

Integrating knowledge seeking into knowledge management models, frameworks, and strategies

Masters in Information Science (MIS) Dissertation

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Abstract

Knowledge management (KM) is something that we as humans have practiced for generations by means of sharing stories around the fireplace, passing down recipe books, teaching trade crafts to children and showing young adults how to hunt. This primitive version of KM was not described as an area of development or expertise within organisations until 1995 when Nonaka and Takeuchi's SECI model revolutionised the world of KM. Since then, many KM researchers have contributed to the field and tried to establish its true foundations. As a result, many KM models and frameworks have emerged leading to a call for the standardisation of KM terminology, and the harmonisation of about 160 existing KM models and frameworks.

What has been strikingly overlooked in all these KM models and frameworks is the idea of knowledge seeking as a necessary theoretical component and as a key KM process. Only recently there have been a few attempts to integrate knowledge seeking into KM models and frameworks. With a view to taking this development further, this study achieves two things. First, the study assesses the theoretical status of knowledge seeking in some of the established KM models, frameworks and strategies, and reviews the work of KM researchers who have grappled with the idea of knowledge seeking. Second, the study describes some of the key features of knowledge seeking in a sample of companies.

Four companies were selected according to their type and size. They included a small business intelligence consulting company, a branch office of a country-wide IT company, a department within a larger insurance company, and a company that deals with financial software. Using questionnaires and descriptive statistical methods to generate, analyse and interpret the data, the study delineates some of the key features of knowledge seeking in the workplace by asking where people seek knowledge to solve problems, where they seek knowledge under the pressure of time, and where they would prefer to seek knowledge in ideal circumstances.

On the basis of the data, the study revises Han Lai and Margaret Graham's KM life cycle model, which is the latest version of a KM model that integrates knowledge seeking. Additionally, the

study adapts Hansen *et al*'s codification versus personalisation KM strategy. The study therefore contributes to the theoretical aspects of KM by showing that knowledge seeking deserves sustained analysis in KM models and frameworks as a KM process, and it contributes to KM practice by showing the implications of knowledge seeking for KM strategies.

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Abbreviations

KM	–	Knowledge Management
KMS	–	Knowledge Management Strategy
IT	–	Information Technology
KMF	–	Knowledge Management Framework
OBIEE	–	Oracle Business Intelligence Enterprise Edition
CIO	–	Chief Information Officer
CKO	–	Chief Knowledge Officer

Chapter 1 Introduction

1.1 Background of the study

For some business companies, knowledge management (KM) starts with specific Information Technology (IT) applications. For other companies, KM is left to their human resources or marketing departments. ‘Intelligent’ companies, however, craft a knowledge management strategy (KMS) to guide the development of their knowledge management capabilities (Seeley, 1999). Being the best in a highly competitive business world is no longer good enough. It is necessary to be better than the best. What this means is that companies can never stop improving. There are many tools and techniques used in the business world to gain a competitive edge. Many of these are fads that come and go or that quickly fall away to be replaced with the next big promise to give a company the edge over its competitors. There is consensus, however, that a more enduring and reliable success factor is knowledge, or as Prusak (2001: 11) puts it: "In the emerging economy, a firm's only advantage is its ability to leverage and utilise its knowledge."

KM is not entirely new because for hundreds of years as ‘knowledgeable’ human beings we have been doing KM, although not in the strict theoretical sense of the term. As humans, we have been telling stories around campfires and in other locales for centuries. In this sense there has always been knowledge sharing. In the agricultural and industrial ages, fathers and mothers handed down the secrets and knowledge of their trades to their sons and daughters. This is much the same in today’s information or post-industrial age. In companies and organisations, team leaders or mentors explain to new employees the ‘ins and outs’ of their jobs. Cruywagen *et al* (2008) explain that knowledge about discoveries made thousands of years ago and passed on to succeeding generations through storytelling, apprenticeships, and in written form, has helped to promote the rise of modern industries. Sharing know-how and exchanging ideas has led to the creation of new knowledge, and the application of this new knowledge to common problems has resulted in countless innovations (Cruywagen *et al.*, 2008: 101).

We have in fact been practicing KM for a long time, but have never consciously named it as such or allocated resources to this invaluable process. What has been realised more recently is that KM requires purpose and direction that is based on a solid strategy and the use of the appropriate methods and tools to leverage already-existing knowledge. Many practitioners of KM increasingly view ‘knowledge sharing’ as a better description of what they actually do than ‘knowledge management’. The advantages of ‘knowledge sharing’ as a term include its commonsense comprehensibility, along with a certain degree of inter-activity implicit in any kind of sharing (Denning, 2000).

In the late 1960s, KM was a revolutionary new business tool although it was initially applied to military purposes. It was however quickly adopted in the business world when it proved useful. KM achieved wider acceptance in business and academic circles in the early 1990s with the introduction of the SECI (Socialisation, Externalisation, Combination, and Internalisation) model of Nonaka (1991). Nonaka and Takeuchi (1995) later revolutionised the KM field when they published an article entitled ‘The Knowledge Creating Company’. This article advanced KM thinking, and produced one of the most well-established KM models.

Although it will be discussed more fully in Chapter two, this model is worth outlining here briefly. The SECI model depicts the ways in which humans and organisations create, use, and disseminate knowledge. Nonaka and Takeuchi (1995) base their views on tacit and explicit knowledge. Tacit knowledge is knowledge that resides in one’s mind and is intangible. Explicit knowledge is knowledge that has been transferred to something ‘concrete’ and that can be seen and touched. The SECI model is divided into four quadrants (See Figure 1). Each quadrant represents one of four methods of knowledge transfer. The Socialisation quadrant focuses on linking tacit with tacit knowledge. New knowledge is created through the processes of observing, discussing, analysing, and spending time together or living in the same environment. Socialisation is also known as creating new knowledge through shared experiences. This occurs in traditional environments where, for example, a son learns the technique of wood craft from his father by working with him.

Externalisation is the process that focuses on linking tacit with explicit knowledge. This helps in the creation of new knowledge as tacit knowledge moves beyond its boundaries and becomes collective group knowledge. The Combination quadrant explains how knowledge transforms from explicit knowledge to explicit knowledge. The finance department of a company, for example, collects all financial reports from other departments and publishes a consolidated annual financial performance report. The creative use of databases to obtain business reports, to sort, to add, and to categorize data are some examples of combination processes. The Internalisation quadrant accounts for the creation of tacit knowledge by using explicit knowledge, which is shared across the company. Companies innovate or learn when this new knowledge is shared in socialization processes such as training programs for its employees. Through reading training manuals and policy documents employees internalise the explicit knowledge, and they can create new knowledge after this internalisation process (Nonaka, 1995).

KM, in this SECI model, can then be described as a set of activities that helps a company to acquire knowledge from both inside and outside of the company. Following the publication of this seminal SECI model there have been many KM models (sometimes called life-cycle models) and frameworks with different approaches and outlooks that have appeared in the literature. McAdam and McCreedy (1999) have identified three broad categories of KM models, namely knowledge category models, intellectual capital models, and socially constructed models. These models and frameworks are important to enrich our understandings of the essentials of KM activities. Yet they do not provide an integrated perspective for actual KM implementation in practice because not all of these models and frameworks focus on the KM field itself (Jafari, 2009). Some of these models and frameworks will be discussed and critiqued in Chapter two.

The kinds of strategies and tools that promote KM or knowledge sharing stem from the specific company, and help to achieve its goals. Strategies require detailed planning and hard work to make them work. Companies expect to utilise the knowledge provided through KM to help them accomplish their goals. Some authors indicate that when implementing KM, companies adopt different approaches to match their strategic missions (Malhotra, 2000). In other words, KM is a strategic tool for companies.

