day after individuals within the organisation have left represents the fundamental core of structural capital (Grasenick and Low, 2004). Structural capital becomes the supportive infrastructure for human capital. It includes all of the physical resources for knowledge storing in organisations – such as databases, process manuals, strategies, routines, publications and copyrights – which create value for organisations, thus adding to the organisations’ material value (Bontis, Chua and Richardson, 2000).

Third, Relational Capital characterises an organisation’s formal and informal relations with its external stakeholders and the perceptions that they hold about the organisation, as well as the exchange of knowledge between the organisation and its external stakeholders (Bontis, 1998; Fletcher, Guthrie, Steane, Roos and Pike, 2003; Grasenick
and Low, 2004). Relational capital is important to an organisation because it acts as a multiplying element creating value for the organisation by connecting human capital and structural capital with other external stakeholders (Ordonez de Pablos, 2004).

The three IC components (human capital, structural capital and relational capital) are interdependent (Subramaniam and Youndt, 2005; Youndt, Subramaniam and Snell, 2004). IC provides the best possible value to organisations through the combination, utilisation, interaction, alignment, and balancing of the three types of intellectual capital and as well as managing the knowledge flow between the three components. Whilst the IC perspective was first developed as a framework to analyse the contribution of intellectual resources in for-profit organisations Kong and Thompson (2006) argue that the IC concept is equally relevant to nonprofit organisations.

Although the importance of IC has become widely accepted in the last two decades (Serenko and Bontis, 2004), many organisations are still struggling with the application of the IC approach due to measurement difficulties (Dzinkowski, 2000; Nazari and Herremans, 2007). Several methods for the measurement and evaluation of IC have been developed over the past few years (Sveiby, 2007). Liebowitz and Suen (2000) provided a detailed list of measures used for IC and developed several new measures in order to integrate knowledge management and IC. The integration of KM and IC in order to maximise effectiveness is also supported by Zhou and Fink (2003) who explored the practices related to KM and IC amongst the top 300 companies listed in the Australian Stock Exchange. Since knowledge is part of the IC of an organisation, it is sometimes hard to clearly distinguish between the two concepts in the literature. However, it should be noted that KM is concerned with knowledge creation, storing, sharing and application processes and the organisational environment to facilitate these processes, while IC focuses on the value perspective of the organisation’s intellectual capital (Zhou and Fink, 2003).

One influential and recent model of IC was proposed by Moon and Kym (2006). They criticised that previous approaches on measuring IC had taken one of the two approaches:
a) proposing only specific valuation indices fitted for each global dimension without any subfactors; or b) suggesting subfactors for each dimension without offering measures of them (Moon and Kym, 2006). As a result, the combined the two approaches and proposed and assessed a model of IC that includes human-, structural- and relational capital defined by Bontis et al., (2000) and its key dimensions, along with the defining elements (subfactors) of each of these dimensions and their measurement indicators.

According to their model, the three dimensions (human, structural and relational capital) of IC can be further subdivided into subfactors. The dimension human capital has three subfactors: employee capability, employee satisfaction and employee sustainability. Structural capital comprise the subfactors culture, organisational process, information systems and intellectual property, while relational capital is divided into the three subfactors customer, partner and community (Moon and Kym, 2006) (see Figure 2.5).

For each subfactor a set of measurement indicators was identified like ‘employees level of knowledge of their work’ for the subfactor employee capability; ‘satisfaction level with job environment’ for the subfactor employee satisfaction; or ‘timeliness’, ‘usefulness’, ‘relevance’ for the subfactor information systems. In total 35 measurement indicators were identified for the ten different subfactors and tested for reliability and validity.
Figure 2.5: IC Classification Scheme (adapted from Moon and Kym, 2006)

The model, including the 35 measurement indicators, has been supported through empirical application by Moon and Kym (2006) amongst 50 manufacturing companies. As a result, they argue that their framework can be used to supply managers with a toolbox to help them to manage companies.

In summary, chapter 2.3 – Organisational Performance – provided a brief overview about the recent literature in respect to financial and nonfinancial measurements of Organisational Performance. The concept of IC was introduced as a nonfinancial measurement tool for evaluating organisational performance and the model of Moon and Kym (2006) for measuring IC in organisations was described. The following paragraph will provide an overview about the research on the impact of KM on OP.

2.4 Relationship between KM and OP
In the last years, different studies have addressed the issue of how knowledge management influences organisational performance and indicate that there is a positive

However, the role of knowledge management processes and infrastructure in regards to organisational performance is not consistent in the literature. Some studies have recognised both KM infrastructure and KM processes as antecedents for organisational performance (e.g. Gold et al., 2001). Gold et al. (2001) analysed the relation between KM process capabilities (acquisition, conversion, application, protection) and KM infrastructure capabilities (technology, structure and culture) and organisational effectiveness based on a survey among senior executives in the United States. Organisational effectiveness was measured through questions related to for example improved ability to innovate, rapid commercialisation of new products, responsiveness to market changes, and reduced redundancy of information/knowledge (Gold et al., 2001). Their results showed a positive influence of both KM processes and KM infrastructure on organisational effectiveness. Furthermore, the results of their research seemed to emphasise that both KM processes and KM infrastructure contributed uniquely to the achievement of organisational effectiveness and with that emphasises the importance of tightly aligned process and infrastructure capabilities. The model of Gold et al. (2001) is presented in Figure 2.6.
Other studies have recognised knowledge capabilities as preconditions of knowledge processes (Hansen, 1999; Lee and Lee, 2007; Szulanski, 1996). Lee and Lee (2007) analysed the influence of KM capabilities (infrastructure) and KM processes on organisational effectiveness within Korean companies of diverse sectors. They proposed and found that KM capabilities influence KM processes, and as a result, influence organisational effectiveness. More specifically, Lee and Lee (2007) included four KM capabilities into their research model: People (T-shaped skills: skills that are both deep and broad; people with T-shape skills are extremely valuable for creating knowledge), Structure (centralisation), Culture (learning) and Information Technology (IT support). They then analysed how these KM capabilities influenced the eight KM processes proposed by Ruggles (1998): a) generating knowledge; b) accessing valuable knowledge from external sources; c) facilitating knowledge growth through culture and incentive; d) presenting knowledge in documents, databases and software; e) embedding knowledge in processes, products, and/or services; f) using accessible knowledge in decision making; g) transferring knowledge into other parts of the organisation; and h) measuring the
value of knowledge assets/or impact of knowledge management. Finally, they measured the impact of the KM infrastructure and KM processes on KM performance through customer performance and financial performance in comparison to competition. The model of Lee and Lee (2007) is presented in Figure 2.7.

Figure 2.7: The relation between KM processes, KM capabilities and KM performance (adapted from Lee and Lee, 2007)

Lee and Lee’s (2007) research presents strong evidence regarding the relationships among capabilities (infrastructure), processes, and performance of knowledge management. They believe that their study strongly supports the notion that companies may possess a predisposition for successful knowledge management through the improvement of key capabilities and processes. These results imply that organisational structure (decentralisation), learning organisational culture, and IT support positively impacts key aspects of knowledge processes. Furthermore, these results suggest that process activation in generating, accessing, facilitating, representing, embedding, usage, transferring knowledge, and measuring knowledge assets form an operational perspective for the framework of knowledge combination and exchange that underlies the theory of knowledge integration is positively related to organisational performance (customer and financial perspectives) (Lee and Lee, 2007).
2.5 Summary of the Literature Review

The literature review provided an overview of the existing literature related to knowledge management and organisational performance as well as the relationship between these two concepts. Overall, this chapter has revised the concept of knowledge (part one); knowledge management KM (part two); organisational performance OP (part three); and the relationship between KM and OP (part four). Each concept is summarised below.

Main findings in respect to the concept of knowledge:

• Knowledge can viewed as either subjective (connected to the human experience) or as objective (as an object, disconnected from the human experience).
• Furthermore, it can be classified as either explicit (expressible in words/numbers) or as tacit (embedded in experience and not expressible in words/numbers).

Main findings in respect to the knowledge management:

• Knowledge Management is described as the management of the main KM processes supported by the KM infrastructure.
• Many different labels for classifying KM processes exist. The main KM processes identified in this study include: creation, storing, sharing, and application. Furthermore, knowledge can be created through technology or through people. Knowledge can be stored within the organisation (organisational memory) or can be found outside of the organisation (customers, suppliers, etc.). Knowledge can be shared through the codification approach (repositories) or through the personalisation approach (networks).
• There exist many different recommendations for factors of the KM infrastructure which have an impact on effective KM. The main factors of the KM infrastructure identified in this study include: organisational culture, organisational structure, and IT support. There seem to be evidence that especially the factor IT support is influenced by the other two factors organisational culture and organisational structure.
• There exist still many research gaps in respect to the influence of the factors of the KM infrastructure on the single KM processes. Only the influence of the factor IT support could be clearly linked to the different KM processes.

Main findings in respect to organisational performance (OP):
• OP can be evaluated through financial and nonfinancial measurements.
• Since intangible assets are becoming more and more important in today’s business world, nonfinancial measurement tools like the balanced scorecard or the intellectual capital concept are becoming increasingly popular.
• The balanced scorecard is seen as less suitable for nonprofit organisations, due to the following facts: the BSC is based primarily on the notion of competition and customer; the cause-and-effect relationships among the four BSC elements (learning and growth, internal process, customer, financial performance) do not work in nonprofit organisations as the expectations and demands of various constituencies are often conflicting and even contradictory.
• Therefore, the concept of IC seem to be a better fit to measure performance in nonprofit organisations and the concept of IC, including the three levels of human capital, structural capital and relational capital, was described in further detail. Additional, a framework including measurements for the different IC-levels was described.

Main findings in respect to the relation between KM and OP:
• Two conflicting views exist about the role of knowledge management processes and infrastructure in respect to organisational performance: some studies have recognised both KM infrastructure and KM processes separately as antecedents for OP while other studies argue that the KM infrastructure influences the KM processes which than have an impact on organisational performance.
Table 2.8: Overview about the main findings of the literature review

<table>
<thead>
<tr>
<th>The concept of knowledge</th>
<th>Different perspectives:</th>
<th>Objective vs. subjective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different dimensions:</td>
<td>Tacit vs. explicit</td>
<td></td>
</tr>
</tbody>
</table>

**KM processes**

<table>
<thead>
<tr>
<th>Creation:</th>
<th>Technology vs. people oriented (people oriented: individual vs. organisational knowledge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing:</td>
<td>Within the organisation and outside of the organisation; In physical resources (like databases) or in the heads of individuals</td>
</tr>
<tr>
<td>Sharing:</td>
<td>Codification (repositories) approach vs. personalisation (network) approach</td>
</tr>
<tr>
<td>Application</td>
<td>Directives, Organisational routines, self-contained task teams</td>
</tr>
</tbody>
</table>

**Organisational Culture**

| Clan, Adhocracy, Market and Hierarchy culture types |

**Organisational Structure**

| Centralised vs. decentralised |

**IT Support**

| IT support has an impact on all four KM processes (creation, storing, sharing and application) |

**Financial Measurements**

| Return on Investment, Profit, Sales, etc. |

**Nonfinancial Measurements**

| Balanced Scorecard, Intellectual Capital |

**KM infrastructure**

| KM infrastructure and KM processes have separate impact on OP |
| KM infrastructure has impact on KM processes |
| KM processes have impact on OP |

Based on the finding in the literature, in the next chapter a research model for this study will be developed and assumptions in respect to the relationship between KM processes, KM infrastructure and intellectual capital will be proposed.
Chapter 3

Theory Development and Research Questions

In the previous chapter, the justification for the research project was outlined in terms of the current literature on knowledge management and intellectual capital. The first part of this chapter develops the research model with reference to existing models in respect to the relation between KM infrastructure, KM processes and organisational performance. The second part of the chapter defines the research questions and part three summarises the research model and research questions.

3.1 Developing the Research Model

3.1.1 Identifying the KM Infrastructure

The framework for the proposed research model is based on the research studies by Gold et al. (2001) and Lee and Lee (2007), as well as Moon and Kym (2006).

The model of Gold et al. (2001) is based on three different factors for the KM infrastructure: technological, structural and cultural infrastructure. A similar classification is used by Lee and Lee (2007). As a result, the proposed research model
includes the three factors of the KM infrastructure which can be found in both models: organisational culture, organisational structure and IT support.

**Organisational Culture**

As explained in Section 2.4.1, “organisational culture refers to the taken-for-granted values, underlying assumptions, expectations, collective memories, and definition present in the organisation” (Cameron and Quinn, 1999). The proposed research model will investigate organisational culture using the Competing Value Framework (CVF) developed by Cameron and Quinn (1999). Based on the CVF organisations are classified by the four different culture types: Clan, Adhocracy, Market, and Hierarchy.

**Organisational Structure**

Organisations can be structured on a continuum of being either totally centralised (managers at the top of the hierarchy have all power to make ‘important decisions’ for the organisation) to totally decentralised (power of decision making is delegated to managers on lower levels) (Davidson and Griffin, 2006). This research study investigates nonprofit organisations which have subsidiaries in several countries and for that reason focuses on centralised/decentralised decision making in regards to the relation between the headquarter and the subsidiaries in different locations.

**IT Support**

IT is widely employed to connect people with reusable codified knowledge; it facilitates conversations to create new knowledge; and it allows an organisation to create, share, store and use knowledge (Raven and Prasser, 1996). Organisations can provide IT support on different levels. A strong IT support in this study is characterised by databases with high accessibility, easy to use, content in accordance to usefulness and relevance of information and knowledge stored in the databases.

Both, Gold et al. (2001) as well as Lee and Lee (2007) analysed the association between each factor of the KM infrastructure and either KM processes or organisational performance separately. In both studies, the authors do not consider any interdependence
between the different factors of the KM infrastructure. However, the findings of the literature review suggest that (especially) IT support seems to be strongly influenced by the other two factors. For instance, different organisational culture types make different use of IT systems (Cooper and Quinn, 1993) which should reflect on the level of IT support. Second, the planning and coordination of IT systems is handled differently in organisations with a centralised structure than in organisations with a decentralised structure (Schroeder and Pauleen, 2007) which also should reflect on the level of IT support. Therefore, it is reasonable to assume interdependence between the different factors of the KM infrastructure.

In summary, two assumptions are made in respect to KM infrastructure which are incorporated into the proposed model:

- Organisational culture, organisational structure and IT support are the main factors of the KM infrastructure to support effective KM.
- Interdependence exists between the different factors of the KM infrastructure: the factor IT support is influenced by the factors organisational culture and organisational structure.

3.1.2 Identifying the KM Processes

The model of Gold et al. (2001) is based on four different KM processes: acquisition, conversion, application, and protection. Further, Lee and Lee’s (2007) model is based on the eight different KM processes defined by Ruggles (1998): generate, access, facilitate, present, embed, use, transfer, and measure. Both approaches differ slightly but the main KM processes, namely creation, storing, sharing, and application (which has been explained in detail in section 2.2.1) can be identified within these two classifications. As a result, the proposed research model includes the four KM processes creation, storing, sharing, and application.

Furthermore, the review of the literature reveals that the main KM processes are influenced by the various factors of the KM infrastructure. For example, the research of Roman-Velasquez (2004) showed a relationship between organisational culture and the
different approaches (codification and personalisation) to share knowledge. The results demonstrated a positive and stronger relationship between a personalisation approach for knowledge sharing in organisations with Clan or Adhocracy cultures, and a codification approach for organisations with Market or Hierarchy cultures (Roman-Velasquez, 2004). Results of research in respect to the relationship between organisational structure and the various KM processes are not conclusive. While decentralised structures minimise communication barriers and provide the necessary flexibility for innovation and new knowledge creation on one side (Stonehouse and Pemberton, 1999, Priestley, 2006), other research show that the diffusion and implementation of existing knowledge seem to be better supported through a centralised organisational structure (Adler, 2001; Galbraith and Merill, 1991; Van den Bosch et. al, 1991; Volberda, 1998). Both factors - organisational culture and organisational structure - have been primarily researched in relation to the KM process of knowledge sharing only. In contrast, a strong endorsement that IT support has an impact on all four main KM processes has been found through the literature review (see section 2.2.2.3).