Although the literature is quite thin on linking knowledge management strategy (KMS - see 1.6) with wider corporate or company strategy, it is fair to infer its relevance from observing a company's application of KM activities (Zack, 1999). A company that manages knowledge well has the potential to create significant value only if this is linked to its overall strategy, and its strategic decision-making processes. KM has indeed become a strategy for increasing competitiveness (Bell and Jackson, 2001). In spite of this, there is still speculation that KM is a fad and possibly a fading endeavour. This speculation stems from different sources, and they include concerns that KM is driven by frameworks and strategies that fail to take into account factors such as the behaviour and perspectives of the users of knowledge, the historical and cultural contexts of companies, the size of companies, and so forth. This KM tension between 'promoting competitiveness' and 'passing fad' compels the need for further investigation.

Most KM models and frameworks present KM best practices but they fail to address the contextual differences between organisations. As a result, Cruywagen *et al.*, (2008: 101) maintain, KM initiatives often fail "and fuel the fear that KM is simply just another passing fad". To account for these contextual differences, they emphasise the need for KM models and frameworks to shift their focus from the need for a best-practice approach to a best-fit approach. The two approaches are based on KM models and frameworks with different characteristics. The implication is that the KMS strategy changes according to the KM model or framework adopted by a company (See 2.4.5).

A significant contextual concern raised in a best-fit approach to KM models, frameworks, and strategies is the failure to recognise sufficiently all aspects of the knowledge behaviour of users. Kruger (2005: 65) underscores the centrality of the link between knowledge behaviour and the knowledge user in the following way:

"The challenge for today's professional (all professionals) is to identify the knowledge that is needed to optimise the achievement of organisational objectives, *who it is needed by, how it will be used*, its sources and how it flows through the organisation and between the organisation and its external environment." (Original emphasis)

Kruger's observation still reveals an implicit instead of an explicit focus on all aspects of the knowledge behaviour of the user. What is more striking in the KM literature is that the process of

knowledge seeking is either subsumed or overlooked in the standard list of KM processes (create; identify, share; acquire; use; store – See 2.3 and 2.10 for fuller discussions). In other words, the knowledge seeking process is manifestly under-theorised in the KM literature (King, Chung & Haney, 2008; Lai and Graham, 2009). There is therefore a clear and urgent need to address this gap in the KM literature. This study will investigate the theoretical status of the knowledge seeking process (See 1.6 for a working definition), and link it with the closely related process of knowledge sharing to conceptualize a KM model or framework that integrates knowledge seeking as a significant KM process. Such a framework will provide the basis for designing a more effective KMS for the long term benefit of the company.

In order to address this gap in the KM literature, the theoretical component of this study will investigate the need to consolidate the status of the knowledge seeking process in KM models and frameworks. The empirical component of this study will support the theoretical component by statistically describing knowledge seeking and knowledge sharing practices in a sample of companies. Together, the two components will help to factor the knowledge seeking process into KM models and frameworks, and to guide the design of a best-fit KMS for a company. Although there is still a gap in the KM literature on knowledge seeking, the theoretical basis for knowledge and information seeking in the cognate discipline of Library and Information Science (LIS) is more well-established, and will be helpful for the purposes of this study. By drawing on these and other sources, it will become clearer how knowledge seekers in a company actually search for, find, and share knowledge.

In the LIS literature, references are more usually to information than to knowledge, but these terms are closely related, and explicit knowledge is often equated with information. Many authors say that knowledge is tacit and that as soon as knowledge moves into the realm of the explicit it becomes information. This discussion is taken up in greater detail in Chapter two. At this point, however, it is well worth pointing briefly to some of the relevant features of user information-behaviour as found in the LIS literature. Factors that affect information seeking behaviour include personal motives, the kinds of information being sought, the sources, and the ways in which needed information is sought (Leckie *et al.*, 1996). Information-seeking behaviour is expressed in various forms, from reading printed material to research and experimentation.

Information users actively and intentionally seek up-to-date information from print-based resources and electronic sources (Bhatti 2009). Some studies investigating the information-seeking behaviour of scholars and academics noted that 85% of the respondents relied on their personal collections as a major source for information for teaching and research (Bhatti, 2009:3).

Wilson (1996) states that the root of the problem of information-seeking behaviour is the concept of information need. This concept has proved difficult to grasp because a need is a subjective experience that occurs only in the mind of the person in need and that, consequently, is not directly accessible to an observer. The experience of need can only be discovered by deduction from behaviour or through the reports of the person in need. The general concept of need is, of course, a psychological concept since it refers to a mental state or states and a great deal of attention has been given to the idea, its subjective character, and the motivation for the expression of need or the physiological drives that result in the expression of need (Wilson, 1996: 4). Morgan and King (1971) claim that needs emerge from three kinds of motives, namely:

- physiological motives (for example, hunger and thirst);
- unlearned motives (including curiosity and sensory stimulation); and
- social motives (such as the desire for affiliation, approval or status, or aggression).

Wilson (1996) explores the place of information needs in information system design. He states that it has been disappointing to discover that systems designers are more concerned with how computers are used than with how the user actually processes information. The interest of system designers appears to be almost entirely in the area of how the computer interfaces (screen, mouse, keyboard) can be designed to provide the user with a more effective means of navigating the system (Wilson, 1996: 6). This insight is useful for the KMS literature where the emphasis has fallen more strongly on bringing strategies in line with the needs of the organisation as whole, and with the expectation that the seekers of knowledge themselves should adapt instead of adapting the strategies to the behaviour and needs of knowledge seekers.

This study aims to show that developing a KM model or framework that takes in account knowledge seeking and sharing behaviour will enable a company to design a KMS that leverages the actual and existing knowledge seeking practices of employees. This will make for a better, if

not best-fit, scenario. Knowledge seekers are expected to seek, share and create knowledge, and it is proposed in this study that a knowledge seeking-oriented model or framework will accommodate insights into how knowledge seekers actually do so. In order to test this proposition and achieve the aims of this study, a number of research questions become necessary.

1.2 Research questions and research sub-questions

The following main research question and research sub-questions are posed to guide this investigation.

1.2.1 Main Research Question

- How can the process of knowledge seeking be integrated into a KM model or framework, and the design of a KMS for a company?

1.2.2 Research sub-questions

- To what extent does knowledge seeking feature in KM models, frameworks, and strategies?;
- What can be learned from the cognate discipline of LIS about knowledge seeking that is relevant for KM models, frameworks, and strategies?; and
- What are the main features of knowledge seeking and knowledge sharing in a sample of companies?

1.3 Research methodology

This study consists of a theoretical component and an empirical component. The research methodology will combine quantitative and qualitative approaches, and draw on secondary and primary sources. Other features of the research design will be discussed more fully in Chapter 3.

1.3.1 Theoretical component

A literature review will be conducted to provide an appropriate theoretical basis for the empirical component of the investigation. The importance and value of a literature study is apparent from the statement made by Mouton (2001:180) that: “A comprehensive and well-integrated literature review is essential to any study. It provides you with a good understanding of the issues and debates in the area that you are working in, current theoretical thinking and definitions, as well as previous studies and their results.” The literature study will collect secondary sources such as KM papers, journal articles, and books to evaluate a selection of KM models and frameworks, and KMS. The special focus of the literature review will be a qualitative assessment of the theoretical status of the knowledge seeking process.

1.3.2 Empirical component

The empirical component will use descriptive statistics to reveal some features of the knowledge seeking and knowledge sharing processes in a sample of several companies.

1.3.2.1 Target Groups

Company A is a small business intelligence consulting company that focuses on high-end market products. The projects of the professional consultants involve planning, implementing, and maintaining various business intelligence products and systems. Most projects are long-term, but there are several *ad-hoc* short-term projects.

Company B is an IT department located within a larger company. The employees of the department are responsible for the IT infrastructure of the organisation. Their tasks range from physically installing machines to setting up users on the system and resolving IT related issues. The department requires knowledge about systems and procedures to be stored and easily communicated or shared with new employees for faster induction into the department.