In summary, three assumptions are made in respect to KM processes which are incorporated into the proposed model:

- Knowledge creation, storing, sharing and application are the main theoretically informed processes of KM.
- KM processes are influenced by the different factors of the KM infrastructure (in line with an assumption in the Lee and Lee (2007) model).
- Each of the four different KM processes can be influenced by levels of IT support (which by itself is influenced by organisational culture and organisational structure) and therefore can be seen as the main factor of the KM infrastructure.
3.1.3 Identifying the Method for measuring OP

OP within the Gold et al. (2001) model is measured in form of organisational effectiveness, while Lee and Lee (2007) suggest measuring performance of the organisation through customer-rated performance and financial-related performance measures. Since both approaches have certain disadvantages for measuring performance in nonprofit organisations, this study follows the suggestion of Kong (2007) and uses the concept of IC to measure OP. IC encompasses three primary interrelated non-financial components (Bontis, 1998; Roos, Roos, Dragonetti and Edvinsson, 1997): Human Capital, Structural Capital and Relational Capital.

**Human Capital**

Human Capital is described by resources that are unique to the human being such as tacit knowledge, creativity, decisiveness, ability, attitude, and motivation. Kaplan and Norton (1996) have defined human capital by three subfactors: employee capability, employee satisfaction, and employee sustainability.

**Structural Capital**

Structural Capital is described by resources that the organisation has developed or procured and that the organisation legally owns but are not physical in nature (such as brands, image, reputation, routines, structures and information in databases or on paper). These resources create value for organisations, thus adding to the organisations’ material value (Bontis et al., 2000). Moon and Kym (2006) further conceptualise structural capital in terms of culture, organisational processes, information systems, and intellectual property rights. Since culture is already incorporated into the model as a factor of the KM infrastructure and intellectual property are playing a less important role for nonprofit organisations, only two of the subfactors of structural capital are included: organisational processes and information systems.

**Relational Capital**

Relational capital characterises the formal and informal relations of the organisation with its external stakeholders and the perceptions that they hold about the organisation,
as well as the exchange of knowledge between the organisation and its external stakeholders (Bontis, 1998; Fletcher et al., 2003; Grasenick and Low, 2004). Relational capital creates value for the organisation by connecting human capital and structural capital with other external stakeholders (Ordonez de Pablos, 2004). The proposed research model includes relationships to all relevant stakeholders who might be able to provide knowledge which is valuable for the organisation.

Furthermore, IC is described as knowledge stocks in different ontological levels: the individual level (human capital), the group level (relational capital) and the organisational level (structural capital) (Afiouni, 2007). In this sense, IC is generated through the KM processes creation, storing, sharing and application. And while KM and IC are two different concepts, they seem to overlap in certain aspects. Liebowitz and Suen (2000) recommend that new measurements for the evaluation of IC should be developed which are integrating IC and KM. They argue further, that even while measuring IC has become a growing area of interest in the knowledge management field, “one limitation of the current measures is that they do not necessarily address the ‘knowledge level’ and the types of value-added knowledge that individuals obtain” (Liebowitz and Suen, 2000 p.54).

In summary, two assumptions are made in respect to OP which are incorporated into the proposed model:

- The concept of IC can be applied for measuring organisational performance in nonprofit organisations.
- IC is generated through knowledge creation, storing, sharing and application which suggests an overlap of the two concepts KM and IC.

Incorporating these seven assumptions into a new model leads to the proposed research model which has been briefly introduced in chapter 1 and is presented in Figure 3.2.
3.2 Identifying the Research Questions

Based on the structural framework of the proposed research model, the relationship between the different factors of the KM infrastructure as well as the relationship between the two constructs KM infrastructure and IC is further analysed in the following sections and research questions are raised.

3.2.1 Relationship between KM Infrastructure Elements

Relation between Organisational Culture and IT Support

As discussed in Chapter 2.2.2.3, the process used to integrate IT as an institutional resource is likely to be shaped by institutional size, mission, financial resources, traditions, and organisational culture (Fedrick, 2001). Depending on which organisational culture is predominant, organisations may use IT for different purposes.
The Competing Value Framework (CVF) has been discussed in the literature review and can be used to describe different organisational culture types as well as the role of the corresponding IT systems. Based on the CVF, organisations which have a predominantly external focus and flexible control are described through an Adhocracy culture type and Open Systems management information system (Cooper and Quinn, 1993; Cameron and Quinn, 1999). Open Systems are characterised by less formalised, adaptive and flexible systems enabling ad-hoc usage and ad-hoc content (Cooper and Quinn, 1993). On the other side of the spectrum, organisations which have predominantly internal focus and stable control are described through a Hierarchy culture type and Internal Process management information system (Cooper and Quinn, 1993; Cameron and Quinn, 1999). Internal process systems are characterised by more formalised, structured, stable and specialised systems enabling routinisation and standardisation (Cooper and Quinn, 1993).

The literature review further revealed that organisations which represents predominantly the Adhocracy culture type, with a business strategy focus on innovation, prefer the personalisation approach (knowledge sharing through networks) in order to gain tacit knowledge (Greiner, Boehmann and Krcmar, 2007; Roman-Velasquez, 2004). On the other hand, organisations which represents predominantly the Hierarchy culture type, with a business strategy focus on efficiency, prefer the codification approach (knowledge sharing through repositories) in order to gain explicit knowledge (Greiner, Boehmann and Krcmar, 2007; Roman-Velasquez, 2004).

In this study, a strong IT support is characterised by databases (repositories) with high accessibility, easy to use, content in accordance to usefulness and relevance of information and knowledge stored in the databases. Organisations which share information through the codification approach are in need of a stronger IT support in respect to databases than organisations which share information through the personalisation approach. As a result, the following research question (RQ) will be investigated for the relation between organisational culture and IT support:
RQ 1: Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?

Relation between Organisational Structure and IT Support
Previous research on KM and IT governance has suggested that the planning and coordination of organisation-wide IT networks is easier in centralised organisations where organisational activities are organised by top management (Sambamurthy and Zmud, 1999; Weill, 2004; Schroeder and Pauleen, 2007). As a result, an organisation-wide IT network facilitates the accessibility for all employees to the databases provided by the organisation. Accessibility is one criterion to characterise the level of IT support (high accessibility suggests strong IT support). Hence, the following research questions will be investigated for the relation between organisational structure and IT support:

RQ 2: Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?

3.2.2 Relationship between IT Support and IC
3.2.2.1 Relationship between IT Support and Human Capital
Research has shown that human capital relates to all the resources embodied in individuals including for example attitude, competencies, experience, skills, and tacit knowledge, employed by or linked to the organisation in a way that makes it possible for the organisation to deploy these resources (Choo and Bontis, 2002, Kong, 2007). Kaplan and Norton (1996) have considered human capital as consisting of employee capability, employee satisfaction and employee sustainability.

Research has also shown that effective IT systems can increase employee satisfaction and employee capability (Huang, 1999; Hackler and Saxton, 2007). There has been no research of the direct impact of IT systems on employee sustainability. However, since employee sustainability is linked to employee satisfaction we can assume an indirect
impact. Therefore, the following research questions will investigate the impact of IT support on human capital.

**RQ 3**: Do nonprofit organisations which have a strong IT support have a higher value of human capital than nonprofit organisations which have a less strong IT support?

### 3.2.2.2 Relationship between IT Support and Structural Capital

Structural capital is described as the pool of knowledge that remains in an organisation at the end of the day after individuals within the organisation have left (Grasenick and Low, 2004). It becomes the supportive infrastructure for human capital and includes all of the non-human storehouses in organisations – such as databases, process manuals, strategies, routines, publications and copyrights – which create value for organisations, thus adding to the organisations’ material value (Bontis et al., 2000).

As discussed in the literature review, IT systems can play an important role with respect to storing and organising knowledge which exists in the minds of individuals (Davenport and Prusak, 1998). Hence, the following research question will investigate the impact of IT support on structural capital:

**RQ 4**: Do nonprofit organisations which have a strong IT support have a higher value of structural capital than nonprofit organisations which have a less strong IT support?

### 3.2.2.3 Relationship between IT Support and Relational Capital

Relational capital characterises an organisation’s formal and informal relations with its external stakeholders and the perceptions that they hold about the organisation, as well as the exchange of knowledge between the organisation and its external stakeholders (Bontis, 1998; Fletcher et al., 2003; Grasenick and Low, 2004). Relational capital creates value for the organisation by connecting human capital and structural capital with other external stakeholders (Ordonez de Pablos, 2004).
Research has shown that IT can further support the knowledge management process of knowledge sharing by extending the individual’s reach beyond the formal communication lines (Alavi and Leidner, 2001). Shared databases, computer networks and electronic bulletin boards as well as discussion groups create a platform that facilitates contact between the person seeking knowledge and those who may have access to this knowledge. Therefore, the following research question will investigate the impact of the level of IT support on relational capital.

**RQ 5:** Do nonprofit organisations which have a strong IT support have a higher value of relational capital than nonprofit organisations which have a less strong IT support?

### 3.3 Summary of Research Model and Research Questions

This chapter explained step by step the development of the proposed research model with respect to the relationship between KM infrastructure, KM processes and OP. By including the concept of IC as a measurement of OP, the former two constructs KM processes and OP were merged into one construct. This leads to a framework of a model which allows to evaluate OP (through KM processes and IC) of nonprofit organisations and to analyse the association between KM infrastructure and OP.

Five research questions regarding KM infrastructure (organisational culture, organisational structure, IT support) and IC (as a result of KM processes and described through Human Capital, Structural Capital and Relational Capital) have been posed:

- **RQ 1** Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?
- **RQ 2** Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?
- **RQ 3** Do nonprofit organisations which have a stronger IT support have a higher value of Human Capital than nonprofit organisations which have a less strong IT support?
RQ 4  Do nonprofit organisations which have a stronger IT support have a higher value of Structural Capital than nonprofit organisations which have a less strong IT support?

RQ 5  Do nonprofit organisations which have a stronger IT support have a higher value of Relational Capital than nonprofit organisations which have a less strong IT support?

The structural framework of the proposed research model as well as the corresponding research questions is presented in Figure 3.3.

Figure 3.3: Visual overview about the research questions
Chapter 4

Methodology, Data Collection and Data Analysis

This chapter is divided into four parts, starting with an explanation for the choice of the research method in Part one. Part two explains the research instruments used to collect the necessary data and the development of the measurements, followed by Part three which describes the data collection and Part four describing the data analysis procedures.

Figure 4.1: Overview of Chapter 4

4.1 Research Design, Method and Scope

4.1.1 Research Design

The first decision involved in choosing the research methodology for this project was linked to the sample. This study selected a case study research approach. Yin (1994) believes that the application of a case study approach is appropriate when the main purpose of the research project is exploratory. Using the case study approach, the researcher systematically gathers in-depth information on a single entity – an individual, group, organisation, or community – using a variety of data gathering methods. Furthermore, case studies can involve a textual analysis of similar situations in other organisations, in which the nature of the problem and the problem definition happen to be the same as the one experienced in the current situation (Cavana, Delahaye and Sekaran, 2001).
There are also limitations to be considered when using a case study research approach. The most common criticisms of the case study approach are that it is subjective and lacks statistical validity (Cavana et al., 2001). Another criticism of the case study approach is that it can only be used to investigate assumptions but generalisations cannot be drawn on the basis of the results (Yin, 1994). Therefore, the researcher is aware of the fact that by using a case study, the results of the investigation of the research questions can not be generalised and can only be used as a suggestion for further research studies.

4.1.2 Research Method

This study used a mixed method approach: both quantitative and qualitative methods. Qualitative research is concerned with understanding the processes, which underlie various behavioural patterns. It is more explanatory and usually needs a much smaller sample than quantitative research. According to Minichello and Huberman (1994), qualitative research attempts to capture people’s meanings, definitions, and descriptions of events. Additionally, Bonoma (1985), Lincoln and Guba (1985) and Neuman (1994) assert that a qualitative approach is more theory-building than theory-testing oriented. Qualitative research typically relies on one or more of four methods for gathering information: (1) participation in the setting, (2) direct observation, (3) in depth interviews, and (4) analysis of documents and materials.

In contrast, quantitative research aims to count and measure phenomena (Minichello and Huberman, 1994). The objective of quantitative research is to develop and employ mathematical models, theories and/or assumptions pertaining to natural phenomena. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships. It is most often conducted via a survey on a sample that must be representative of a population so that the results can be extrapolated to the entire population studied. It requires the development of standardised and codifiable measurement instruments (structured questionnaires).
Based on the different intentions of the two research methods, the researcher believed that this study had elements in it which asked for both methods. For the evaluation of the KM infrastructure, including organisational culture, organisational structure and IT support, a qualitative research method was selected for two reasons: First, the researcher was interested in the organisational culture, organisational structure and IT support for the organisation overall which seemed to be best discussed with representatives of the head office; second, it is often argued that for social topics (such as organisational culture) qualitative research seemed to be more appropriate (Mason, 2005). On the other hand, for the evaluation of IC a quantitative research method was chosen for two reasons: First, the researcher was interested in individual responses by the participants; second, the potential participants were located in geographically dispersed locations which seemed to be best covered through an online questionnaire. The main advantage of an online questionnaire is that a wide geographical area can be covered in a survey (Sekaran, 2000; Sue and Ritter, 2007).

Therefore, interviews and document research were chosen to perform the data gathering for the qualitative part of the research, and an online survey was selected for collecting the quantitative data of the research. The structure and the content of the research instruments are explained in detail in chapter 4.3.

4.1.3 Research Scope

Two different nonprofit organisations involved in international trade promotion were chosen in order to investigate the relationship between KM infrastructure and IC (as an instrument to measure OP) in nonprofit organisations and to investigate the research questions.

The organisations were chosen because the following characteristics of the organisations were observed by the researcher:

a) Both organisations had the same mission “to support the local business community exploring international markets”. Each organisation had a different historical background and developed a different organisational culture.
b) One of the organisations appeared of having a centralised organisational structure while the other had more a decentralised organisational structure.

The knowledge about the characteristics was further supported by internet research and informal discussions with managers of both organisations. Both organisations had their head office located in their home country and a network of between 25 and 79 local offices worldwide. The analysis focused on the knowledge sharing within and between the local offices, as well as with the head office, the funding organisation and other external stakeholders (related organisations).

4.2 Research Instruments

4.2.1 Selecting the Research Instruments

As mentioned previously, a case study method was chosen for this study. There are many qualitative and quantitative data collection methods available within the case study methodology. The methods related to this study are briefly described.

*Interviews*

Interviews are mainly used for gathering qualitative data and are often carried out to uncover rich and complex information from an individual. The face-to-face interactive process can, under the guidance of an experienced interviewer, encourage the interviewee to share intrinsic opinions and to dredge previously unthought-of memories from the unconscious mind (Cavana et al., 2001). How much interviewees are willing to disclose is often depending on the context of the interview (for example on the relation between the interviewer and the interviewee), but there are certain interview skills which will increase the likelihood that the interviewee will provide the desired information. According to Cavana et al. (2001), a well-designed interview is based on six factors: a) the pattern of the interview, b) listening, c) questioning, d) paraphrasing, e) probing, and f) Non-verbal behaviour. Interviews can be conducted face-to-face or by telephone and can be structured, semi-structured or unstructured. To minimise bias in responses, the interviewer must establish rapport with the respondents and as unbiased questions (Cavana et al., 2001).
**Surveys**

Survey methodology is a well-used methodology in many disciplines (e.g., organisational behaviour, marketing) and is considered to be an appropriate methodology if the research question lends itself to be tested with numerical representations (Cavana et al., 2001). Surveys generally enable the researcher to test a theory by collecting a possibly large number of observed responses in form of data, aggregating the data into scales, applying appropriate numerical formulas which lead to the conceptual formulation thus allowing the proposed relationship to be tested (Cavana et al., 2001). Furthermore, it enables the collection of information from wide sources which are located in various and remote locations (Sekaran, 2000). Especially online surveys are a good option if the sample size is widely distributed geographically (Sue and Ritter, 2007).