Company C is an insurance company that deals with claims and that calculates insurance rates and fees. The company is country-wide and consists of offices spread across the entire country, but for this study only the Johannesburg-based branch was included.

Company D is a Netherlands-based company that deals with first-line support for certain kinds of financial software. The company works with organisations all over the world, and is involved with remote support. It also provides onsite support if required, and offers various training courses related to the software.

1.3.2.2 Data Sampling

The sample method adopted in this study is purposeful sampling. Purposeful sampling is ideal for this study as it provides a sample of information-rich participants. The sample sizes are dependent on the size of the target groups, which are described above.

1.3.2.3 Data collection

Data will be collected through questionnaires. The questionnaires will consist of closed and open-ended questions that probe the features of knowledge seeking and knowledge sharing in a sample of companies.

1.4 Benefits of the study

The study will:

- Propose a KM model or framework that includes knowledge seeking as an integral process of KM;

- Examine the interactions between knowledge seeking and knowledge sharing processes in a sample of companies; and
- Present a best-fit KMS for a company that takes into account the interactions between knowledge seeking and knowledge sharing.

1.5 Limitations of the study

The study will:

- Not be generalisable to all South African companies because of the sample size and because of the use of descriptive statistics. The findings may however be useful to other companies in the country, and guide further research on this topic;
- Not take into account the interactions of knowledge seeking with other KM processes, and will restrict itself only to the interaction with knowledge sharing; and
- Not investigate all themes related to knowledge seeking such as learning theories, learning styles, and so forth.

1.6 Explanation of key terms used in the study

End User - the ultimate user for which something is intended

(<http://wordnetweb.princeton.edu/perl/webwn>: Accessed 30/09/2010)

Information - The meaning that a human assigns to data by means of the known conventions used in their representation. (http://www.its.bldrdoc.gov/projects/devglossary/_information.html: Accessed 30/09/2010)

Information Technology – In the broadest sense, information technology refers to both the hardware and software that are used to store, retrieve, and manipulate information.

(<http://www.mariosalexandrou.com/definition/information-technology.asp>: Accessed 04/11/2009)

Knowledge – understanding of or information about a subject which a person gets by experience or study, and which is either in a person's mind or known by people generally

(<http://cambridge.dictionary.org>: Accessed 04/11/2009)

Knowledge management – Strategies and processes designed to identify, capture, structure, value, leverage, and share an organization's intellectual assets to enhance its performance and competitiveness. It is based on two critical activities: (1) capture and documentation of individual explicit and tacit knowledge, and (2) its dissemination within the organization. (<http://www.businessdictionary.com/definition/knowledge-management.html>: Accessed 04/11/2009)

Knowledge Management Model/Framework -A KM framework explains the world of KM by naming the major KM elements, their relationships and the principles of how these elements interact. It provides the reference for decisions about the implementation and application of KM. (Heisig, 2009: 5)

Knowledge management strategy – A knowledge management strategy is simply a plan that describes how an organisation will manage its knowledge better for the benefit of that organisation and its stakeholders. A good knowledge management strategy is closely aligned with the organisation's overall strategy and objectives. (<http://eclkc.ohs.acf.hhs.gov.html>: Accessed 30/09/2010)

Knowledge seeking – Given its weak development in the KM literature, only a working definition of knowledge seeking, based on the ideas of Lai and Graham, can be given here. Knowledge seeking in organisations is an experiential learning process that results in the improvement of the seeker's knowledge structure to solve problems or satisfy some goal. This definition emphasises the cognitive process of knowledge construction by knowledge seekers through information seeking, sense-making, and learning by doing, by experiences, or by problem solving (Lai & Graham 2009: 471).

User - A person who makes use of a thing; someone who uses or employs something (<http://wordnetweb.princeton.edu/perl/webwn>: Accessed 30/09/2010)

1.7 Outline of the Study

This study is divided into six chapters of which the content and scope are as follows:

Chapter 1 – Introduction

The introduction provides the background of the study, poses the research questions, and briefly explains the benefits and limitations as well as the key terms used in the study.

Chapter 2 – Literature Review

The Literature review examines the key secondary sources of the topic, with a specific focus on knowledge seeking and its theoretical status in KM models, frameworks, and strategies.

Chapter 3 – Research Methodology

The chapter on research methodology explains how the study was conducted in terms of the target groups, sampling procedures, and the methods used to collect and analyse the data.

Chapter 4 – Analysis and Interpretation of the Data

This chapter presents the data and provides an analysis and interpretation of patterns or themes that emerge from the data.

Chapter 5 - Proposal

Chapter 5 proposes a KM model or framework and a KMS based on the data from the analysis and interpretation in the previous chapter.

Chapter 6 – Conclusion

This chapter presents the findings, recommendations, and suggestions for further research.

1.8 Conclusion

This chapter introduced the overall framework of the study through a discussion of the background of the problem, research questions, research methodology, as well as the benefits and limitations and the key terms used in the study. Chapter 2 will examine the KM literature with a special focus on the theoretical status of the knowledge seeking process.

Chapter 2 Literature Review

2.1 Introduction

This chapter will examine key concepts relevant to the research topic, and present discussions of definitions of knowledge, KM, KM models/frameworks, KM strategies, and KM tools. A special focus is whether and how knowledge seeking features in KM literature.

2.2 Knowledge

In his article entitled ‘The five-tier knowledge management hierarchy’, Hicks *et al* (2006, 20) offer several definitions of knowledge used in the KM field. They include:

- The power to act and make decisions (Kantner, 1999);
- Information in context coupled with an understanding of how to use it (Davenport and Prusak, 1998);
- Professional expertise appropriate for the domain (Bourdreau and Couillard, 1999);
- Things that are held to be true and drive people to action (Bourdreau and Couillard, 1999);
- Justified personal belief that increases an individual’s capacity to take effective action (Alavi and Leidner, 1999);
- Information that has been authenticated and thought to be true (Vance, 1997);
- Integrated information in context (Galup *et al.*, 2002);
- Information made actionable (Maglitta, 1996); and
- Information made actionable in a way that adds value to the enterprise (Vail, 1999).

Following the lead of Michael Polanyi’s first division of tacit and explicit knowledge in 1958, some commentators contend that knowledge exists only inside the human mind (Nonaka, 1994). This is similar to the concept expressed by Churchman (1972) that knowledge of human beings resides in the user alone and not in the collection (Hicks *et al*, 2006). One can easily be confused

by the range of definitions as they all seem similar and appear to address the same issue. Any attempt to understand knowledge in the context of KM should start with its original meaning.

Webster's dictionary defines knowledge as follows:

- “(1) the fact or condition of knowing something with familiarity gained through experience or association (2): acquaintance with or understanding of a science, art, or technique **b** (1): the fact or condition of being aware of something (2): the range of one's information or understanding <answered to the best of my *knowledge*> **c**: the circumstance or condition of apprehending truth or fact through reasoning”
(Merriam-Webster online dictionary)

This definition gives insight into the fact that knowledge is something which is intangible in nature. It is a mix of experience and understanding. Questions that arise include: ‘Can one actually manage knowledge?’ and ‘How does one manage someone’s understanding and experience?’ One cannot manage knowledge physically and literally, but this does not mean however that one cannot foster the creation of knowledge, or the ability of someone to gain experience and understanding or even facilitate the successful transfer and sharing of knowledge. Polanyi first developed the ideas of tacit and explicit knowledge. His (1969) article, “The logic of tacit interference”, is frequently cited as the first comprehensive exploration of the concept of tacit knowledge, and as a key source for KM (Wallace, 2007). Polanyi explained aspects of tacit knowing in detail, with the central theme that tacit knowing cannot be stated explicitly. He uses the example of riding a bicycle, saying that it might not be possible to explain the nature of the process or the skill that one possesses.

Polanyi (1969) also states that it is quite possible to acquire new knowledge without actually being able to state explicitly what is now known that was previously not known. His original distinction of tacit and explicit knowledge is worth quoting directly: “While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is either tacit or rooted in tacit knowledge; a wholly explicit knowledge is unthinkable” (Polanyi, 1969: 144). Polanyi also provides examples to understand tacit knowledge better. These include the following:

- Tacit knowledge is personal in origin, each person has his/her own way of doing something or reason to want to know something;
- Tacit knowledge is valuable to the possessor; it goes without saying that an individual's internal knowledge will be valuable to the possessor, but the possessor will also have obtained and be in possession of a large volume of trivial knowledge; and
- Tacit knowledge is difficult to articulate although it might be possible for like-minded individuals to articulate tacit knowledge for the purpose of sharing tacit knowledge.

(Wallace, 2007: 19)

Polanyi (1969) elaborates the characteristics of tacit knowledge that many KM researchers, such as Nonaka, have used in their own theories of tacit and explicit knowledge and in their models and frameworks of KM.

2.3 Knowledge management

Wallace (2007: 1), in his book *Knowledge Management: Historical and Cross-disciplinary themes*, states that knowledge management is “the effective management of the sharing and retention of information in an organisation; the use of management techniques to optimise the acquisition, dissemination, and use of knowledge”. Wallace maintains that the intellectual origins of knowledge management are both deeper and broader than the explorations that have appeared in the literature to date, and he adds that the influences of philosophy, economics, education, psychology, information and communication studies and library and information studies have been almost completely overlooked. Furthermore, the historical background of KM thought and practice is either exaggerated or condensed (Wallace, 2007). Wallace claims that there are no standardised, accepted definitions of KM in the sense of consensus-based dictionary and encyclopaedia definitions.

A practical way of dealing with this anomaly has been to look at the six KM processes identified by Heisig (2009: 10) as the most frequently used terms in KM models and frameworks, which are to:

- Create;
- Identify;
- Share;
- Acquire;
- Use; and
- Store.

These are all part of the gaining of new understandings or experiences to expand one's knowledge base. It is worth noting that knowledge seeking or searching is excluded as a KM process in Heisig's list (See 2.8.1.1). It is true that the processes of codifying, sharing, and organising are primarily focused on information management. However, it is also true that the underlying basis of knowledge management is information management. Streatfield and Wilson (1999: 70), for example, claim that: "Knowledge management encompasses both the management of information and the management of people. Knowledge cannot be managed directly – only the information about the knowledge possessed by people in organisations can be managed".

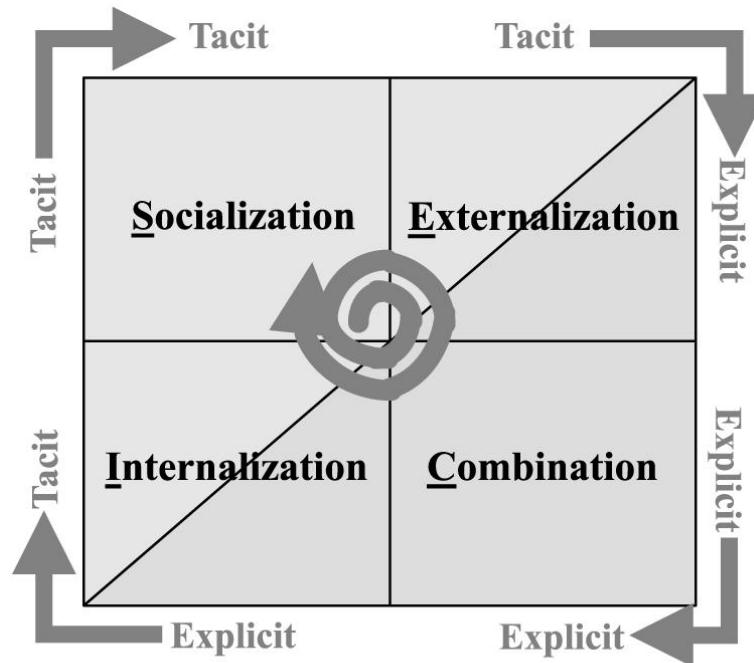
The point is that a knowledge manager needs to build an environment that will encourage people to create new knowledge, to share it, use it, and so forth. The challenge is to develop an environment that fosters the creation and sharing and using of knowledge freely and readily. This idea of KM was first popularised in Nonaka's SECI model. It should be noted that knowledge seeking as a key process in KM is overlooked or implied rather than openly acknowledged and recognized in the models and frameworks that are reviewed in this chapter. A simple example of its importance, however, is that personal motives for seeking knowledge may affect the decision either to share or not to share knowledge with others. Also, knowledge can be sought for gaining personal understanding and not necessarily for the purpose of competitiveness. The under-emphasis or absence of knowledge seeking will be highlighted in the following discussions of KM models/frameworks, strategies, and tools.

2.3.1 Nonaka and Takeuchi's SECI Model

There are many KM models and frameworks. More than 160 around the world have already been identified, and there is a call to harmonise the many disparate frameworks with its wide range of diffuse terms (Heisig 2009; See 2.8.1.1). For this reason, only a few well-known models and frameworks will be selected for evaluation here. Nonaka and Takeuchi (1995) popularised knowledge management with their article, "The knowledge creating company". Wallace (2007) indicates that Nonaka and Takeuchi are the most frequently cited authors in the domain of knowledge management, and that their article is one of the most influential in the field of KM. Nonaka and Takeuchi (1995) begin with an explanation of the fundamental differences in thought patterns between the Japanese people and people in Western countries.

Many authors have drawn on the work of Polanyi (1969), but Nonaka and Takeuchi extend his ideas with a view to applying their own interpretations. Nonaka and Takeuchi divide tacit knowledge into two 'dimensions'. The technical dimension is encapsulated in the term 'know-how', which correlates closely with Polanyi's statement, "we know more than we can tell" (Polanyi, 1964: 4). The cognitive dimension "consists of schemata, mental models, beliefs, and perceptions so ingrained that we take them for granted" (Wallace, 2007: 31). This corresponds with Polanyi's ideas of tacit knowledge, and from this stemmed the model for which Nonaka and Takeuchi are well known, namely the SECI Model (See Figure 1).

Figure 1: The SECI Model



The Socialisation quadrant focuses on tacit to tacit knowledge linking. Nonaka and Takeuchi (1994) state that new knowledge is created by using the processes of interactions, observing, discussing, analysing, spending time together or living in the same environment. Socialisation is also known as converting new knowledge through shared experiences. Organisations gain new knowledge from outside its boundary also while interacting with customers, suppliers and stakeholders. This occurs in traditional environments where a son would learn the technique of wood craft from his father by working with him (instead of reading books or manuals). The externalisation process focuses on tacit to explicit knowledge linking, according to Nonaka and Takeuchi (1994). It helps in creating new knowledge as tacit knowledge comes out of its boundary and becomes collective group knowledge. The process of externalisation is often driven by metaphor, analogy and models. An example is Quality Circles formed in manufacturing sectors where workers use their learning and experience to improve or solve process-related problems. (All KM.com, 2004)

Combination, as described by Nonaka and Takeuchi (1994), is a process where knowledge transforms from explicit knowledge to explicit knowledge. An example could relate to a finance department that collects all financial reports from each department and publishes a consolidated annual financial performance report. Creative use of databases to get business reports, sorting, adding, and categorizing are some examples of combination processes. There are many products available to do this, such as Oracle OBIEE or business intelligence. Internalisation occurs when explicit knowledge is created using tacit knowledge and is shared across the organisation, according to Nonaka and Takeuchi (1994). When this tacit knowledge is read or practiced by individuals, it broadens the learning spiral of knowledge creation. Organisations try to innovate or learn when this new knowledge is shared in the Socialization process, and when they provide training programs for their employees at different stages of their work. By reading training manuals and documents, employees internalise the tacit knowledge and try to create new knowledge (All KM.com, 2004)

Although the model encompasses the shift in KM from tacit to explicit, and from explicit back to tacit, there have been many who have criticised the model. Snowden (See 2.3.2) states that the ‘two by two’ model of Nonaka and Takeuchi was merely his attempt to reflect Western culture instead of being fixated on the Japanese idea of ‘oneness’. However, the model was too well-established by 1998 when Nonaka published a paper to correct any misunderstanding of his intentions. One may add other criticisms to the SECI model such as the exclusion of cultures other than the Western and the Japanese. From the point of view of this study, the key omission is why, how, and where users would seek and share knowledge. In summary, the emphasis in the SECI model falls too heavily on knowledge creation, with no mention of knowledge seeking.