**Document Research**

Document research is another research approach to gather data and information without asking questions of respondents. Document research can be used to support information which has been already collected through other methods such as interviews or questionnaires (Cavana et al., 2001).

This study used interviews and document research in order to collect the qualitative data in respect to KM infrastructure, while an online survey was used to collect the quantitative data in respect to IC.

**4.2.2 Preparing the Interviews**

As the principal method to collect the data, a semi-structured interview questionnaire was designed by the researcher including the questions in respect to evaluate the organisational culture, the organisational structure and the level of IT support of the two participating organisations. The purpose of the interviews was to gather data and information about the KM Infrastructure (organisational culture, organisational structure and level of IT support).
Consistent with Cavana et al. (2001), a guide for the interviews was developed to ensure the quality and consistency of the discussion. This included:

- Thanking the interviewee for taking his/her time to participate in the interview
- Explaining the purpose of the research study and the interview
- Conducting the interview based on the semi-structured interview questionnaire
- Ensuring the interviewee had the opportunity to ask questions?
- Closing the interview by thanking the participant and asking if it would be possible to contact him/her again in case any further questions.

In order to investigate the research questions postulated in Chapter 3, measurement items for the construct KM infrastructure were defined. The three chosen factors of the KM infrastructure organisational culture, organisational structure and IT support are well established and validated constructs with measures adapted from previous research.

**Measurements for Organisational Culture**

Questions for the evaluation concerning the organisational culture were based on the Organisational Culture Assessment Instrument (OCAI) developed by Quinn and Cameron (1999), which has been described in section 2.4.1. The OACI assesses organisational culture in terms of four key factors. Each key factor is associated with a set of core values, beliefs, and assumptions that characterise the different culture types within the organisation. These core values, beliefs, and assumptions are also found in the KM literature and are important organisational traits for KM efforts in the nonprofit sector (Roman-Velazquez, 2004). The reliability and validity of the OACI had been tested in former research studies (Yeung, Brockbank and Ulrich, 1991; Quinn and Spreitzer, 1991) and OACI tool has been used to diagnose the culture in many organisations and found to be useful and accurate to measure the key dimensions of organisational culture (Velazquez, 2004; Quinn and Spreitzer, 1991, Cameron and Quinn, 1999, Quinn and Cameron, 2006).

The OACI is structured in six main sections (Quinn and Cameron, 2006): *Dominant Characteristics, Organisational Leadership, Management of Employees, Organisational*
Glue, Strategic Emphasis and Criteria of Success. Each section has four alternatives and the organisational culture is determined through assessment of the six items. Questions for organisational culture in this research were adapted from the OACI tool with the modification that the section Criteria of Success was not included due to its special focus on for-profit organisations. Questions for organisational culture are summarised in Table 4.1.

Table 4.1: Adaption of the OACI questions for Organisational Culture

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>OACI</td>
</tr>
<tr>
<td>Section</td>
</tr>
<tr>
<td>Dominant Characteristics</td>
</tr>
<tr>
<td>Organisational Leadership</td>
</tr>
<tr>
<td>Management of Employees</td>
</tr>
<tr>
<td>Organisational Glue</td>
</tr>
<tr>
<td>Strategic Emphasis</td>
</tr>
</tbody>
</table>

Measurements for Organisational Structure

Questions for the evaluation concerning the organisational structure are adapted from the research concluded by Lee and Lee (2007) with minor modifications. Instead of analysing centralised and decentralised decision making within an organisation which operates in only one location, this study focused on analysing centralised and decentralised decision making in regards to the relation between the local offices (worldwide) and the head office (in the home country). Therefore, measures on centralisation/decentralisation were based on the locus where the main decisions were made in the organisation and to whom and what has to be reported by the local offices. “Main decisions” involved decisions to be made regarding budgeting, staffing, overall strategy, and IT structure. Questions used to measure organisational structure are summarised in Table 4.2.
### Table 4.2: Adaption of the Lee and Lee (2007) questions for Organisational Structure

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lee and Lee (2007) Research Model</strong></td>
</tr>
<tr>
<td>Research method: Survey</td>
</tr>
<tr>
<td>Participants were asked several questions about the decision making process with the following potential replies:</td>
</tr>
<tr>
<td>…can take action without a supervisor</td>
</tr>
<tr>
<td>…are encouraged to make their own decisions</td>
</tr>
<tr>
<td>…do not need to refer to someone else</td>
</tr>
<tr>
<td>…do not need to ask their supervisor before action (R)</td>
</tr>
<tr>
<td>…can make decisions without approval</td>
</tr>
</tbody>
</table>

### Measurements for IT Support

Questions for the evaluation of the IT support are adapted from the research model conducted by Lee and Lee (2007) and are described in Table 4.3.

### Table 4.3: Adaption of the Lee and Lee (2007) questions for IT Support

<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lee and Lee (2007) Research Model:</strong></td>
</tr>
<tr>
<td>Research method: Survey</td>
</tr>
<tr>
<td>Participants were asked several questions about the IT support with the following potential replies:</td>
</tr>
<tr>
<td>…provides IT support for information sharing</td>
</tr>
<tr>
<td>…provides IT support for information acquisition</td>
</tr>
<tr>
<td>…provides IT support for knowledge acquisition</td>
</tr>
<tr>
<td>…provides IT support for knowledge finding and accessing</td>
</tr>
<tr>
<td>…provides IT support for customer information gathering</td>
</tr>
</tbody>
</table>
**Summary of the Measurements for KM Infrastructure**

In total, four questions were used in order to evaluate organisational culture, three questions for evaluating organisational structure and five questions for evaluating IT support. An overview about all questions for the KM Infrastructure construct can be found in Table 4.4.

Table 4.4: Overview of questions in respect to KM Infrastructure

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Variable name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational Culture</td>
<td>How could the overall organisational culture be described? How could leadership in the organisation be described? How could the management style in the organisation be described? What holds the organisation together? What is the strategic emphasis of the organisation?</td>
<td>OC</td>
</tr>
<tr>
<td>Organisational Structure</td>
<td>How are decisions made in the local offices? Which decisions are made by the local offices, which have to be consulted with the head office? Does the local office need to refer to another party when making decisions?</td>
<td>OS</td>
</tr>
<tr>
<td>IT Support</td>
<td>Does the organisation provide IT support for information and knowledge creating, storing, sharing and acquisition? In addition: the existing databases were evaluated based on richness and usefulness of the content and accessibility</td>
<td>IS</td>
</tr>
</tbody>
</table>

These questions were then used in the semi-structured interview in order to evaluate the KM Infrastructure (organisational culture, organisational structure and level of IT support) of the two participating organisations.
4.2.3 Preparing the Online Survey

An online survey was used as the main research instrument to collect the required data for the evaluation of the intellectual capital. A draft for the online survey was designed by the researcher including the questions which were developed for the measurement items of the Intellectual Capital constructs and explained in chapter 4.2.2. The draft was then discussed with several researcher of the Australian Centre for Philanthropy and Nonprofit Studies at the Queensland University of Technology (QUT) in order to confirm that questions were in logical order and easy to understand.

In order to evaluate the intellectual capital (IC), measurements for the three levels of IC had to be defined.

**Measurements for Human Capital**

Based on the categorisation by Kaplan and Norton (1996), human capital can be described through three subfactors: employee capability, employee satisfaction, and employee sustainability.

**Employee capability** includes individual competencies, soft skills, and an individuals’ investment in their human capital (Dulewicz and Herbert, 1999; Mayo, 2000). Several methods to measure employee capabilities already exist and include for example items such as *managers with advanced degrees* (Edvinsson and Malone, 1997) or *education* and *work-related knowledge* (Brooking, 1996). In this study, employee capabilities were measured via their perception of how well participants were aware of the knowledge they needed to fulfil their job effectively and if they always had full access to the knowledge needed to fulfil their job effectively.

**Employee satisfaction** refers primarily to an employees’ emotional or affective state. An employee’s overall satisfaction is related positively to job satisfaction reflecting the difference between what the employees’ want from their job and what they perceive it is offering (Moon and Kym, 2006; Locke, 1976). In this study, employee satisfaction in the context of KM was measured through their own assessment of how satisfied they were
with the sources for knowledge creation provided by the organisation as well as how satisfied the employees were with the training opportunities provided by the organisation in order to enhance knowledge creation.

**Employee sustainability** refers primarily to retention of employees. Voluntary turnover can threaten the livelihood of an organisation as accumulated organisational knowledge is lost as organisational members leave (Bontis and Fitzens, 2002). In this study, employee sustainability is measured through the length of the time worked in the organisation in relation to the length of time of their total working experience. The measure items for human capital are summarised in Table 4.5.

Table 4.5: Overview of Item Measures of Human Capital

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Variable name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employee capability</strong></td>
<td>Participants were asked if they …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… are fully aware of the information/knowledge needed to fulfil their job effectively</td>
<td>HC/EC1</td>
</tr>
<tr>
<td></td>
<td>…always have full access to the information/knowledge needed to fulfil their job effectively</td>
<td>HC/EC2</td>
</tr>
<tr>
<td><strong>Employee satisfaction</strong></td>
<td>Participants were asked if the organisation …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>…always provides the necessary sources (internet, publications, colleagues, etc.) to create the knowledge they need to fulfil their job effectively</td>
<td>HC/ES1</td>
</tr>
<tr>
<td></td>
<td>…provides opportunities on a regular basis to attend <strong>internal</strong> training to enhance knowledge creation</td>
<td>HC/ES2</td>
</tr>
<tr>
<td></td>
<td>…provides opportunities on a regular basis to attend <strong>external</strong> training to enhance knowledge creation</td>
<td>HC/ES3</td>
</tr>
<tr>
<td><strong>Employee sustainability</strong></td>
<td>Relation between participants total years of work experience and the length of time working for the organisation</td>
<td>HC/ESu1</td>
</tr>
</tbody>
</table>
Measurements for Structural Capital

Based on the categorisation by Moon and Kym (2006), structural capital can be described through organisational processes and information systems.

Organisational processes refer to how people actually use the information or knowledge resources available to them in the workplace. As discussed in section 2.2.1.3, knowledge can be shared through either a personalised approach (person-to-person) or a codified approach (through repositories). Only codified knowledge, which is captured in databases and not in the minds of the employees, is part of the structural capital of an organisation. In this study, organisational processes were measured through the level of codified knowledge sharing in comparison to the level of personalised knowledge sharing as well as through the importance of their own database as a source for knowledge creation.

Information systems refer to information technology used in managing knowledge. Information systems facilitate collaborative work and enable knowledge sharing, but only if they are used. Therefore, in this study, information systems were measured through the usage rate of the organisations’ own databases. The items used for structural capital are summarised in Table 4.6.

Table 4.6: Overview of Item Measures of Structural Capital

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Variable name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational Processes</td>
<td>Participants were asked …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>…which approach (codified or personalised) they used for knowledge sharing</td>
<td>SC/OP1</td>
</tr>
<tr>
<td></td>
<td>…which are their three most important sources for creating new knowledge</td>
<td>SC/OP2</td>
</tr>
<tr>
<td>IT Systems</td>
<td>Participants were asked if…</td>
<td></td>
</tr>
<tr>
<td></td>
<td>…they used their information database regularly</td>
<td>SC/ITS1</td>
</tr>
<tr>
<td></td>
<td>…they used their knowledge database regularly</td>
<td>SC/ITS2</td>
</tr>
</tbody>
</table>
**Measurements for Relational Capital**

Relational Capital is described through the relation to all stakeholders that influence the operations of the organisation be they customers, suppliers, donors or local government and pressure groups.

Various measurements for relational capital can be found in former research. Bontis et al. (2000), for example, measured the *customer satisfaction*, *market share* and *longevity of relationships*, while Brooking (1996) measured relational capital through *brands*, *customer loyalty* and *distribution channels*.

This study focused on relations of the local offices with other stakeholders who might hold information and knowledge which might be valuable for the local offices. Therefore, relational capital was measured through the level of knowledge sharing with the main stakeholders (colleagues in other local offices, staff from the head office, staff from the funding organisation and staff from other related organisations). The items for relational capital are summarised in Table 4.7.

Table 4.7: Overview of Item Measures of Relational Capital

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Variable name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relation to Stakeholders</td>
<td>Participants were asked if they shared information/knowledge regularly with…</td>
<td></td>
</tr>
<tr>
<td></td>
<td>….colleagues in other local offices</td>
<td>RC1</td>
</tr>
<tr>
<td></td>
<td>….staff of the head office</td>
<td>RC2</td>
</tr>
<tr>
<td></td>
<td>….staff of the funding organisation</td>
<td>RC3</td>
</tr>
<tr>
<td></td>
<td>….staff of other related organisations</td>
<td>RC4</td>
</tr>
</tbody>
</table>
**Summary of the Measurements for IC**

In total, six items were used in order to evaluate human capital, four items for evaluating structural capital and four items for evaluating relational capital. An overview about all measure items for the IC construct can be found in Table 4.8.

Table 4.8: Overview of Item Measures in respect to IC

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Capital</td>
<td>Name of the question</td>
<td></td>
</tr>
<tr>
<td>Employee capability</td>
<td>Participants were asked if they …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… are fully aware of the information/knowledge needed to fulfil their job effectively</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… are always aware of the information/knowledge needed to fulfil their job effectively</td>
<td>HC/EC1</td>
</tr>
<tr>
<td></td>
<td>… are always have full access to the information/knowledge needed to fulfil their job effectively</td>
<td>HC/EC2</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>Participants were asked if the organisation …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… are always provides the necessary sources (internet, publications, colleagues, etc.) to create the knowledge they need to fulfil their job effectively</td>
<td>HC/ES1</td>
</tr>
<tr>
<td></td>
<td>… are always provides opportunities on a regular basis to attend internal training to enhance knowledge creation</td>
<td>HC/ES2</td>
</tr>
<tr>
<td></td>
<td>… are always provides opportunities on a regular basis to attend external training to enhance knowledge creation</td>
<td>HC/ES3</td>
</tr>
<tr>
<td>Employee sustainability</td>
<td>Relation between participants total years of work experience and the length of time working for the organisation</td>
<td>HC/ESu1</td>
</tr>
<tr>
<td>Structural Capital</td>
<td>Name of the question</td>
<td></td>
</tr>
<tr>
<td>Organisational Processes</td>
<td>Participants were asked …</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… which approach (codified or personalised) they used for knowledge sharing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… which are their three most important sources for creating new knowledge</td>
<td></td>
</tr>
<tr>
<td>IT Systems</td>
<td>Participants were asked if…</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… they used their information database regularly</td>
<td>SC/ITS1</td>
</tr>
<tr>
<td></td>
<td>… they used their knowledge database regularly</td>
<td>SC/ITS2</td>
</tr>
<tr>
<td>Relational Capital</td>
<td>Name of the question</td>
<td></td>
</tr>
<tr>
<td>Relation to Stakeholders</td>
<td>Participants were asked if they shared information/knowledge with…</td>
<td></td>
</tr>
<tr>
<td></td>
<td>… colleagues in other local offices</td>
<td>RC1</td>
</tr>
<tr>
<td></td>
<td>… staff of the head office</td>
<td>RC2</td>
</tr>
<tr>
<td></td>
<td>… staff of the funding organisation</td>
<td>RC3</td>
</tr>
<tr>
<td></td>
<td>… staff of other related organisations</td>
<td>RC4</td>
</tr>
</tbody>
</table>
Overall, the questionnaire comprised five sections: A) General Knowledge Management, B) Knowledge Needs, C) Knowledge Creation, D) Knowledge Sharing and E) Personal Background. The complete research instrument, including the invitation to participate in the research, can be found in Appendix B – Research Survey. The survey is briefly summarised.

Section A: General Knowledge Management
The first section of the survey included questions about the existence of information and knowledge databases, as well as level of use and access to these databases. It also included questions about responsibility for knowledge management within the organisation.