2.3.2 Snowden’s Cynefin Model

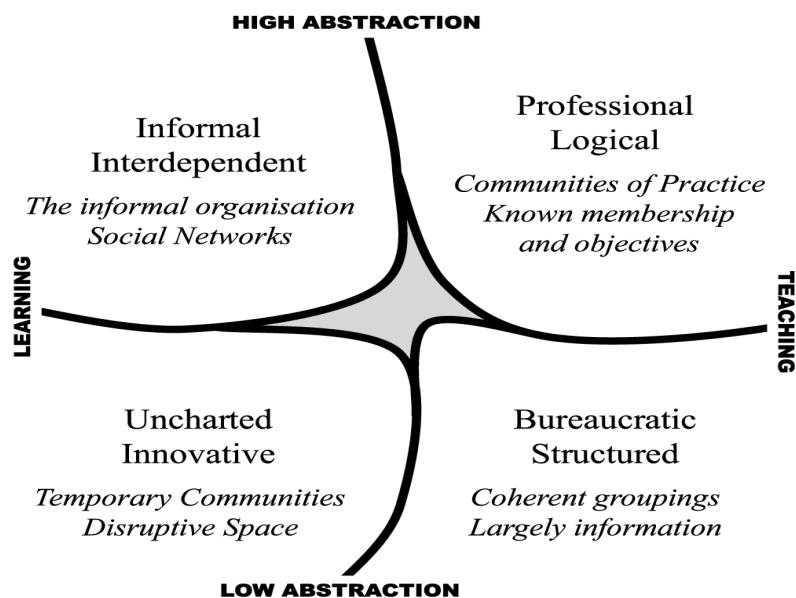
Snowden (2002) explains that there are three ages of knowledge management. The first age is ‘information for decision support’, which was prior to 1995. In this age, Snowden sees knowledge as being managed, but the world itself was not yet problematic. The focus was on the flow and the appropriate structuring of information for decision makers. The second stage emerged around 1995 with the popularisation of the SECI model and its focus on the movement

of knowledge between tacit and explicit states. He claims that we are in the third age at present and explains this age as the ‘paradoxical nature of knowledge’. In this age, some of the basic concepts underpinning KM were challenged. “Knowledge is not a thing, or a system, but an ephemeral and active process of relating” (Snowden, 2002: 101). He identifies three heuristics that illustrate the change in thinking required to manage knowledge:

- First, knowledge can only be volunteered, it cannot be conscripted;
- Second, we always know more than we can tell, and we will always tell more than we can write down; and
- Third, we can only know what we know when we need to know it.

Snowden’s (2002) own model is called the Cynefin model (See Figure 2). Snowden explains the word Cynefin as a Welsh word with no direct English equivalent. As a noun, it is translated as a ‘habitat’, and as an adjective as ‘acquainted’ or ‘familiar’ (Snowden, 2002).

Figure 2: The Cynefin Model



The Cynefin model creates four open spaces or domains of knowledge, as Snowden (2002) explains, and all have validity in different contexts. They are domains and not quadrants as they create boundaries within a centre of focus, and they do not pretend to encompass all possibilities

(Snowden, 2002). Snowden tried to portray a more fluid and dynamic version of the Nonaka and Takeuchi model. He maintained that knowledge models cannot be confined to quadrants, and so the Cynefin model uses domains that are fluid. Each domain has its own definition and explanation.

The Bureaucratic/Structured domain is considered a teaching and low abstraction domain. This is the formal organisation and the realm of company policy, procedures, and controls. It is a training environment and its language is known, explicit, and open. It is the legitimate domain of the corporate intranet and its shared context is the lowest common denominator of its target audience's shared context.

The Professional /Logical domain is a teaching and high abstraction domain and is commonly the professional individuals who, through defined training programmes, acquire a specialist terminology that is codified in textbooks. The high level of abstraction is teachable given the necessary time, intelligence and opportunity. This is one of the most important domains as knowledge communication is at its most efficient due to the high level of abstraction. In second generation thinking, this is the domain of communities of practice (Snowden, 2002: 11).

The Informal/Interdependent domain is a learning and high abstraction domain. In this domain we have the abstraction of shared experiences, values, and beliefs. This is the domain of informal organisation, or complex network of obligations, experiences and mutual commitments without which an organisation could not survive. Trust in this domain is a naturally occurring phenomenon as all collaboration is voluntary in nature. The ability to convey high levels of complexity through stories lies in the highly abstract nature of symbolic associations in the observer's mind when s/he hears the story. It triggers ideas, concepts, values and beliefs at an emotional and intellectual level simultaneously. Its simplest manifestation can be a coded reference to past experience. For example, "You're doing a Barney" may be praise or blame. Without context the phrase is meaningless whereas within a context a dense set of experiences is communicated in a simple form. (Snowden, 2002: 12).

'Uncharted/Innovative' is a learning and low abstraction domain in which we have neither the experience nor the expertise because the situation is new. This is the ultimate learning environment. The organisation will tend to look at such problems through the filters of past experience. The history of business is littered with companies that failed to realise that the world had changed. In hindsight, such folly is easy to identify, but at the time the dominant language and belief systems of the organisation concerned make it far from obvious. This is particularly true where the cost of knowledge creation within the organisation is high as this leads to knowledge hoarding and to secrecy, which in turn can blind the organisation to new and changed circumstances. Here we act to create context to enable actions through individuals or communities who have either developed specific understandings, or who are comfortable in conditions of extreme uncertainty. Such individuals or communities impose patterns on chaos to make it both comprehensible and manageable (Snowden, 2002: 12).

Although the Cynefin model adapts the SECI model to become more sophisticated regarding the transfer of knowledge through teaching and learning, there is no sustained focus on knowledge seeking behaviour.

2.3.3 Prusak's Origin of KM model

Prusak's (2001) model proposes that KM originated from three sources. First, social and economic trends relating to globalisation have led to the world being viewed as one large network. In this situation, a knowledge-centric view of the firm prevails and means that there is a realisation of the importance of knowledge. Second, disciplines such as philosophy, economics, psychology, and sociology have contributed in some way or another to KM ideas and concepts. Third, practices such as information management, human resource management and quality management have contributed to the origin of KM (Prusak, 2001). He appears to focus on the sources and origins of KM instead of its processes. Even though knowledge seekers are implied in areas like information management, and human resource management, there is no clear and definite emphasis on how, why, and where they seek knowledge.

2.4 Knowledge strategy and Knowledge Management Strategy

There is a difference between a knowledge strategy (KS) and a knowledge management strategy (KMS). Van der Spek & Hofer-Alfeis (2002) use the analogy of a roadmap to distinguish between them. A KS indicates what one needs in order to achieve one's goals. A KMS indicates how one is going to get there. It can almost be compared to type of action plan stating what tools are needed and what processes are needed in order to achieve one's goals. They state that a KS is used as a dedicated instrument by business owners and their management teams to plan, implement, and control management actions concerning business-related knowledge. A KS identifies which knowledge areas have an impact on the business, how strong that impact is, which deficits there are in each of the knowledge areas in terms of proficiency, codification and diffusion (distribution), and determines what the management feels it can do in response to the situation (Van der Spek & Hofer-Alfeis 2002).

Von Krogh *et al* (2001: 426) define a KMS as “The employment of knowledge processes to an existing or new knowledge domain in order to achieve strategic goals”. A KMS, according to Van der Spek & Hofer-Alfeis (2002: 26) is a ‘roadmap’ for knowledge managers (CIO; CKO; etc.), and “their cross business responsibilities to enable knowledge management”. This identifies a KMS as an action plan that we put in place to achieve our goals. Bater (1999) supports the distinction between a KS and a KMS. He says that a KS takes account of what is to be handled – knowledge and information – and charts a route from the starting point to the desired destination, weighing up the pros and cons of each alternative. A KMS is a plan that describes how an organisation will manage its knowledge better for the benefit of that organisation and its stakeholders. A good KMS is closely aligned with the organisation's overall strategy and objectives (National electronic library for health, 2004). A few well-known KMSs will be discussed to discover if they address knowledge seeking behaviour.

2.4.1 Hansen *et al*

These authors capture the crucial role of a KMS in the following quotation: “Some companies automate knowledge management; others rely on their people to share knowledge through more traditional means. Emphasizing the wrong approach – or trying to pursue both at the same time – can quickly undermine your business.” (Hansen *et al.*, 1999: 106) They focus on two views of KMS, namely Codification and Personalization (See Figure 3).

2.4.1.1 Codification Strategy

In some companies, the KMS revolves around IT. Knowledge is carefully codified and stored in databases where it can be accessed and easily used by anyone in the company. This is called the *codification* strategy. Over the past five years, organisations have developed elaborate ways to codify, store, and re-use knowledge. Knowledge is codified using a ‘people-to-documents’ approach. It is extracted from the person who developed it, made independent of that person, and then re-used for various purposes. This approach allows many people to search for and retrieve codified knowledge without having to contact the person who originally developed it. It opens up the possibility of achieving scale in knowledge re-use and thus of growing the business (Hansen *et al.*, 1999: 108).

2.4.1.2 Personalization Strategy

In other companies, knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts. The chief purpose of computers at such companies is to help people to communicate knowledge, instead of storing it. This is called the *personalization* strategy (Hansen *et al.*, 1999). The focus is on dialogue between individuals, not on knowledge objects in a database. Knowledge that has not been codified and probably could not be codified is transferred in brainstorming sessions and through one-on-one conversations. Participants collectively arrive at deeper insights by going back and forth on problems they need to solve. To make their personalization strategies work, organisations invest heavily in building networks of people. Knowledge is shared not only in face-to-face situations but also over the

telephone, by e-mail, and via videoconferences. Organisations can foster networks in many ways, namely by transferring people between offices; by supporting a culture in which consultants are expected to return phone calls from colleagues promptly; by creating directories of experts; and by using ‘consulting directors’ within the organisation to assist project teams (Hansen *et al.*, 1999: 109).

Figure 3: Hansen *et al.*'s – Personalization vs. Codification Table

How Consulting Firms Manage Their Knowledge		
CODIFICATION		PERSONALIZATION
Provide high-quality, reliable, and fast information-systems implementation by reusing codified knowledge.	Competitive Strategy	Provide creative, analytically rigorous advice on high-level strategic problems by channeling individual expertise.
REUSE ECONOMICS: Invest once in a knowledge asset; reuse it many times. Use large teams with a high ratio of associates to partners. Focus on generating large overall revenues.	Economic Model	EXPERT ECONOMICS: Charge high fees for highly customized solutions to unique problems. Use small teams with a low ratio of associates to partners. Focus on maintaining high profit margins.
PEOPLE-TO-DOCUMENTS: Develop an electronic document system that codifies, stores, disseminates, and allows reuse of knowledge.	Knowledge Management Strategy	PERSON-TO-PERSON: Develop networks for linking people so that tacit knowledge can be shared.
Invest heavily in IT; the goal is to connect people with reusable codified knowledge.	Information Technology	Invest moderately in IT; the goal is to facilitate conversations and the exchange of tacit knowledge.
Hire new college graduates who are well suited to the reuse of knowledge and the implementation of solutions. Train people in groups and through computer-based distance learning. Reward people for using and contributing to document databases.	Human Resources	Hire M.B.A.s who like problem solving and can tolerate ambiguity. Train people through one-on-one mentoring. Reward people for directly sharing knowledge with others.
Andersen Consulting, Ernst & Young	Examples	McKinsey & Company, Bain & Company

2.4.2 von Krogh *et al*

Von Krogh *et al* (2001) bring together a range of KMSs from which companies can develop their own (See Fig 4). They are discussed below:

Figure 4: von Krogh *et al.*'s Types of Strategies

		Knowledge process	
		Transfer	Creation
Knowledge Domain	Existing	Leveraging strategy	Expanding strategy
	New	Appropriating strategy	Probing strategy

2.4.2.1 The Leveraging strategy

The leveraging strategy represents existing knowledge and knowledge transfer processes. This strategy concentrates on transferring existing knowledge to the rest of the organisation. The leveraging strategy is orientated towards achieving efficiency in operations as well as reducing risks in operations. It ensures the company's internal transfer of existing knowledge from various knowledge domains. Improved efficiency results from the local adaptation of cost-effective processes and services invented and developed elsewhere (von Krogh *et al.* 2001). This is in line with the best-practices approach. An example of this is where there are many branches in an organisation and the need for better procedures and efficiency. This is achieved when one branch or division has a cost saving or efficient process that is shared throughout the entire organisation to extract the full benefit from the 'best practice'. By sharing knowledge in this way and building upon trust between the participants, the risk of repeating mistakes and 're-inventing the wheel' is significantly reduced, and creativity and entrepreneurship are nurtured (von Krogh *et al.* 2001: 427).

2.4.2.2 The Expanding Strategy

The expanding strategy emphasises the creation of new knowledge that is based on the existing data, information, and knowledge of the organisation. The focus here is on expertise that could come from partner firms, or partner firms could provide data, information and knowledge in order to fuel the knowledge creation process. The process occurs in various knowledge-creating groups throughout a company. This happens through the use of an existing knowledge domain, and can be achieved by combining new and existing explicit knowledge, by creating new product and service concepts based on tacit knowledge, or by socialising members through problems, tasks, and work processes (von Krogh *et al.* 2001: 430).

2.4.2.3 The Appropriating strategy

The appropriating strategy is predominantly an externally orientated strategy. Here, the key challenge is to build up a new knowledge domain by transferring knowledge from external sources. Appropriation can occur through acquisitions or strategic partnerships with selected companies, research institutions, universities, and other external organisations. The appropriating strategy can help to achieve operational efficiencies. The appropriating strategy also helps to attain innovation goals. Innovation with a partner is a common strategy for companies. The partner company provides market, manufacturing, and product knowledge that can provide a unique platform for building up new knowledge, products, and services internally. The appropriating strategy can also be translated into concrete learning targets for the company. A new group must be given the responsibility for building up the new knowledge domain, but with a focus not so much on creating knowledge within the firm as building the domain by capturing and transferring knowledge from partners. The appropriating strategy also helps to manage risk. By capturing new knowledge from the external environment, rather than developing it in-house, the risk of overtaxing resources decreases (von Krogh *et al.* 2001: 432).

2.4.2.4 The Probing Strategy

The probing strategy gives one or several teams the responsibility to build up a new knowledge domain from scratch. Here, knowledge creation is different from the case of the expanding strategy. In the expanding strategy, key professionals have already been identified for an existing knowledge domain. Also, available knowledge can be judged for its relevance to expand the domain. The probing strategy requires a different approach. Here participants with an interest in doing something new in the company are identified, and these individuals build their own community around a loose idea or vision of a future knowledge domain (von Krogh *et al.* 2001). In some ways, these individuals become ‘corporate revolutionaries’ who create knowledge that can become imperative for the long-term performance and survival of the firm. This strategy has a twofold impact on strategic goals. First, it may contribute to achieving innovations. Second, it can help the company see business processes and tasks in a new light, and thereby have some impact on the efficiency goals (von Krogh *et al.* 2001: 434).