Responses were determined through either “yes”, “no”, “not sure” or through a given choice of possibilities for who might have access to the databases or should be responsible for knowledge management.

The responses provided an understanding of whether the difference between knowledge and information was understood by the participants and if the databases were seen as useful for the participants. In addition, it showed with whom they potentially could share information and knowledge and whom they believed should be responsible for knowledge management.

This section was used to collect data in regards to item measures SC/ITS1 (usage rate of information database) and SC/ITS2 (usage rate of knowledge database).

Section B: Knowledge Needs
The second section of the survey was developed in order to make statements about the employee capabilities. Participants were asked if they are fully aware of the information/knowledge needed to fulfil their job effectively, and if they had full access to the information/knowledge needed to fulfil their job effectively.
The participants responded based on a 5-point Likert scale ranging from (1) “strongly agree”, (2) “agree”, (3) “not sure” to (4) “disagree” and (5) “strongly disagree”.

Through the questions in this section, data in respect to the item measures HC/EC1 (awareness of participants own knowledge) and HC/EC2 (accessibility of the knowledge needed) were collected.

**Section C: Knowledge Creation**

The third section was developed in order to make statements about employee satisfaction with the sources for knowledge creation provided by the organisation as well as to make statements about employee satisfaction with the training opportunities provided by the organisation. Participants were asked if the organisation always provided the necessary sources to create knowledge needed to fulfil the job effectively or if the organisation provided opportunities on a regular basis to attend training (internal and external) to enhance knowledge creation.

Participants rated their answers based on a 5-point Likert scale ranging from “strongly agree”, “agree”, “not sure” to “disagree” and “strongly disagree”.

The last question of this section was developed to make statements about the sources used most for creating knowledge. The responses to this question were determined through a given choice of possibilities. This question was developed in order to measure the importance of the organisations’ own database as a source for knowledge creation.

This section collected data for item measures HC/ES1 (participant’s satisfaction with knowledge creating sources provided by the organisation), HC/ES2 and HC/ES3 (participant’s satisfaction with internal and external training opportunities provided by the organisation in order to create new knowledge) as well as SC/OP2 (importance of the own database for creating new knowledge).
Section D: Knowledge Sharing

The fourth section was structured to investigate how information and knowledge was shared (personalised of codified approach) as well as with whom the participants shared information and knowledge.

The response to the question if information and knowledge was shared on a regular basis with various others had to be given on a 5-point Likert scale ranging from “strongly agree”, “agree”, “not sure” to “disagree” and “strongly disagree”. Questions regarding how the knowledge was shared were determined through the choices “automated processes/databases” and/or “personal ties”.

The responses of the participants allow an analysis of the knowledge sharing behaviour with regard to with whom and how they share knowledge and therefore gathered data about item measures SC/OP1 (codified or personalised approach to knowledge sharing) and RC1 to RC4 (relation to various stakeholders).

Section E: Personal Information

The last section was developed in order to gain demographic information about the survey participants. Participants were asked to provide information about gender, work experience in general and how long they have been working for the organisation. Additional questions were related to the location of their office and how the office is financed.

The data for item measure HC/ESu1 (employee sustainability) was collected through questions from this section. An overview about the different sections of the online survey and the corresponding item measures can be found in Table 4.9.
Table 4.9: Overview about the different sections of the online survey and the corresponding item measures

<table>
<thead>
<tr>
<th>Section</th>
<th>Item measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section A: General Knowledge Management</td>
<td>SC/ITS1, SC/ITS2</td>
</tr>
<tr>
<td>Section B: Knowledge Needs</td>
<td>HC/EC1, HC/EC2</td>
</tr>
<tr>
<td>Section C: Knowledge Creation</td>
<td>HC/ES1, HC/ES2, HC/ES3, SC/OP2</td>
</tr>
<tr>
<td>Section D: Knowledge Sharing</td>
<td>SC/OP1, RC1, RC2, RC3, RC4</td>
</tr>
<tr>
<td>Section E: Personal Information</td>
<td>HC/ESu1</td>
</tr>
</tbody>
</table>

The procedure of the collection of the data received through the interviews, document research and online survey will be explained in the next section.

4.3 Data Collection

The KM infrastructure (organisational culture, organisational structure and IT support) of the two participating organisations were mainly investigated through semi-structured interviews (open questions) with representatives of the headquarters of the participating organisations.

In total, eight participants were interviewed (three participants of one organisation and five participants of the other organisation). All interviewees were senior management staff. The interviewees were selected by the researcher on the basis that they were in charge of the communication with the local offices and therefore able to give detailed information about the organisational culture, the organisational structure and the IT support for the local offices provided by the headquarters. Representatives from both organisations were contacted by email to describe the research project and to coordinate the date of the interview. The interviews took place in August 2007 in Hong Kong and Germany.
Based on the semi-structured interview questionnaire (discussed in section 4.3.3 chapter), the interviewees were asked to describe the organisational culture and the organisational structure. To evaluate the level of IT support, the researcher asked for a demonstration of the main databases used. In total, four people were interviewed and each interview lasted between 60 to 90 minutes. During the interview, the researcher applied the interview skills recommended by Cavana et al. (2001): active listening, reflecting responses, paraphrasing and probing to encourage an in-depth discussion, and an accurate understanding of what was disclosed. After the interview, the hand-written notes of the researcher were transcribed into a Word document to support the data analysis.

The interview data were also supplemented by in-depth-document research, including data sources like: annual reports; information leaflets’ about services and promotional material; websites; and internal documents received during the interviews. The in-depth document research was conducted in the period from June to September 2007. The information collected through the document research was analysed and combined in an excel spreadsheet to support the data analysis.

Data for the online survey was collected in two rounds. Surveys were e-mailed together with a cover letter (see Appendix B), explaining the research project, to 20 (10 per organisation) local offices in the following countries: Brazil, China, France, India, Italy, Japan, Mexico, South Africa, UK, and USA. The countries where chosen by the importance of the trade relations to the home country of the two organisations selected for the analysis. Since one of the organisations is represented through offices in 29 different countries worldwide and the other in 82 countries, the number of selected offices to participate would therefore represent 34% and 12% respectively of the total sum of offices worldwide for each organisation.

The participants were invited to fill out the online questionnaire. Only six replies were received in the first instance. As a result, the investigator contacted all of the non-responding organizations by email or phone and resent the invitation to participate in the
survey. After two weeks, two more online questionnaires had been received. In order to receive a higher response rate the investigator contacted six more local offices in the following countries: Germany (only organisation B), Hong Kong (only organisation A), as well as Malaysia and Singapore (for both organisations). As a result of this approach, four more questionnaires had been filled out. Thus in total, 12 valid out of 26 surveys (13 per organisation) were collected. Further analysis of the responses identified that for one of the organisations three responses were received from China and two from Hong Kong, resulting in six different offices of one organisation and three different offices of the other organisation participated in the survey. This represents a response rate of 35% in regards of the total number of offices invited to participate in the survey.

4.4 Data Analysis Procedures

Saunders, Lewis and Thornhill (1999) assert that during the data interpretation phase, the researcher is in the greatest danger in terms of logical leaps and false assumptions. It is therefore important to take a number of actions to ensure the quality of the information collected. In respect to the qualitative part of the research, the responses to each question were analysed after all interviews were completed and all information transcribed. Gall, Borg and Gall (1996) suggests the following approach for analysing qualitative data collected through case studies:

- Interpretational analysis: examining data for constructs, themes and patterns that explain the phenomena;
- Structural analysis: searching for patterns in the data with little or no inference as to the meaning of the pattern;
- Reflective analysis: using intuition and judgement to evaluate the phenomena.

Following this suggestion, the responses by the interviewees were analysed through a combination of interpretational and reflective analysis. The same method was used for analysing the information found during the document research. Through this, an evaluation of the organisational culture type, the organisational structure as well as the level of IT support for the two participating organisations could be made. In respect to the quantitative part of the research, all responses to the online survey were collected.
and combined in an Excel sheet. The data could then be analysed using descriptive statistics.

**Validity and reliability**

Some of the limitations of case study research relate to the requirements of research to conform to the constructs of validity and reliability. Miles and Huberman (1994) proposed a number of criteria, such as triangulation, to ensure the highest possible reliability and validity. Triangulation refers to the use of more than one approach to the investigation of a research question in order to enhance confidence in the ensuing findings. Denzin (1970) distinguished four forms of triangulation:

1. Data triangulation, which entails gathering data through several sampling strategies, so that slices of data at different times and social situations, as well as on a variety of people, are gathered.
2. Investigator triangulation, which refers to the use of more than one researcher in the field to gather and interpret data.
3. Theoretical triangulation, which refers to the use of more than one theoretical position in interpreting data.
4. Methodological triangulation, which refers to the use of more than one method for gathering data.

In order to conform to the constructs of validity and reliability this study uses the form of methodological triangulation by cross-checking the data through three different research methods: interviews, in-depth document research and an online survey. The results of the interviews, document research, observations and online survey are described in Chapter 5 – Data Results.
Chapter 5

Results

This chapter describes the results of the present research. The first part summarises the results of the interviews, document research and observations. The second part gives an overview of the results of the online survey by questionnaire section. In part three, the results for the research questions are illustrated.

Figure 5.1: Overview of Chapter 5

5.1 Results of Interviews and Document Research

The following section gives an overview about the main findings of the characteristics of the participating organisations. These findings were obtained via interviews and in-depth document research. While the findings for the evaluation of the organisational culture were only obtained through interviews, the findings for the evaluation of the organisational structure and the IT support were acquired through interviews and document research.

In total, eight participants were interviewed (five participants of Organisation A and three participants of Organisation B). One of the participants was female and seven participants were male. Only one interviewee was under 50 years of age, all other participants were 50 years of age or older. All interviewees were senior management staff. The interviewees were selected by the researcher on the basis that they were in
charge of the communication with the local offices and therefore able to give detailed information about the organisational culture, the organisational structure and the IT support for the local offices provided by the headquarters.

**Organisation A:** Organisation A is established as a network of 92 local offices in 82 countries worldwide linked to the head office as well as to 83 local offices within the home country. Most of the local offices are separate legal entities only some are direct subsidiaries of the head office. The local offices abroad are partly financed through government grants which are distributed among the local offices by the head office. The amount of the grant has to be negotiated with the head office on a yearly basis. Other sources for generating income are services offered to companies which are looking for business partners as well as fees to members of the local offices. Membership is voluntary and the members are usually German companies which have subsidiaries within the foreign countries where the local office is located. Services range from standard services such as support for setting up a business, address and partner search to specialised services such as promotion and event support, organising business delegations or training. The overall goal is to cater for the needs of the German business community (result-oriented) which often means that employees have to find solutions which go beyond the standard services (entrepreneurial behaviour). As the government grant usually covers only a small part of the whole budget for the local office, employees have to be highly flexible and innovative in order to generate income through services offered to the companies looking for support. Leadership is characterised as innovative and employees are encouraged to develop new services in order to increase revenue sources.

The head of the local office is selected by the head office in consent with the local board. The board members of the local boards are representatives of companies which are members of the local office. The heads of the local offices meet at a conference once a year in order to exchange information and new developments within the network. Other staff members of the offices are usually employed on a local contract but the head office coordinates where positions might become vacant and sends information about
these positions to employees of the local offices. Most decisions are made within the local offices without the need to consult to the head office or refer to another entity. Decisions which have an impact on the budget have to be consulted with the head office which then consults with the government in respect to the funding.

Organisation A has developed a database in 2006 which intends to link the employees of the local offices and support them in their tasks as well as informing them what services other offices are offering. The database is still in the development phase and only selected employees have access to the database. The database contains a best practice database; a search function for experts within the network of the local offices abroad and the offices located in Germany as well as for experts outside the network, a database for templates for forms, letters and presentations; and a database with contact details of all employees who have access to the database. An overview of the results relating to the KM infrastructure for Organisation A are displayed in Table 5.1.
Table 5.1: Overview of the qualitative data collected in regards to the KM infrastructure for Organisation A

<table>
<thead>
<tr>
<th>KM Infrastructure/ Variable name</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organisational Culture</strong> (Interviews)</td>
<td>OC</td>
</tr>
<tr>
<td>The overall organisational culture can be described as result-oriented supported by entrepreneurial behaviour.</td>
<td></td>
</tr>
<tr>
<td>Leadership is characterised as innovative and employees are encouraged to develop new services in order to increase revenue sources.</td>
<td></td>
</tr>
<tr>
<td>Most employees of the local offices are usually employed on a local contract. The head office supports finding a new position when the contract is due but does not guarantee a new position. Thus employment security is low and unstable.</td>
<td></td>
</tr>
<tr>
<td>Since the government grant usually covers only a small part of the whole budget for the local office, local offices have to be highly flexible and innovative in order to generate income through services.</td>
<td></td>
</tr>
</tbody>
</table>

| **Organisational Structure** (Interviews/Document research) | OS |
| Most actions can be taken without consulting the head office, only actions which would have an impact on the budget have to be consulted with the head office. |
| Decisions about strategy, human resources and IT are made within the local office, decisions regarding the budget have to be discussed with the head office. |
| There is no need to refer to someone else directly, decisions which would involve the government are usually directed via the head office. |

| **IT support** (Interviews/Document research) | IS |
| IT support for information and knowledge sharing is provided through the head offices as well as the local offices. |
| IT support for information and knowledge acquisition is provided through the head offices as well as the local offices. |
| IT support for information and knowledge finding and accessing is provided through the head offices as well as the local office. |
| Database has been developed in 2006 with the intention to link the employees of the local offices and support them in their tasks as well as informing them what services other offices are offering. The database is still in the development phase. The database contains a best practice database; a search function for experts within the network of the local offices abroad and the offices located in Germany as well as for experts outside the network, a database for templates for forms, letters and presentations; and a database with contact details of all employees who have access to the database. |
| Access to the databases is controlled by the head office and limited to selected participants. |
**Organisation B:** Organisation B has 40 local offices abroad (12 in China Mainland alone) which most of them are legal subsidiaries of the head office in Hong Kong and some (around 30%) are managed through consultants. The local offices abroad are partly financed through government grants as well as grants from the head office. Organisation B is the organiser and coordinator for the main trade fairs in Hong Kong, the head office therefore generates revenue by itself in contrast to Organisation A. Other sources for generating income within the local offices are services offered to companies which would like to establish business in the countries where the office is located and especially through services in regards to trade fairs. The overall goal is to cater for the needs of the Chinese (Hong Kong) business community (result oriented). The organisation has developed procedures for most of the services offered in order to guarantee that the services are efficient and effective. Most employees within the local offices are in general directly contracted by the head office. Employees are often send for a limited period (up to five years) from the head office to the local offices and return back to the head office after working abroad. Thus, employment security is high and stable.

Decisions which affect the daily work are made within the local offices without the need to consult to the head office or refer to another entity. Decisions which have an impact on the budget have to be consulted with the head office as well as decisions in respect to human resources or strategy.