2.4.3 Day and Wendler

Day and Wendler (1998) identified five knowledge strategies employed by large corporations:

- **Developing and Transferring Best Practices**

This strategy focuses on identifying best practices within an organisation and spreading them across a dispersed network of locations.

- **Creating a new industry from embedded knowledge**

This approach recognises that an organisation may have knowledge that it can exploit in new ways. In particular, it builds up knowledge about its customers that reveals a gap in the market for a new product.

- **Shaping Corporate Strategy around knowledge**

This strategy was developed from the experiences of Monsanto, which consisted of two very different business groups, namely a chemicals group and a life sciences group. The chemicals group focused on best practice while the life sciences group was an innovation-based business. The KMSs for these two groups were so different that Monsanto decided to sell off the chemicals group and concentrate on the life sciences business. This is an interesting example of the tensions between very different KMSs.

- **Fostering and Commercialising Innovation**

This strategy is similar to the Knowledge Creation Strategy, and focuses on establishing a competitive position through increased technological innovation and reduced time to market.

- **Creating a standard by releasing proprietary knowledge**

Netscape is cited as an example of response to the rapid decline of its market share in the Internet browser market by making its source code publicly available at no cost. The strategy is an example of the 'Intellectual Asset Management Strategy'. In this case, Netscape felt that it could capitalise on a key asset (its source code) by giving it away. In return, it hoped to establish its browser as a widely used standard and to gain indirectly by securing its share of a complementary product, namely, server software (Day and Wendler, 1998: 3).

2.4.4 Zack

Zack (1999) proposes a framework which helps an organisation make an explicit connection between its competitive situation and a KMS to establish and maintain its competitive advantage. He makes it clear that although each organisation will find its own unique link between knowledge and strategy, any such competitive knowledge can be classified on a scale of innovation relative to the rest of that particular industry as: *core*, *advanced*, or *innovative*:

- Core knowledge is a basic level of knowledge required by all members of a particular industry. It does not represent a competitive advantage, and is simply the knowledge needed to be able to function in that sector;
- Advanced knowledge gives an organisation a competitive edge. It is specific knowledge that distinguishes an organisation from its competitors either by knowing more than a competitor or by applying knowledge in different ways; and
- Innovative knowledge is that which enables a company to be a market leader. It allows an organisation to change the way a sector works and represents a significant differentiating factor from other organisations (Zack, 1999: 133).

Having identified the organisation's competitive knowledge position, Zack's approach is to use a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) to identify the strategic gaps in an organisation's knowledge. This allows the organisation to identify where it has knowledge that it can exploit and where it needs to develop knowledge to maintain or grow its competitive position. This is achieved, according to Zack (1999), by analysing the organisation's knowledge position along two dimensions:

- Exploration vs. Exploitation

This is the degree to which the organisation would need to increase its knowledge in a given area vs. the opportunity that it would have to leverage existing but under-exploited knowledge resources.

- Internal vs. External Knowledge

This refers to whether the knowledge is primarily inside or outside the organisation. Some organisations are more externally-oriented, and draw on publications, universities, consultants, customers, etc. Others are more internally-oriented, and build up unique knowledge and experience which is difficult for competitors to imitate. (Zack, 1999: 136).

All the KMSs discussed above stress people and users of knowledge through concepts such as networks, experts, consultants, professionals, participants, and so forth. There is still a strong emphasis, however, on how they process, create, share, and communicate knowledge, and little

about how they seek knowledge. The process of knowledge seeking in relation to these KM processes are not explicated or addressed adequately.

2.4.5 Cruywagen *et al* and best-fit approaches

Cruywagen *et al* (2008) argue that a best-fit approach to KM models and frameworks, and therefore to designing a best-fit KMS, recognises differences in the contexts between organisations. Systems thinking, in their view, is useful to deal with the idea of context and they examine five key concepts of systems theory that can be used as criteria for best-fit approaches:

- “A system is an integrated whole consisting of parts. Translated to the context of knowledge management, this means that knowledge management could be viewed as a system consisting of parts, or a subset of knowledge management activities which could lead to a prescriptive framework” (Cruywagen *et al*, 2008: 102). A knowledge life-cycle is a typical example of a prescriptive framework and an example is Nonaka and Takeuchi’s (1995) model;
- “A second systems concept says that the parts of an integrated system are organised around a specific purpose. In the knowledge management context this means that knowledge management activities are organised to achieve specific organisational goals. A knowledge management framework therefore should establish a link between knowledge management activities and organisational goals or objectives” (Cruywagen *et al*, 2008: 102);
- “A third systems theory concept is that the whole is larger than the sum of its parts. This means the characteristics of a system (the whole) emerges from the configuration of relationships or interdependencies of the parts. The properties of a system can therefore not be understood by looking at the parts independently - the focus needs to be on the relationships between the parts and with the whole” (Cruywagen *et al*, 2008: 102). A KM

framework cannot therefore be discussed in terms of some of its KM components, but should consider relationships and interdependence between all the components;

- “A fourth concept borrowed from systems theory is that a system is a whole in its own right, but also part of one or more larger wholes. This means that any system should be viewed in the context of its parts, which are systems themselves, as well as the larger system it forms part of. In terms of knowledge management this means that knowledge management should not only be viewed in terms of its underlying activities, but also in terms of the organisation in which it is or will be deployed” (Cruywagen *et al*, 2008: 103). Any KM framework, in the light of this concept, should therefore be context-sensitive; and
- A fifth systems theory concept is that systems co-produce each other. This means that a system is co-produced by factors present in other systems. In terms of knowledge management this means that knowledge management is not only shaped by its underlying knowledge management activities, but also by factors belonging to other systems, for example the industry within which an organisation operates, organisational structures and leadership, to name a few” (Cruywagen *et al*, 2008: 102). This raises issues of culture, leadership, and organisational performance.

Cruywagen *et al* believe that best-practice models and frameworks are prescriptive about what practices and procedures organisations should follow. On the other hand, best-fit approaches would consider the organisation as a whole, its internal and external environments, and its relationships with other organisations before recommending the most suitable approach. Using this holistic approach of systems thinking, they develop a knowledge-centric framework which they argue is aligned with the characteristics of a best-fit approach.

Although their case study is not convincing and their multi-method methodology appears to be disconnected from systems thinking, they do make the important point about sensitivity to context and the need to consider KM in wider contexts. Although they state that a KM

framework cannot be discussed in terms of some of its components, but should consider relationships and interdependence between all the components, they fail to identify knowledge seeking as another important component of the KM framework.

2.5 Information technology and knowledge management

In addition to KMSs, companies need to consider also the tools needed to promote successful knowledge sharing. The question surrounding tools is often a sensitive subject as it evokes a discussion of IT-managed KM and people-managed KM (See 2.4.1). However, IT is a vital component of KM. The IT needs for KM provoke a number of questions:

- “How to encourage more dialogue among employees?”
- How to encourage better interaction between and amongst staff and clients?
- How to find out who knows what I need to find out more about something?
- How to find out what should I be reading to find out more about something?
- How to find out where is a particular item of information or knowledge within the firm?
- How to find out who would benefit from communicating with whom?”