Organisation B has a well established database which can be accessed by all employees within the head office as well as all employees within the local offices. Apart from the same functions the database of Organisation A offers (best practice database; a database for templates for forms, letters and presentations; and a database with contact details of all employees), the database contains further functions such as an online training functions; a platform where employees can publish private information and comments; information regarding office tasks and administrative support. An overview of the results relating to the KM infrastructure for Organisation B is displayed in Table 5.2.
Table 5.2: Overview of the qualitative data collected in regards to the KM infrastructure for Organisation B

<table>
<thead>
<tr>
<th>KM Infrastructure/Variable name</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational Culture</td>
<td>The overall organisational culture can be described as result oriented supported by procedures</td>
</tr>
<tr>
<td></td>
<td>Leadership is characterised as result oriented, coordinating and organising</td>
</tr>
<tr>
<td></td>
<td>Most employees within the local offices are in general directly contracted by the head office. Employees are often send for a limited period (up to five years) from the head office to the local offices and return back to the head office after working abroad. Thus, employment security is characterised as high and stable</td>
</tr>
<tr>
<td></td>
<td>Since the financial situation is relatively secure the overall strategic emphasis is focusing on efficiency and smooth operation.</td>
</tr>
<tr>
<td>Organisational Structure</td>
<td>Actions in respect to the daily work can be done without consulting the head office</td>
</tr>
<tr>
<td></td>
<td>Decisions about strategy, budget, human resources and IT have to be discussed with the head office</td>
</tr>
<tr>
<td></td>
<td>Close relationships with government, for some decisions need to refer</td>
</tr>
<tr>
<td>IT support</td>
<td>IT support for information and knowledge sharing is provided through the head offices as well as the local offices</td>
</tr>
<tr>
<td></td>
<td>IT support for information and knowledge acquisition is provided through the head offices as well as the local offices</td>
</tr>
<tr>
<td></td>
<td>IT support for information and knowledge finding and accessing is provided through the head offices as well as the local office</td>
</tr>
<tr>
<td></td>
<td>Organisation B has a well established database which can be accessed by all employees within the head office as well as all employees within the local offices. Apart from the same functions the database of Organisation A offers (best practice database; a database for templates for forms, letters and presentations; and a database with contact details of all employees), the database contains further functions like an online training function; a platform where employees can publish private information and comments; as well as information regarding office tasks and administrative support.</td>
</tr>
<tr>
<td></td>
<td>Access is controlled by the head office and all employees have access to the databases.</td>
</tr>
</tbody>
</table>
5.2 Results of the Participants of the Online Survey

5.2.1 Demographics

The traits of the sample were determined through the questions about the personal background in the last part (section E) of the questionnaire. These included the gender, age, department, current position, work experience, number of years in the organisation, location and funding source of the office.

A total of 12 people participated in the research during the data collection period. Given that 13 different offices for each organisation (26 in total) were invited to participate in the survey the response rate is 46% in total. Considering the fact that Organisation A has 82 offices worldwide, the six different offices replied to the survey represents a response rate of 7.31%. Accordingly, the three offices which replied to the survey from Organisation B would represent 10.3% of the total 29 offices worldwide. Overall, the nine offices replied to the survey from both organisations represent 8.11% of all 111 offices for both organisations worldwide. Table 5.3 provides an overview of the responses by the two organisations.

Table 5.3: Survey responses listed by organisation

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Respondents</th>
<th>Percentage in relation to offices contacted*</th>
<th>Percentage in relation to offices worldwide**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td>9 (6 offices)</td>
<td>46.15%</td>
<td>7.31%</td>
</tr>
<tr>
<td>Organisation B</td>
<td>3</td>
<td>23.07%</td>
<td>10.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12 (9 offices)</strong></td>
<td><strong>34.61%</strong></td>
<td><strong>8.11%</strong></td>
</tr>
</tbody>
</table>

**Gender and Age**

The majority of the respondents were male both in Organisation A as well as in Organisation B. Overall, 75% respondents were male and 25% were female.

Respondents were asked to identify their age by the following categories: less than 25, 26-30 years, 31-40 years, 41-50 years and above 50 years. In Organisation A, the
majority of the respondents were between 31 and 40 years old, accounting for 55% followed by respondents who were between 41 and 50 years old (33%). The respondents in Organisation B were over 50 (67%) and between 41 and 50 (33%) old. The overall age of the respondents is shown in Figure 5.2.

Figure 5.2: Age of participants in percent

<table>
<thead>
<tr>
<th>Age</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25</td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td></td>
</tr>
<tr>
<td>Above 50</td>
<td></td>
</tr>
</tbody>
</table>

**Department**

Respondents were asked to give details in which department (Trade Enquiry, Business Development, Trade Fairs, Legal or other) they worked. Most of the respondents were working in the Business Development department (33%), in the Trade Enquiry department (25%), or in other departments (33%). The high response rate to “other departments” can be explained through the fact that due to the decentralised structure of Organisation A, the departments in the various offices are not called identical (e.g. departments dealing with trade enquiries might be called Export/Import Department, Consulting, Marketing Services or other). Figure 5.3 gives an overview of the overall distribution of the departments.
All of the respondents worked in management positions. Just over half of the respondents in Organisation A were Heads of Department (55%) and two thirds of the respondents in Organisation B were Heads of Office (66%). Figure 5.4 shows the distribution of the positions held by the participants in the total sample.
**Work Experience and Number of years in the organisation**

Respondents were asked how many years of work experience they had and how many years they had worked in their current organisation. As per Figure 5.5, approximately two thirds of the respondents reported having 15 or more years of experience. A further one third reported 10 or less years of experience. The respondents in Organisation A were almost evenly distributed between less than five and over 20 years of working experience as well as an evenly distribution of numbers within the organisation (between 2 to more than 15). Respondents of Organisation B had mostly over 20 years of work experience and worked more than 15 years in the organisation. An overview about the distribution of years of work experience for both organisations in total can be found in Figure 5.5, while Figure 5.6 shows the distribution of numbers of years the participants are working in the organisation.

**Location of office**

The majority (58%) of the respondents worked in Asia (China, Hong Kong, Singapore) and the rest of the participants (42%) were worked in offices in Europe (France, Germany, Italy and the UK). Figure 5.7 illustrates the geographical distribution of the offices where the participants were located.
Funding source of office

The respondents were asked to indicate if the office was mainly funded by the government or through revenue from services. All offices of Organisation A answered that the office is partially funded by the government (between 5% and 25%) and mainly funded through services offered (between 60% and 95%). Respondents from Organisation B reported a wider distribution of the funding source (i.e. between 7% and 100% funded by government).

5.2.2 Information/Knowledge Management

In the first section of the survey, data was collected to evaluate the structural capital (IT systems: SC/ITS1 and SC/ITS2) of the organisations. Participants were asked for information about existing data bases (i.e., information or knowledge data base) provided by the organisation, if they were using these data bases and who had access to these databases (colleagues within the office, colleagues from other local offices, staff from the head office, staff from the funding organisation or staff from other related organisations).
While respondents from both organisations had a response rate of 100% for having an information database established and using it, the organisations differed in their replies regarding a knowledge data base. In total, 88.6% of the respondents of Organisation A indicated that they had a knowledge database established with a 75% usage rate. Respondents of Organisation B indicated that only 66.7% of them had a knowledge database established with a 100% usage rate. Figure 5.8 and Figure 5.9 show the usage rate of the information and knowledge databases by the participants.

Figure 5.8: Existence of Information and Knowledge Data Bases

![Figure 5.8: Existence of Information and Knowledge Data Bases](image)

Figure 5.9: Usage rate of Information and Knowledge Data Bases

![Figure 5.9: Usage rate of Information and Knowledge Data Bases](image)
Access to the databases (information and knowledge) was more limited to colleagues within Organisation A than within Organisation B. Figure 5.10 gives an overview of responses regarding access to information and knowledge database.

Figure 5.10: Access to Information and Knowledge Data Bases

![Graph showing access to databases]

The last question in this section was aimed at finding out who the participants believed was responsible for managing knowledge in the organisation, and if they believed it would be necessary to have a “Chief Information/Knowledge Manager” responsible to manage information and knowledge within their organisation.

The majority of both organisations indicated that they believed that “it is everybody’s job” to be responsible for managing knowledge (55.5% in Organisation A and 66.6% in Organisation B). However, it should be noted that the establishment of a “Chief Information/Knowledge Manager” in both organisations was recognised as very important (88.9% in Organisation A and 66.67% in Organisation B). The distribution of the rating of the responsibility for managing knowledge is shown in Figure 5.11, while Figure 5.12 demonstrates the distribution of responses relating to the importance for a Chief Information/Knowledge Manager.
Figure 5.11: Responsibility for managing knowledge

Figure 5.12: Importance of establishing a “Chief Knowledge Officer”
5.2.3 Information/Knowledge Needs

In the second section of the survey, data was collected to evaluate the human capital (employee capability: HC/EC1 and HC/EC2) of the organisations through assessment of the information and knowledge needs of the participants. Participants rated the extent that they were fully aware of the information/knowledge they needed to fulfil their job effectively; if they had this information/knowledge already available; and if they had full access to the information/knowledge need to fulfil they job effectively.

Overall, the results revealed that employees of Organisation B were slightly more confident that they were aware of the information and knowledge they need to fulfil their job (33.33% strongly agree and 66.66% agree) compared to employees of Organisation A (22.22% strongly agree and 77.77% agree). Figure 5.13 illustrates the participants perceptions of the extent that they were aware of the knowledge they needed to fulfil their job effectively.

Figure 5.13: Awareness of information/knowledge needed

With respect to availability of the information and knowledge needed to fulfil their jobs, employees of Organisation B believed they always had the information and knowledge needed (100% agree). In contrast to this, only 77.77% of the employees of Organisation
B reported that they had the information and knowledge needed always available, while 11.11% were *not sure* and 11.11% even *disagreed* with the statement. Figure 5.14 shows the assessment by the participants how well the knowledge needed was available to them.

**Figure 5.14: Availability of information/knowledge needed**

![Bar chart showing the availability of information/knowledge needed by Organisation A and Organisation B.]

Participants were asked to rate the extent that they perceived they had full access to the information and knowledge they needed to fulfil their job. Employees of Organisation B were more confident (100% *agree*) than employees of Organisation A where only 77.78% of the participants *agreed*. The remaining respondents in Organisation A were either *not sure* (11.11%) or *disagreed* (11.11%) with the statement. The assessment of the accessibility to the information and knowledge needed by the participants is reflected in Figure 5.15.
5.2.4 Knowledge Creation

In the third section of the survey data was collected to evaluate the human capital (employee satisfaction: HC/ES1, HC/ES2 and HC/ES3) as well as structural (organisational processes: SC/OP2) of the organisations through assessment of the knowledge creating sources of the organisation. More specifically, knowledge creation was assessed using questions to determine the extent that participants believed the organisation provided them with the necessary sources to create knowledge as well as opportunities for training (internal and external) in order to enhance knowledge. Additionally, one question aimed to find out which sources were used most for creating knowledge (structural capital).

In Organisation A the level of satisfaction for knowledge creating resources provided by the organisation ranged from *strongly agree* (11%) to *disagree* (22%). The level of satisfaction in Organisation B was much higher with a 100% *agreeing* that they were satisfied that the organisation provided them with sufficient knowledge resources to create knowledge needed to fulfil their job. Figure 5.16 shows the level of satisfaction with the knowledge creating resources provided by the organisation and assessed by the participants.
Employees of Organisation B reported a higher satisfaction with internal and external training provided by the organisation compared to employees of Organisation A. In total, 66.67% of the employees of Organisation B agreed that the organisation provides them with opportunities for internal and external training on a regular basis, and only 33.33% either were not sure (for internal training) or disagreed (for external training). On the other hand, only 22.22% of the employees of Organisation A strongly agreed or agreed that the organisation provided them with opportunities for internal training and 33.33% strongly agreed or agreed that the organisation provided opportunities for external training. Over 75% of the employees were not satisfied with opportunities provided for internal training and 67% of the employees were not satisfied with the opportunities provided for external training. The level of satisfaction with internal and external training opportunities provided by the organisation and rated by the participants is pictured in Figure 5.17.
The participants were asked to indicate which internal and external sources they used most for creating knowledge by choosing only the three most favoured sources.

Participants from Organisation A (over 75%) reported using mainly external sources (such as the internet, external databases, external experts or publications) to create new knowledge. In contrast, participants from Organisation B reported relying more (66.67%) on internal resources (for example internal databases, colleagues or intranet) for creating new knowledge. Figure 5.18 shows the distribution and importance of sources for knowledge creation.
5.2.5 Information/Knowledge Sharing

Data was collected to evaluate the structural capital (organisational processes: SC/OP2) and relational capital (RC1 to RC4) of the organisations. Participants were asked to rate the extent that they shared knowledge and with whom they shared their knowledge. Additionally, participants were asked to indicate the flow of knowledge sharing (codified or personalised) and the content of the information/knowledge shared (related to office tasks or related to administrative tasks).

In regards of the level of intensity with whom the employees of Organisation A and Organisation B share knowledge, the results indicated that employees in both organisations had a high level of sharing with colleagues within the office (100% either strongly agreed or agreed to this statement). Differences were evident with respect to the intensity that participants shared information or knowledge with others outside the office. Only 33.33% of the participants from Organisation A strongly agreed or agreed with respect to sharing information and knowledge with staff from the head office as well as with staff of the funding organisation, while Participants from Organisation B reported a high level of sharing (100% strongly agree or agree to these statements) with
these two groups. Table 5.4 summarises the results for the question with whom the participants share knowledge.

Table 5.4: Level of intensity of information and knowledge sharing

<table>
<thead>
<tr>
<th>Sharing with whom</th>
<th>Organisation A</th>
<th>Organisation B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Info/ Knowledge</td>
<td>Info/ Knowledge</td>
</tr>
<tr>
<td>Colleagues in office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Agree</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>Not sure</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Colleagues in other local offices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Agree</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Not sure</td>
<td>22%</td>
<td>33%</td>
</tr>
<tr>
<td>Disagree</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>Staff of HQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0%</td>
<td>67%</td>
</tr>
<tr>
<td>Agree</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Not sure</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>67%</td>
<td>0%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Staff of Funding Organisation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>11%</td>
<td>33%</td>
</tr>
<tr>
<td>Agree</td>
<td>22%</td>
<td>67%</td>
</tr>
<tr>
<td>Not sure</td>
<td>33%</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>33%</td>
<td>0%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Staff of other related organisations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Agree</td>
<td>67%</td>
<td>67%</td>
</tr>
<tr>
<td>Not sure</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>22%</td>
<td>33%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>11%</td>
<td>0%</td>
</tr>
</tbody>
</table>
In relation to knowledge sharing with others, the participants were also asked what kinds of information and knowledge (office tasks or administrative tasks related) and how (codified and/or personalised) they shared this information and/or knowledge with others (see Table 5.5).

As can be seen in Table 5.5, the highest level of information and knowledge sharing in both organisations was found amongst colleagues within the office. There was no clear structure about differences between codified or personalised approach or between office related or administrative related information or knowledge sharing in both organisations when sharing with colleagues within the office. On the other hand, the results for information and knowledge sharing with colleagues in other local offices, with staff in the head office and with staff of the funding organisation showed an evident difference. While participants from Organisation A preferred a personalised approach for sharing their knowledge with others outside the office, participants from Organisation B showed a clear preference for a codified approach to share their knowledge with these groups. Both organisations preferred a personalised approach when sharing information and knowledge with staff of other related organisations. In both organisations, information shared with others was more office task-related than administrative task-related. A different and very unstructured pattern was revealed by the results in terms of what type of knowledge was shared. Organisation A shared more knowledge regarding administrative tasks with colleagues within the office and staff from the head office. These participants also reported sharing knowledge related to organisational tasks more with colleagues from other offices. Participants from Organisation B reported that they shared more administrative knowledge than office-related task with colleagues within the office and with staff of the head office more office task related knowledge. These participants also reported that they shared both – office task and administrative task related knowledge - equally with colleagues of the other local offices and with staff of the funding organisation.
Table 5.5: Flow of information and knowledge sharing

<table>
<thead>
<tr>
<th>Sharing with whom</th>
<th>Content and flow</th>
<th>Organisation A</th>
<th>Organisation B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Info</td>
<td>Knowledge</td>
</tr>
<tr>
<td>Colleagues in office</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office tasks related</td>
<td>Codified</td>
<td>78%</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>100%</td>
<td>89%</td>
</tr>
<tr>
<td>Admin tasks related</td>
<td>Codified</td>
<td>78%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>56%</td>
<td>89%</td>
</tr>
<tr>
<td>Colleagues in other local offices</td>
<td>Codified</td>
<td>22%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Admin tasks related</td>
<td>Codified</td>
<td>22%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Staff of HQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office tasks related</td>
<td>Codified</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>Admin tasks related</td>
<td>Codified</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Staff of Funding Organisation</td>
<td>Codified</td>
<td>33%</td>
<td>22%</td>
</tr>
<tr>
<td>Office tasks related</td>
<td>Pers.</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>Admin tasks related</td>
<td>Codified</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Staff of other related organisations</td>
<td>Codified</td>
<td>11%</td>
<td>22%</td>
</tr>
<tr>
<td>Office tasks related</td>
<td>Pers.</td>
<td>56%</td>
<td>67%</td>
</tr>
<tr>
<td>Admin tasks related</td>
<td>Codified</td>
<td>22%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Pers.</td>
<td>56%</td>
<td>56%</td>
</tr>
</tbody>
</table>
5.3 Results in respect to the Research Questions

5.3.1 Results for Research Questions related to KM Infrastructure

Two research questions were raised in respect to the relation between the different elements of the KM infrastructure:

**RQ 1**
Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?

**RQ 2**
Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?

The measurements for the three elements (organisational culture, organisational structure and IT support) of the KM infrastructure were described in Chapter 4.2.1. The results of the interviews and the in-depth document research, as presented in Chapter 5.1, were analysed and the responses were sorted and evaluated based on a prepared classification table which can be found in Appendix C.

The analysis of the results of the interviews and in-depth document research shows Organisation A to be mainly described by characteristics which are typically related to an Adhocracy culture type. The overall organisational culture is described as result oriented (Market) supported by entrepreneurial behaviour (Adhocracy). Characteristics for an Adhocracy culture type can also be found in leadership which is portrayed as innovative, in management of employees which can be described as individual risk-taking, and in strategic emphasis where the creating of new challenges is important. The analysis of the results of the items in respect to organisational structure lead to the conclusion, that Organisation A was more decentralised than centralised organised, since the locus of the power to make the main decisions is mainly within the local offices. The results of the items in respect to IT support show that even support for information and knowledge sharing and acquisition is provided, the content of the database is not sufficient to handle daily tasks and the database is not accessible for all employees.
An overview of the summary of the results for the measurements of the KM infrastructure as well as the responding classification for Organisation A is presented in Table 5.6.

On the other hand, cross analysis of the results of the interviews and in-depth document research demonstrates that Organisation B is described mainly by characteristics which are typically related to a Hierarchy culture type. The overall organisational culture is described as result oriented (Market) supported by processes (Hierarchy). Characteristics for a Hierarchy culture type can also be found in leadership which is portrayed as coordinating and organising, in management of employees which can be described job safety and stability, and in strategic emphasis where an efficient and smooth operation is important. The analysis of the results of the items in respect to organisational structure lead to the conclusion, that Organisation A is more centralised than decentralised organised, since the locus of the power to make the main decisions is mainly within the head office. The results of the items in respect to IT support show that Organisation B has a stronger IT support than Organisation A, especially in richness of the content and accessibility of the databases.

An overview of the summary of the results for the measurements of the KM infrastructure as well as the responding classification for Organisation B is presented in Table 5.6.
Table 5.6: Overview about the KM infrastructure classification for Organisation A and Organisation B

<table>
<thead>
<tr>
<th>KM Infrastructure</th>
<th>Results</th>
<th>Classification</th>
<th>Results of measurements</th>
<th>Classification</th>
</tr>
</thead>
</table>
| **Organisational Culture** | result oriented/governed by formal procedures
=> Market/Hierarchy coordinating and organising
=> Hierarchy security and stability
=> Hierarchy efficiency and smooth operation
=> Hierarchy | Primarily Hierarchy culture | result oriented/entrepreneurial
=> Market/Adhocracy innovative
=> Adhocracy individual risk-taking
=> Adhocracy creating new challenges
=> Adhocracy | Primarily Adhocracy culture |
| **Organisational Structure** | the head office has to be consulted for most actions; most decisions need the approval of the head office; need to refer to someone else is likely | More Centralised | most actions can be taken without consulting the head office; most decisions can be made without the approval of the head office; need to refer to someone else is rare | More Decentralised |
| **IT support** | IT support for information and knowledge sharing is provided; IT support for information and knowledge acquisition is provided; IT support for information finding and accessing is provided; Richness and usefulness of content is seen as very good; Databases are accessible for all staff members | Stronger | IT support for information and knowledge sharing is provided; IT support for information and knowledge acquisition is provided; IT support for information finding and accessing is provided; Richness and usefulness of content is seen as not sufficient; Databases are not accessible for all staff members | Weaker |
5.3.2 Results for Research Questions related to IC

5.3.2.1 Results for Human Capital

Three research questions were raised in respect to the impact of the level of IT support on the different levels of IC (human, structural and relational capital):

**RQ 3** Do nonprofit organisations which have a stronger IT support have a higher value of Human Capital than nonprofit organisations which have a less strong IT support?

**RQ 4** Do nonprofit organisations which have a stronger IT support have a higher value of Structural Capital than nonprofit organisations which have a less strong IT support?

**RQ 5** Do nonprofit organisations which have a stronger IT support have a higher value of Relational Capital than nonprofit organisations which have a less strong IT support?

In total six items were used to assess human capital and are defined in Chapter 4, Section 4.2.2.1.: two items assessed employee capability (HC/EC1 and HC/EC2), three items assessed employee satisfaction (HC/ES1 to HC/ES3) and one item assessed employee sustainability (HC/ESu1).

The mean values for HC/EC1 of organisations with weaker (M=4.22; SD=0.44) or stronger (M=4.33; SD=0.57) IT support are demonstrated in Figure 5.19 and show that there is barely any difference in the mean values.

Figure 5.19: Mean values for HC/EC1 (employee capability, awareness)
Furthermore, the mean values for HC/EC2 of organisations with weaker (M=3.66; SD=0.7) or stronger (M=4.0; SD=0.0) IT support are demonstrated in Figure 5.20 and show that the organisation with a stronger IT support has a minimal higher mean value for HC/EC2 than the organisation which has a weaker IT support.

Figure 5.20: Mean values for HC/EC2 (employee capability, accessibility)

The means for HC/ES (employee satisfaction) for organisations with weaker and stronger IT support were through three different items (HC/ES1, HC/ES2 and HC/ES3). The difference between the organisations in respect to the mean values for employee satisfaction is more evident than the difference in respect to employee capability and shown in Figure 5.20 (HC/ES1), Figure 5.21 (HC/ES2) and Figure 5.22 (HC/ES3).

The result shows a lower mean value for HC/ES1 for the organisation with a weaker IT support (M=3.55; SD=1.01) than for the organisation with a stronger IT support (M=4.0; SD=0.0), as demonstrated in Figure 5.21.
Furthermore, the result shows a lower mean value for HC/ES2 for the organisation with a weaker IT support (M=2.66; SD=1.22) than for the organisation with a stronger IT support (M=3.66; SD=0.57), as shown in Figure 5.22.

Finally, the result shows a lower mean value for HC/ES3 for the organisation with a weaker IT support (M=2.77; SD=1.39) than for the organisation with a stronger IT support (M=3.33; SD=1.15).
The results regarding the employee sustainability show that participants in both organisations showed a high sustainability rate when comparing the number of years of work experience to the number of years in the organisation (see Table 5.7)

Table 5.7: Overview about the years of work experience and related years in the organisation listed by participants

<table>
<thead>
<tr>
<th>Participants of</th>
<th>Work experience</th>
<th>Years in the organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9 participants)</td>
<td>&lt; 5 years</td>
<td>2-5 years</td>
</tr>
<tr>
<td></td>
<td>11-15 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>16-20 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td></td>
<td>5-10 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>16-20 years</td>
<td>&gt; 15 years</td>
</tr>
<tr>
<td></td>
<td>5-10 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>11-15 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td></td>
<td>5-10 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 years</td>
<td>11-15 years</td>
</tr>
<tr>
<td>Organisation B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3 participants)</td>
<td>&gt; 20 years</td>
<td>6-10 years</td>
</tr>
<tr>
<td></td>
<td>16-20 years</td>
<td>&gt; 15 years</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 years</td>
<td>&gt; 15 years</td>
</tr>
</tbody>
</table>
The results, collected through the online survey, for measuring Human Capital through employee capability, employee satisfaction and employee sustainability are summarised in Table 5.8. Based on the results, only one of the measurement items for human capital (employee satisfaction) has a higher result for the nonprofit organisation which has a strong IT support. Two of the measurement items (employee capability and employee sustainability) don’t have a clear result.

Table 5.8: Overall results for measuring Human Capital

<table>
<thead>
<tr>
<th>Item measure</th>
<th>IT support weaker</th>
<th>Relation</th>
<th>IT support stronger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Capability (Figure 5.19; Figure 5.20)</td>
<td>almost the same</td>
<td>=</td>
<td>almost the same</td>
</tr>
<tr>
<td>Employee Satisfaction (Figure 5.21; Figure 5.22; Figure 5.23)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
<tr>
<td>Employee Sustainability (Table 5.7)</td>
<td>not clear</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.2.2 Results for Structural Capital

In total four items were used to assess structural capital (see section 4.2.2.2.) Two items assessed organisational processes (SC/OP1 and SC/OP2), and two items assessed IT systems (SC/ITS1 and SC/ITS2).

The results for SC/OP1 (codified vs. personalised approach to knowledge sharing) of organisations with weaker (Organisation A) or stronger (Organisation B) IT support are shown in Figure 5.24 as percentages. The results of the online survey demonstrated that the organisation with a stronger IT support used more a codified approach (58.3%) than a personalised approach (38%) for sharing knowledge with others. On the other hand, the organisation with a weaker IT support used less a codified approach (29.4%) than a personalised approach (43%) for sharing knowledge with others.
Figure 5.24: Results for SC/OP1 (personalised vs. codified approach to knowledge sharing) in percent.

The importance of the organisation’s own database as source for creating new knowledge (SC/OP2) is illustrated in percentage in Figure 5.25. While 55% of the participants of the organisation with a strong IT support use their own databases as a source for knowledge creation, only 8% of the participants of the organisation with a weak IT support use their own databases for this purpose.
Figure 5.25: Results for SC/OP2 (importance of own databases as sources for creating new knowledge) in percent

![Bar chart showing usage of participants own database]

Two items assessed structural capital based on the usage rate of each organisation’s own information (SC/ITS1) and knowledge (SC/ITS2) databases. The results for these measures are illustrated in Figure 5.26 and show that while both organisations have information and knowledge databases (100%), only the organisation with stronger IT support had a usage rate of 100% for both (information and knowledge) databases.
Figure 5.26: Results for SC/ITS1 and SC/ITS2 - usage rate (UR) of the information and knowledge databases provided by the organisation - in percent

![Usage Rate of databases](image)

The results for measuring structural capital through the ratio codified/personalised knowledge sharing, importance of the organisations’ own database and the usage rates of the organisations’ own databases are summarised in Table 5.9.

Table 5.9: Overall results for measuring Structural Capital

<table>
<thead>
<tr>
<th>Item measure</th>
<th>IT support weaker</th>
<th>Relation</th>
<th>IT support stronger</th>
</tr>
</thead>
<tbody>
<tr>
<td>codified vs. personalised approach (Figure 5.24)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
<tr>
<td>importance of the own databases (Figure 5.25)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
<tr>
<td>usage rate of information database (Figure 5.26)</td>
<td>same</td>
<td>=</td>
<td>same</td>
</tr>
<tr>
<td>usage rate of knowledge database (Figure 5.26)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
</tbody>
</table>
5.3.2.3 Results for Relational Capital

In total four items assessed relational capital (see section 4.2.2.3). One item assessed relations with colleagues to other local offices (RC1), one item assessed relations with staff of the head office (RC2), one item assessed relations with staff of the funding organisation (RC3) and one item assessed relations with staff of other related organisations (RC4).

The mean value for RC1 (knowledge sharing with colleagues in other local offices) can be found in Figure 5.27 and shows that participants of the organisation with a weaker IT support (M=2.78; SD=1.19) had slightly a lower level of knowledge sharing with colleagues in other local offices than participants of the organisation with a stronger IT support (M=3.0; SD=1.0).

Figure 5.27: Mean for RC1 (knowledge sharing with colleagues in other local offices)

Figure 5.28 shows the mean value for RC2 (knowledge sharing with staff of the head office). Again, participants of the organisation with a weaker IT support (M=2.67; SD=1.0) had a much lower level of knowledge sharing with staff of the head office than participants of the organisation with a stronger IT support (M=4.67; SD=0.57).
The mean value for RC3 (knowledge sharing with staff of the funding organisation) is shown in Figure 5.29 and demonstrates that participants of the organisation with a weaker IT support (M=3.11; SD=1.05) have also a much lower level of knowledge sharing with staff of the funding organisation than participants of the organisation with a stronger IT support (M=4.33; SD=0.57).

Figure 5.29: Mean for RC3 (knowledge sharing with staff in the funding organisation)
The mean value for the last item measure of relational capital, RC4 (knowledge sharing with staff of other related organisations) is demonstrated in Figure 5.30 and shows that the level of knowledge sharing was only slightly lower for participants of the organisation with a weaker IT support (M=3.22; SD=1.2) than for participants of the organisation with a stronger IT support (M=3.33; SD=1.15).

Figure 5.30: Mean for RC4 (knowledge sharing with staff of other related organisations)

Overall, the results for measuring relational capital through knowledge sharing with other stakeholders are summarised in Table 5.10. All four of the measurement items for relational capital show a higher level for the organisation which has a strong IT support.
Table 5.10: Overall results for measuring Relational Capital

<table>
<thead>
<tr>
<th>Item measure</th>
<th>IT support weaker</th>
<th>Relation</th>
<th>IT support stronger</th>
</tr>
</thead>
<tbody>
<tr>
<td>knowledge sharing relation with colleagues in other local offices (Figure 5.27)</td>
<td>same</td>
<td>=</td>
<td>same</td>
</tr>
<tr>
<td>knowledge sharing relation with staff in the head office (Figure 5.28)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
<tr>
<td>knowledge sharing relation with staff in the funding organisation (Figure 5.29)</td>
<td>lower</td>
<td>&lt;</td>
<td>higher</td>
</tr>
<tr>
<td>knowledge sharing relation with staff in other related organisations (Figure 5.30)</td>
<td>same</td>
<td>=</td>
<td>same</td>
</tr>
</tbody>
</table>

The implications from the results of the assumptions, the limitations of the research and practical implications based on the results of this study will be discussed in the Chapter 6 – Discussion, Limitations and Conclusion.
Chapter 6
Discussion, Limitations and Conclusion

The following chapter is divided into five parts, starting with the review of the purpose of this research study and the assumptions postulated in Chapter 3. Part two summarises and discusses the results of the data collection and its implications for the assumptions. Theoretical and practical implications resulting from the investigation of the assumptions will be given in part three followed by part four describing the limitations of this study and suggestions for further research. Finally, part five will close this study with some conclusions.

6.1 Review of Research Purpose and Research Questions

In recent years, practitioners and researchers, like Alavi and Leidner (2001), Drucker (1993, 1994), Kaplan and Norton (2004), Lee and Lee (2007) and many others, have turned their attention to knowledge management (KM) in order to increase organisational performance (OP). As a result, many different approaches and strategies have been investigated and suggested for how knowledge should be managed to make organisations more effective and efficient. Nevertheless, most research has been undertaken in the for-profit sector, with only a few studies focusing on the benefits nonprofit organisations might gain by managing knowledge. This study investigated the impact of knowledge management on the organisational performance of nonprofit organisations – with special focus on two nonprofit organisations involved in trade promotion.
Organisational performance can be evaluated through either financial or non-financial measurements (Kaplan and Norton, 2004). In order to evaluate the impact of knowledge management on organisational performance, non-financial measurements seem to be more suitable since knowledge is an intangible asset which often cannot be expressed through financial indicators (Kaplan and Norton, 2004; Kong, 2007). Non-financial measurement concepts of performance such as the balanced scorecard or the concept of Intellectual Capital (IC) are well accepted and used within the for-profit and nonprofit sectors to evaluate organisational performance. This study utilised the concept of IC as the method to evaluate the impact of KM on OP in the context of nonprofit organisations due to the close link between KM and IC: While KM is concerned with managing the KM processes of creation, storing, sharing and application and the organisational KM infrastructure to support these processes, IC measures the knowledge stocks in different ontological levels: at the individual level (human capital), at the group level (relational capital) and at the organisational level (structural capital).

In order to investigate the relationship between KM infrastructure, KM processes and IC a theoretical model was proposed (Figure 1.1). Based on this model, measurements for IC were developed which were linked to the main KM processes. The final KM/IC model contained four items for evaluating human capital, five items for evaluating structural capital and four items for evaluating relational capital.
In Chapter 3 the findings of the literature review were summarised and included into the proposed research model. The research model suggests that the factors of the KM infrastructure are interdependent and two research questions raised in respect to the interdependence of the factors of the KM infrastructure:

**RQ 1**

Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?

**RQ 2**

Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?

With IT support as the main instrument to perform the various KM processes, the research model suggests further that the level of IT support can support or hamper the various KM processes and with this has an impact on organisational performance demonstrated through intellectual capital. Three research questions were raised in
The research questions were investigated through empirical research following a case study approach with the focus on two nonprofit organisations, providing trade promotions services through local offices worldwide.

6.2 Discussion of the Results in respect to the Research Questions

An overview of the characteristics which result from the evaluation of the KM infrastructure (see Table 5.6) through the interviews with representatives of the two participating organisations are shown in Table 6.1.

<table>
<thead>
<tr>
<th></th>
<th>Organisation A</th>
<th>Organisation B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organisational Culture</strong></td>
<td>Adhocracy Culture</td>
<td>Hierarchy Culture</td>
</tr>
<tr>
<td><strong>Organisational Structure</strong></td>
<td>Decentralised</td>
<td>Centralised</td>
</tr>
<tr>
<td><strong>IT Support</strong></td>
<td>Weaker</td>
<td>Stronger</td>
</tr>
</tbody>
</table>

RQ 1 raised the question if a nonprofit organisation which had a Hierarchy culture would have a stronger IT support than a nonprofit organisation which had an Adhocracy culture. As can be seen in Table 6.1, the level of IT support was higher within the organisation with a Hierarchy culture type than in the organisation which was
characterised through an Adhocracy culture type. As a result, the assumption finds support through the results of the qualitative analysis.

RQ2 stated that a nonprofit organisation with a centralised organisational structure would have stronger IT support than a nonprofit organisation with a decentralised organisational structure. Table 6.1 also shows that the level of IT support is higher within the organisation with a centralised organisational structure than in the organisation with a decentralised structure. Therefore, this assumption finds support through the results of the qualitative analysis.

The results for RQ1 and RQ2 are further supported by the data gathered through the quantitative analysis (online survey). A stronger IT support in this study was characterised by databases with high accessibility, were easy to use, and with content in accordance to usefulness and relevance of the information and knowledge stored in the databases. The results of the online survey revealed (as shown in Figure 5.14 and Figure 5.15) that participants of organisation B (Hierarchy culture and centralised structure) were more confident to have the information and knowledge needed to fulfil their job always available and accessible than participants of organisation A (Adhocracy culture and decentralised structure). Furthermore, in respect to usefulness and relevance of the information and knowledge stored in the databases, the results of the online survey revealed that participants of organisation B seem to be more confident with the content of the databases and demonstrate a higher usage rate (as shown in Figure 5.9) as well as using their own databases more often for creating new knowledge (see Figure 5.18) than participants of organisation B.

RQ3 posed the question if a nonprofit organisation which characterised by stronger IT support would have a higher level of human capital than a nonprofit organisation characterised by less strong IT support. The results, collected through the online survey, for measuring Human Capital through employee capability, employee satisfaction and employee sustainability are summarised in Table 5.8. Based on the results, only one of the measurement items for human capital (employee satisfaction) had a higher result for
the nonprofit organisation with stronger IT support. Two of the measurement items (employee capability and employee sustainability) did not show a clear result. Overall, the results of the quantitative analysis did not lead to a clear result for the RQ3.

Unfortunately, the results of the qualitative analysis (interviews and in-depth document research) did not allow any conclusion in respect to employee capability or employee satisfaction. Interviews were conducted with senior management staff and therefore didn’t allow answering questions in relation to individual employees capability or satisfaction. The interviews with Organisation B revealed that the organisation had a high sustainability rate which can be explained through the high job security (employees who are sent overseas are still employed by the head office in contrast to employees of organisation A which are usually employed through a local contract). Nevertheless, the interviews or the in-depth document research did not suggest any relation between stronger IT support and the level of human capital. Therefore, the research question can not be investigated through triangulation.

RQ4 asked the question if a nonprofit organisation which had a stronger IT support would have a higher level of structural capital than a nonprofit organisation which had a less strong IT support. The results for measuring structural capital through the ratio codified/personalised knowledge sharing, importance of the organisations’ own database and the usage rates of the organisations’ own databases are summarised in Table 5.9. The results revealed that organisations with a strong IT support use more a codified approach of sharing knowledge than organisations which had a less strong IT support. Also, these organisations used their own databases as an instrument for knowledge acquisition and creation of knowledge more often than organisations which have a less strong IT support. While the usage rate for the information databases are similar in both organisations, the organisation with the stronger IT support uses the knowledge database more often than the organisation with less strong IT support. In total, three out of the four measurement items (codified approach, importance of the own database, usage rate of information and knowledge database) showed a higher level for the organisation which has a stronger IT support and only one measurement item shows an equal level.
Therefore, the RQ4 can be partially answered positively based on the results of the quantitative research.

The result for RQ4 is further supported by the data gathered through the qualitative analysis (interviews and in-depth document research). Structural capital is described as the pool of knowledge that remains in an organisation at the end of the day after individuals within the organisation have left – such as databases, process manuals, strategies, routines, publications and copyrights. The interviews as well as the review of the data bases and disclosed that organisation B provides a data base with more content (see Table 5.1 and Table 5.2 – IS4) than the data base of organisation A. Furthermore, the review of other information material (such as manuals and publication list) showed that even both organisation provide a centralised library, organisation B offers more publications than organisation A to support employees and customers.

RQ5 raised the question if nonprofit organisations which have a stronger IT support have a higher level of relational capital than nonprofit organisations which have a less strong IT support. The results for measuring relational capital through knowledge sharing with other stakeholders are summarised in Table 5.10. Two of the four measurement items for relational capital show a higher level for the organisation which has a stronger IT support and two measurement items show almost the same result. Therefore, the can be partially answered positively based on the results of the quantitative research.

The result for RQ5 is further supported by the data gathered through the qualitative analysis (interviews and in-depth document research). The interviews exposed that the access to the data base of organisation A is limited while the data base of organisation B is accessible to all employees worldwide (see Table 5.1 and Table 5.2 - IS). Furthermore, organisation B also provides access to the data base for staff of the funding organisation which makes it easier to share information and knowledge.
Overall, four of the research questions raised on basis of the proposed research model in Chapter 3, can be partially answered positively through the qualitative and/or quantitative analysis of this study.

6.3 Theoretical and Practical Implications

6.3.1 Theoretical Implications

Although the literature has documented positive relationships between knowledge management and organisational performance, no empirical research exists with regard to the nonprofit sector. Hence, this study aimed to broaden the existing understanding of knowledge management and its relevance for organisational performance of nonprofit organisations.

Furthermore, the research developed a model for measuring organisational performance in form of intellectual capital, which aimed to make theoretical contributions in special regards to the nonprofit sector. The developed measurements are based on the integration of the two constructs KM processes and IC and therefore follow the call of Liebowitz and Suen (2000) to find new measurements for IC in relation to knowledge management.

Additionally, a theoretical model in respect to the relation between KM infrastructure, KM processes and IC was introduced and five research questions were posed and investigated. The model stresses the importance of IT support as the main instrument to carry out the KM processes (creating, storing, sharing and applying knowledge). The results of the investigation of the research questions partially support previous research.

RQ 1 raised the question if nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture. The research question finds support through the results of the qualitative analysis. This result also supports the research of Cooper and Quinn (1993) that IT systems are used for different purposes and with a different focus by different organisational cultures.
RQ 2 asked the question if nonprofit organisations with a centralised organisational structure will have a stronger IT support than nonprofit organisations which have a decentralised organisational structure. This assumption finds also support through the results of the qualitative analysis. Furthermore, the results supports the research of Schroeder and Pauleen (2007) who argue that IT governance is easier in centralised organisations where organisational activities are organised by top management.

RQ 3 posed the question if nonprofit organisations which have a stronger IT support have a higher level of human capital than nonprofit organisations which have a less strong IT support. Overall, the results of the quantitative research did not show any clear results.

RQ 4 asked the question if nonprofit organisations with stronger IT support have a higher level of structural capital than nonprofit organisations with less strong IT support. The assumption can be seen as supported through the results of the quantitative research. The result that organisations with a strong level of IT support prefer a codified approach for knowledge sharing together with the result that organisations with a Hierarchy culture type have a stronger IT support, supports the results of Roman-Velasquez (2004) who found through his research that organisations with a Hierarchy culture type prefer the codification approach for knowledge sharing, while organisations with an Adhocracy culture type prefer a personalisation approach.

RQ 5 raised the question if nonprofit organisations which have a stronger IT support have a higher level of relational capital than nonprofit organisations which have a less strong IT support. The assumption also finds support through the results of the quantitative research. This supports the statement of Alavi and Leidner (2001) that IT can further support knowledge sharing by extending the individual’s reach beyond the formal communication lines. Shared databases or computer networks can facilitate the communication between different groups.
Overall, all five assumptions made on basis of the proposed research model in Chapter 3, and which find support through the empirical part of this study, are supporting similar theories already proposed by other researchers. An overview of the research questions and the related studies of other researchers is shown in Table 6.2.

Table 6.2: Overview about results for research questions and other related research studies

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Status</th>
<th>Related research studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ 1  Do nonprofit organisations which have a Hierarchy culture have a stronger IT support than nonprofit organisations which have an Adhocracy culture?</td>
<td>Yes</td>
<td>Cooper and Quinn (1993)</td>
</tr>
<tr>
<td>RQ 2  Do nonprofit organisations which have a centralised organisational structure have a stronger IT support than nonprofit organisations which have decentralised organisational structure?</td>
<td>Yes</td>
<td>Schroeder and Pauleen (2007)</td>
</tr>
<tr>
<td>RQ 3  Do nonprofit organisations which have a strong IT support have a higher value of Human Capital than nonprofit organisations which have a less strong IT support?</td>
<td>Not clear</td>
<td>Huang (1999)</td>
</tr>
<tr>
<td>RQ 4  Do nonprofit organisations which have a strong IT support have a higher value of Structural Capital than nonprofit organisations which have a less strong IT support?</td>
<td>Partially Yes</td>
<td>Roman-Velasquez (2004)</td>
</tr>
<tr>
<td>RQ 5  Do nonprofit organisations which have a strong IT support have a higher value of Relational Capital than nonprofit organisations which have a less strong IT support?</td>
<td>Partially Yes</td>
<td>Alavi and Leidner (2001)</td>
</tr>
</tbody>
</table>
6.3.2 Practical Implications

The results of this study stress the importance of IT support in order to manage knowledge and with this to increase IC (human capital, structural capital and relational capital). A study of Hackler and Saxton (2007) shows that due to financial constraints IT priorities amongst nonprofit organisation are often dwarfed by other concerns. Financial capacity often represents a barrier to the implementation of technology solution. Based on the theoretical model provided and the measurements developed, managers of nonprofit organisations could use this study to analyse strengths and weaknesses with respect to IT support for managing knowledge within their own organisation.

The following suggestions can be drawn from the results of this study: For organisations which have offices in various locations, IT seems to be an important instrument to create, store, share and apply knowledge. Furthermore, creating, sharing, storing and applying knowledge is managed more efficiently when data bases are centralised. Data bases providing useful and relevant information and knowledge can increase employee capability and employee satisfaction and therefore the human capital of the organisation. Moreover, data bases storing useful and relevant information and knowledge can increase the structural capital of the organisation. High accessibility to the data bases can increase knowledge sharing and therefore the relational capital of the organisation.

6.4 Limitations and Suggestions for further Research

This study has several limitations, which should be considered in order to better understand the implications of this research.

First, this study used a case study approach and therefore faces the criticism and limitations which are associated with this type of research. Common criticism of the case study approach is that it is subjective, lacks statistical validity and has potential for bias (Cavana et al., 2001).

Second, the study is further limited through the small size of the sample for the qualitative as well as the quantitative research approach. The objective of the interviews
and document research was to identify the characteristics of the KM infrastructure for the organisations which have been used in the case study. But since only two organisations had to be analysed, the researcher believed that interviews with three (and five respectively) representatives for each organisation were sufficient to collect the data needed to evaluate the organisational culture type, the organisational structure as well as the IT support for both organisations. The objective of the online survey was to collect data for measuring and evaluating the intellectual capital within the two organisations. An online survey was used as the method to collect the relevant data and a much higher response rate was anticipated at the beginning of the research study. The low response rate (12 responses) could be explained through a) that the type of organisations which were analysed in this study usually receive a high amount of surveys and questionnaires from students as well as consultants and therefore responding to surveys might not be of high priority for them and b) that the online survey was distributed through email which could not always be personalised, and therefore might have seen as spam email by some of the participants invited.

Due to the use of the case study approach and the small sample size, the results of the research cannot be generalised but should be seen as a pilot test for testing the proposed research model as well as the research questions raised in relation to the research model. In order to test the validity and the reliability of the proposed research model further research with a much larger sample including several types of organisations are suggested.

Furthermore, since this research is based on a case study with only two participating organisations, the results for RQ 1 and RQ 2 are not fully conclusive since it is impossible to say which of the factor of the KM infrastructure (organisational culture or organisational structure) has the stronger influence on the level of IT support. For this, it would be necessary to enlarge the sample and analyse a bigger number of organisations which might show other combinations of organisational culture/organisational structure/IT support, than the organisations which have been in focus of this study.
Third, the proposed KM/IC Measurement model did not take into account possible direct impact of organisational culture and/or organisational structure on the various KM processes. IT systems were seen as the main instrument used by organisations to create, store, share or apply knowledge. Further research is necessary to investigate the direct impact of organisational culture and/or organisational structure on the various KM processes.

It can also be noted that, in the present study, the participants originated from different national cultures (i.e., Germany and Hong Kong). Future research should endeavour to establish if the potential relationships identified in the model used for this thesis differ as a function of national cultures in which organisations are located.

6.5 Conclusion

The topic of knowledge management is still relatively new and relationships between the KM infrastructure and the KM processes as well as the impact of KM on IC have still to be investigated further. The existing literature on KM is often confusing in some cases even contradictory. This study made the attempt to clarify the role of the KM infrastructure and its impact on KM processes and IC and developed a theoretical model to explain these relations. As a result, it supports some of the existing findings within the knowledge management literature with regards to the relationship between KM infrastructure, KM processes and IC. In addition, the study extends the existing literature in suggesting interdependence between the main factors of the KM infrastructure (organisational culture, organisational structure and IT support) and stresses the importance of IT support as the main instrument for managing KM processes (creating, storing, sharing and applying knowledge). Furthermore, the study investigated the topic in the context of nonprofit organisations and therefore shows the relevance of knowledge management for this sector. Finally, by proposing a theoretical model explaining the relation between KM and IC, the study laid the foundation for future research which can only assist in building our understanding about the impact of KM on IC.
Appendices

Appendix A: Online Survey

Appendix B: Invitation to Participate in Survey sent by Email

Appendix C: Table for Evaluation of KM Infrastructure Items
Appendix A: Online Survey

Knowledge Management in international networks:  
a comparison between public and private trade promotion organisations

Description
The purpose of this project is to analyse and compare knowledge creation, knowledge sharing and knowledge management in approximately 30 international offices of 3 different trade promotion organizations with headquarters based in Australia, Germany and Hong Kong.

Participation
Your participation in this project is voluntary.

Research Team Contacts

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Project Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ute Quink</td>
<td>Dr Cameron Newton</td>
</tr>
<tr>
<td>+ 61 7 3863 4795</td>
<td>+ 61 7 3138 4043</td>
</tr>
<tr>
<td><a href="mailto:ute.quink@qut.edu.au">ute.quink@qut.edu.au</a></td>
<td><a href="mailto:cj.newton@qut.edu.au">cj.newton@qut.edu.au</a></td>
</tr>
</tbody>
</table>

Please refer to your invitation letter regarding time zone differences between countries

QUT Website: www.qut.edu.au
QUT’s Centre of Philanthropy and Nonprofit Studies Website: www.bus.qut.edu.au/research/cpns/

Terms and Conditions

Expected benefits
After the conclusion of the research project, you will receive the results of the research and you might use them to compare the knowledge management in your office with the knowledge management in other offices of your organisation as well as with other organisations.

Risks
There are no risks beyond normal day-to-day living associated with your participation in this project.

Confidentiality
All comments and responses are anonymous and will be treated confidentially. The names of individual persons are not required in any of the responses. Nor will any individual office be identified. All data contained in the final report will be aggregated data (combined) from an organisational level only.

Questions / further information about the project
This project is being undertaken as part of a Master in Business (Research) at Queensland University of Technology (QUT), Centre of Philanthropy and Nonprofit Studies (CPNS) Brisbane, Queensland, Australia. Please contact the researcher team members named above to have any questions answered or if you require further information about the project.

Concerns / complaints regarding the conduct of the project
QUT is committed to researcher integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Officer on + 61 7 3138 2340 or ethicscontact@qut.edu.au. The Research Ethics Officer is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Consent to Participate
By proceeding to the questionnaire, you will indicate to the research team that you:
- Agree to participate in the project
- Have read and understand the information presented here
- Understand that results made public will be aggregated data only
- Understand that you may decline to answer questions

By sending back the questionnaire, you will indicate to the research team that you agree to the above Terms and Conditions.
Part A: Information/Knowledge Management

A1 Does your organisation have an "information data base" (or something similar) which you can use to answer enquiries? (information is facts, documents, etc.)
☐ Yes ☐ No ☐ Not sure

A1.1 Do you regularly use this "information data base" (or something similar)?
☐ Yes ☐ No

A1.2 Who else has access to this data base?
☐ Only the colleagues from my office
☐ Colleagues from other overseas offices
☐ Staff from our headquarter
☐ Staff from the institution which is (partly) funding our organisation
☐ Staff from other related organisations

A2 Does your organisation have a "knowledge data base" (or something similar) which you can use to answer enquiries? (knowledge is experienced information)
☐ Yes ☐ No ☐ Not sure

A2.1 Do you regularly use this "knowledge data base" (or something similar)?
☐ Yes ☐ No

A2.2 Who else has access to this data base?
☐ Only the colleagues from my office
☐ Colleagues from other overseas offices
☐ Staff from our headquarter
☐ Staff from the institution which is (partly) funding our organisation
☐ Staff from other related organisations

A3 Who do you think is most responsible for managing knowledge in your organisation?
☐ Head of the organisation ☐ Head of Department
☐ My direct supervisor ☐ It is everybody’s job

A4 Do you think it is necessary to have a "Chief Information/Knowledge Officer" to be responsible to manage information/knowledge in your organisation?
☐ Yes ☐ No ☐ Does not matter
Part B: Information/Knowledge Needs

B1 I am fully aware of the information/knowledge I need to fulfil my job effectively

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree

B2 I always have the information/knowledge I need to fulfil my job effectively myself or I know how and where I can get it

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree

B3 I always have full access to the information/knowledge I need to fulfil my job effectively

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree
Part C: Knowledge Creation

C1 My organisation always provides the necessary sources (internet, publications, colleagues, etc.) for me to create the knowledge I need to fulfil my job effectively

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree

C2 My organisation provides opportunities on a regular basis to attend training *internally* to enhance knowledge creation

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree

C3 My organisation provides opportunities on a regular basis to attend training *externally* to enhance knowledge creation

☐ Strongly agree
☐ Agree
☐ Not sure
☐ Disagree
☐ Strongly disagree

C4 Which three sources are you using *most* for creating knowledge? (Please select only three)

☐ Internet
☐ Internal database
☐ Colleagues
☐ Intranet
☐ External database
☐ External experts
☐ Magazines, Newsletters or other publications
☐ Training/Workshops/Seminars

Other: 

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Part D: Information/Knowledge Sharing

D1.1 I share information/knowledge on a regular basis with my colleagues in our office

- Strongly agree
- Agree
- Not sure
- Disagree
- Strongly disagree

If you agree or strongly agree, please indicate what and how you are sharing it, otherwise go directly to D2.1

Information (facts, documents) related to my office tasks through:

- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to my office tasks through:

- automated processes/data bases and/or personal ties

Information (facts, documents) related to administrational tasks through:

- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to administrational tasks through:

- automated processes/data bases and/or personal ties

D2.1 I share information/knowledge on a regular basis with other overseas offices

- Strongly agree
- Agree
- Not sure
- Disagree
- Strongly disagree

If you agree or strongly agree, please indicate what and how you are sharing it, otherwise go directly to D3.1

Information (facts, documents) related to my office tasks through:

- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to my office tasks through:

- automated processes/data bases and/or personal ties

Information (facts, documents) related to administrational tasks through:

- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to administrational tasks through:

- automated processes/data bases and/or personal ties

D2.2 Please indicate with how many people from other overseas offices you have been in direct contact (through email, phone or other) over the last 6 months:

- none
- 1 or 2
- 3 to 5
- more than 5
D3.1 I share information/knowledge on a regular basis with the headquarter of our organisation
[ ] Strongly agree  [ ] Agree  [ ] Not sure  [ ] Disagree  [ ] Strongly disagree

If you agree or strongly agree, please indicate what and how you are sharing it, otherwise go directly to D4.1

Information (facts, documents) related to my office tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Knowledge (experienced information) related to my office tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Information (facts, documents) related to administrative tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Knowledge (experienced information) related to administrative tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

D3.2 Please indicate with how many people from the headquarter of your organisation you have been in direct contact (through email, phone or other) over the last 6 months.
[ ] none  [ ] 1 or 2  [ ] 3 to 5  [ ] more than 5

D4.1 I share information/knowledge on a regular basis with the organisation which is (partly) funding our office
[ ] Strongly agree  [ ] Agree  [ ] Not sure  [ ] Disagree  [ ] Strongly disagree

If you agree or strongly agree, please indicate what and how you are sharing it, otherwise go directly to D5.1

Information (facts, documents) related to my office tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Knowledge (experienced information) related to my office tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Information (facts, documents) related to administrative tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

Knowledge (experienced information) related to administrative tasks through:
[ ] automated processes/data bases and/or [ ] personal ties

D4.2 Please indicate with how many people from the organisation which is (partly) funding your office you have been in direct contact (through email, phone or other) over the last 6 months.
[ ] none  [ ] 1 or 2  [ ] 3 to 5  [ ] more than 5
D5.1 I share information/knowledge on a regular basis with other organisations related to our business

- Strongly agree
- Agree
- Not sure
- Disagree
- Strongly disagree

If you agree or strongly agree, please indicate what and how you are sharing it, otherwise go directly to E1

Information (facts, documents) related to my office tasks through:
- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to my office tasks through:
- automated processes/data bases and/or personal ties

Information (facts, documents) related to administrational tasks through:
- automated processes/data bases and/or personal ties

Knowledge (experienced information) related to administrational tasks through:
- automated processes/data bases and/or personal ties

D5.2 Please indicate with how many people from other organisations related to your business you have been in direct contact (through email, phone or other) over the last 6 months.

- none
- 1 or 2
- 3 to 5
- more than 5
### Part E: Personal Background

**E1 Gender**
- [ ] Female
- [ ] Male

**E2 Age**
- [ ] less than 25 years
- [ ] 26-30 years
- [ ] 31-40 years
- [ ] 41-50 years
- [ ] above 50 years

**E3 Department**
- [ ] Information/Trade Enquiry
- [ ] Business Development
- [ ] Trade Fairs
- [ ] Legal
- [ ] Other

**E4 Current position**
- [ ] Head of Office
- [ ] Head of Department
- [ ] Manager
- [ ] Assistant Manager
- [ ] Other

**E5 Work Experience**
- [ ] Less than 5 years
- [ ] 5-10 years
- [ ] 11-15 years
- [ ] 16-20 years
- [ ] More than 20 years

**E6 Number of years in the organisation**
- [ ] Less than 1 year
- [ ] 2-5 years
- [ ] 6-10 years
- [ ] 11-15 years
- [ ] More than 15 years

**E7 My office is located in**
- [ ] Brazil
- [ ] China
- [ ] France
- [ ] India
- [ ] Italy
- [ ] Japan
- [ ] Mexico
- [ ] South Africa
- [ ] UK
- [ ] USA

**E8 Our office is**
- [ ] 100% funded by Government
- [ ] Partly funded by Government by _____%
- [ ] Partly financed through services provided through _____%
- [ ] Don't know
Appendix B: Invitation to Participate sent by Email

Invitation to Participate in Research Study - Knowledge Management in International Networks

Dear ,

Information and knowledge are the most important assets in any company. This is especially true for trade promotion organisations like yours, where providing valid information and knowledge to exporters and importers is your most important service in order to support them to become successful in the global markets.

But how is knowledge created and shared in international networks? That’s what we want to find out with our online survey.

This project is undertaken as part of the Master in Business (Research) program at Queensland University of Technology (QUT), Brisbane/Australia. The purpose of this project is to gain information about knowledge creation, knowledge sharing and knowledge management in international networks through an online survey. For further details please follow the link to the survey below.

What action is required?

Please forward this email to staff members in your office (as many as possible) who have direct contact with customers/clients (e.g. Enquiry Department, Trade Fair Department, Business Consulting Department, etc.) and you think who would be willing to participate in the study by filling out the online questionnaire (approximately 10-15 minutes).

Please open the online survey by clicking the following link: (LINK provided)

Your benefits

Every participating office will receive a copy of the research results and with it you will be able to compare the knowledge management within your office to other offices worldwide.

If you have any queries about this project, please do not hesitate to contact me or my supervisor, Dr Cameron Newton. We would be delighted to hear from you.

Thank you for your valuable time.

Yours sincerely,

Ute Quink
Principal Investigator
Email: ute.quink@qut.edu.au
Phone: +61 7 3863 4795

Dr Cameron Newton
Project Supervisor
Email: cj.newton@qut.edu.au
Phone: +61 7 3138 4043

Please note that Brisbane is 10 hours ahead of Greenwich Time
### Appendix C: Table for Evaluation of KM Infrastructure

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Questions</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational Culture</td>
<td>Participants were asked … Responses</td>
<td>Culture Type</td>
</tr>
<tr>
<td>How could the overall organisational culture be described?</td>
<td>The organisation is a very personal place. It is like an extended family. People seem to share a lot of themselves.</td>
<td>Clan</td>
</tr>
<tr>
<td></td>
<td>Organisation is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.</td>
<td>Adhocracy</td>
</tr>
<tr>
<td></td>
<td>The organisation is very results-oriented. A major concern is getting the job done. People are very competitive and achievement-oriented.</td>
<td>Market</td>
</tr>
<tr>
<td></td>
<td>The organisation is a very controlled and structured place. Formal procedures generally govern what people do.</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>How could leadership in the organisation be described?</td>
<td>The leadership in the organisation is generally considered to exemplify mentoring, facilitating, or nurturing.</td>
<td>Clan</td>
</tr>
<tr>
<td></td>
<td>The leadership in the organisation is generally considered to exemplify entrepreneurship, innovation, or risk taking.</td>
<td>Adhocracy</td>
</tr>
<tr>
<td></td>
<td>The leadership in the organisation is generally considered to exemplify a no-nonsense, aggressive results-oriented focus.</td>
<td>Market</td>
</tr>
<tr>
<td></td>
<td>The leadership in the organisation is generally considered to exemplify coordinating, organising, or smooth-running efficiency.</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>How could the management style in the organisation be described?</td>
<td>The management style in the organisation is characterised by teamwork, consensus, and participation.</td>
<td>Clan</td>
</tr>
<tr>
<td></td>
<td>The management style in the organisation is characterised by individual risk-taking, innovation, freedom and uniqueness.</td>
<td>Adhocracy</td>
</tr>
<tr>
<td></td>
<td>The management style in the organisation is characterised by hard-driving competitiveness, high demands, and achievement.</td>
<td>Market</td>
</tr>
<tr>
<td></td>
<td>The management style is characterised by security of employment, conformity, predictability, and stability in relations.</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>What is the glue that holds the organisation together?</td>
<td>The glue that holds the organisation together is loyalty, and mutual trust. Commitment to this organisation runs high.</td>
<td>Clan</td>
</tr>
<tr>
<td></td>
<td>The glue that holds the organisation together is commitment to innovation and development. There is an emphasis on being on the cutting edge.</td>
<td>Adhocracy</td>
</tr>
<tr>
<td></td>
<td>The glue that holds the organisation together is the emphasis on achievement and goal accomplishment.</td>
<td>Market</td>
</tr>
<tr>
<td></td>
<td>The glue that holds the organisation together is formal rules and policies. Maintaining a smooth-running organisation is important.</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>Constructs</td>
<td>Questions</td>
<td>Evaluation Criteria</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Organisational Structure</td>
<td>What is the strategic emphasis of the organisation?</td>
<td>Clan</td>
</tr>
<tr>
<td></td>
<td>The organisation emphasises human development. High trust, openness, and participation persist.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The organisation emphasises acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.</td>
<td>Adhocracy</td>
</tr>
<tr>
<td></td>
<td>The organisation emphasises competitive actions and achievement. Hitting stretch targets and winning in the marketplace.</td>
<td>Market</td>
</tr>
<tr>
<td></td>
<td>The organisation emphasises permanence and stability. Efficiency, control, and smooth operations are important.</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>Organisational Structure</td>
<td>How are decisions made in the local offices? Which decisions are made by the local offices, which have to be consulted with the head office? Does the local office need to refer to another party when making decisions?</td>
<td>Structure</td>
</tr>
<tr>
<td></td>
<td>Sample responses: The local office … can take action without consulting the head office</td>
<td>Decentralised</td>
</tr>
<tr>
<td></td>
<td>cannot take action without consulting the head office</td>
<td>Centralised</td>
</tr>
<tr>
<td></td>
<td>can make decisions without approval from the head office</td>
<td>Decentralised</td>
</tr>
<tr>
<td></td>
<td>cannot make decisions without approval from the head office</td>
<td>Centralised</td>
</tr>
<tr>
<td></td>
<td>do not need to refer to someone else</td>
<td>Decentralised</td>
</tr>
<tr>
<td>Organisational Structure</td>
<td>Does the organisation provide IT support for information and knowledge creating, storing, sharing and acquisition? In addition: the existing databases were evaluated based on richness and usefulness of the content and accessibility</td>
<td>IT Support</td>
</tr>
<tr>
<td></td>
<td>Sample responses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Organisation provides IT support for information and knowledge sharing</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Organisation does not provide or only minimal IT support for information and knowledge sharing</td>
<td>Weak</td>
</tr>
<tr>
<td></td>
<td>Organisation provides IT support for information and knowledge acquisition</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Organisation does not provide or only minimal IT support for information and knowledge acquisition</td>
<td>Weak</td>
</tr>
<tr>
<td></td>
<td>Organisation provides IT support for information and knowledge finding and accessing</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Organisation does not provide or only minimal IT support for information and knowledge finding and accessing</td>
<td>Weak</td>
</tr>
<tr>
<td></td>
<td>Content of databases useful to handle daily office tasks</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Content of databases not useful to handle daily office tasks</td>
<td>weak</td>
</tr>
<tr>
<td></td>
<td>Accessibility high (all employees)</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Accessibility low (selected participants)</td>
<td>Weak</td>
</tr>
</tbody>
</table>


Huang, C.D. (1999). *The Impacts of Information Technology on Organizational Effectiveness in Human Service Organizations*. The University of Texas in Austin.


Raven, and Prasser


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