(Stevedenning.com, 2003)

IT can be a tremendous catalyst to KM and knowledge sharing, if a company is well-resourced and IT is implemented properly. It can provide an extensive knowledge base that is of immediate use. The World Wide Web is a good example of IT that can either be very effective or a nuisance by creating information overload. Some tools are based on sharing knowledge and others on creating knowledge. Among the issues that need to be considered in providing IT for knowledge sharing programs are:

- **Responsiveness to user needs:** continuous efforts must be made to ensure that the information technology in use meets the varied and changing needs of users;
- **Content structure:** in large systems, classification and cataloguing become important so that items can be easily found and quickly retrieved;
- **Integration with existing systems:** it is key to integrate knowledge-related technology with pre-existing technology choices; and

- **Synchronization** of technology with the capabilities of users is important so as to take full advantage of the potential of the tools, particularly where the technology skills of users differ widely. Knowledge sharing programs that focus on the simultaneous improvement of the whole system, both technology tools and human practices, are likely to be more successful than programs that focus on one or the other. (Stevedenning.com, 2003).

A noteworthy problem is that KM and knowledge sharing programs are often confused with some form of IT system or technology. Technology is an enabler, and while technology and tools makes things possible, it is people that make things happen. Even with the modern tools the process of knowledge transfer is not always accomplished, according to Denning (2003), since those who have the knowledge “may not be conscious of what they know or how significant it is, or be able or willing to share it with others. Thus know-how is ‘sticky’ and tends to stay in people’s heads”. Denning’s caveats are useful when considering IT tools in KM.

2.6 Knowledge management tools

Some of the common technologies that are used in conjunction with KM include:

- Lotus notes;
- Knowledge directories (Yellow pages);
- Knowledge repository (Databases); and
- Portals.

2.6.1 Lotus notes

Lotus Notes is an application suite that includes the following components:

- e-mail;
- calendaring and scheduling;
- address book;
- database;

- web server; and
- Programming.

Unlike other application suites that split these pieces of functionality into separate products, Lotus Notes presents these components using a single front-end. For many people, Lotus Notes is an e-mail system. While this is not necessarily its main strength as a product, e-mail is probably its most recognizable component. It has most or all of the features of the other popular e-mail products on the market, including calendaring and scheduling. For all practical purposes though, everything in Notes is a database. Individual users have their own e-mail databases, and different sets of users can share application databases that can display, add, or manipulate information. Besides data, a database can also contain modules of programming code that will perform background, scheduled, or on-demand tasks for a user. (Nsftools.com).

2.6.2 Yellow Pages

How can I ‘know who knows?’ None of us can personally know more than around 250 people, yet we want our companies to be smart, learning organisations where it is easy to find the right person to talk to. This is why many organisations create ‘yellow pages’ applications, which enable employees to find and contact other staff with particular kinds of expertise and skills (Webpronews.com, 2005).

2.6.3 Knowledge repository

An Organizational Memory or Knowledge Repository is a computer system that continuously captures and analyses the knowledge assets of an organization. It is a collaborative system where people can query and browse both structured and unstructured information in order to retrieve and preserve organizational knowledge assets and facilitate collaborative working. The focus of such systems tends to be on storing unstructured, but nonetheless still explicit, forms of knowledge such as unwritten local rules and procedures. The aim is to be able to retrieve data in a context-sensitive way rather than just through the use of simple keyword-based retrieval. Such systems might use techniques such as Social Network Analysis or collaborative filtering in order to provide the required ‘context’ for the data (ChrisKimble.com, 2002).

One of the main areas where knowledge repositories are extensively used is the ‘call centre’ or ‘help desk’.

The challenges in these areas can include:

- Potential wide range of customer queries;
- High staff turnover;
- Pressure to reduce call handling times; and
- Accountability for information provided to customers (Step Two Designs, 2002).

Knowledge repositories are often used to solve or assist in addressing these challenges. If implemented properly and maintained efficiently, knowledge repositories can be used to reduce training time and costs for new staff, improved call handling times, and fewer calls to second level support (Step Two Designs, 2002).

2.6.4 Portals

A portal, also known as an enterprise information portal (EIP), is a framework for integrating information, people, and processes across organizational boundaries. It provides a secure access point, often in the form of a web-based user interface, and is designed to aggregate and personalize information through application-specific portlets. One hallmark of enterprise portals is the de-centralized content contribution and content management, which keeps the information always updated (The Intranet Portal Guide).

The IT tools discussed above emphasise knowledge seeking more than the KM models and frameworks and KMSs do. They tend to ask questions such as ‘who knows what I need to find out more about something?’ and, ‘how do I find out where in the company a particular item of information or knowledge is that I need?’ It is still the case, however, that the user or knowledge seeker is obscured by the range of IT tools themselves. There is clearly a need therefore to focus in a sustained way on the user’s knowledge seeking behaviour.

2.7 Knowledge and information seeking behaviour

The aim of this study is to design a new way of thinking about KM models and frameworks and KM strategies, namely to integrate knowledge seeking behaviour into them. In other words, the focus falls on the knowledge seekers in a company or an organisation to understand how, why, where and when they seek knowledge. Users do seek, create, and share knowledge in different ways, but knowledge seeking and the ways in which this relates to other KM processes are still inadequately addressed in the KM literature. There is, however, a considerable body of relevant knowledge in the cognate discipline of Library and Information Science (LIS) that may be helpful to KM. It is therefore well worth examining the LIS literature on knowledge and information seeking behaviour. Although the standard reference in LIS is to information seeking, the relations between information and knowledge are well-documented.

Information is closely related with explicit knowledge and the two concepts are often equated. Experts claim that knowledge is only tacit and that as soon as knowledge moves into the realm of the explicit it becomes information. There is therefore a close relation between the two concepts, and debates about this relation still persist about where knowledge stops being knowledge and becomes information, and vice-versa. A recent example of this debate is a letter by Hjørland (2009: 643) challenging Bates' critique of his views of information and knowledge. The continuing debate indicates that this matter remains unresolved.

2.7.1 Insights from LIS literature

There are many views and approaches to the key concepts of information behaviour and information seeking in LIS. Stillwell (2010) reviewed the research on information behaviour in a South African context and indicated an enormous growth in the number of articles and papers from 2000 onwards. Stillwell also identifies a divide in the literature between the themes of information behaviour and information searching and retrieval. She states that "the literature on information behaviour shows that the concept has developed over time and many approaches are put forward for particular contexts and situations" (Stillwell, 2010: 2). For Case (2002: 13),

context in information behaviour is “the particular combinations of person and situation that serves to frame an investigation”. It is evident from Stillwell’s review that many conceptual and theoretical frameworks for information behaviour have emerged since 1980. For the purposes of this study, however, the pioneering work of Wilson (2000) on information behaviour is considered most appropriate and will be discussed in greater detail.

Wilson (2000: 49-50) gives the following definitions:

- “Information behaviour is the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use”. It includes face to-face communication with others, as well as the passive reception of information as in, for example, watching TV advertisements without any intention to act on the information given;
- Information seeking behaviour is purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a library), or with computer-based systems such as the World Wide Web;
- Information searching behaviour is the ‘micro-level’ of behaviour employed by the searcher in interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human computer interaction (for example, use of the mouse and clicks on links) or at the intellectual level (for example, adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent places on a library shelf is most useful), which will also involve mental acts, such as judging the relevance of data or information retrieved ; and
- Information use behaviour consists of the physical and mental acts involved in incorporating the information found into the person's existing knowledge base. It may therefore involve physical acts such as marking sections in a text to note their importance or significance, as well as mental acts that involve, for example, comparison of new information with existing knowledge.”

Wilson notes that: most studies until the mid-1970s were concerned with system use rather than user behaviour; they identified the types of information sources used by scientists and engineers;

and what these sources were used for was not explored. Since the 1980s, he maintains, there has been a shift away from a 'system-centred' approach towards a 'person centred' approach. This was accompanied by a switch from quantitative methods to qualitative research methods in information seeking. The key figures associated with this change, according to Wilson, include Ellis, Dervin and Kuhlthau. Wilson's experience of information seeking in this very practical context led him to develop a model of information seeking behavior that is initiated by the individual's physiological, cognitive, and affective needs.

More recently, Bhatti (2009: 2) elaborates that:

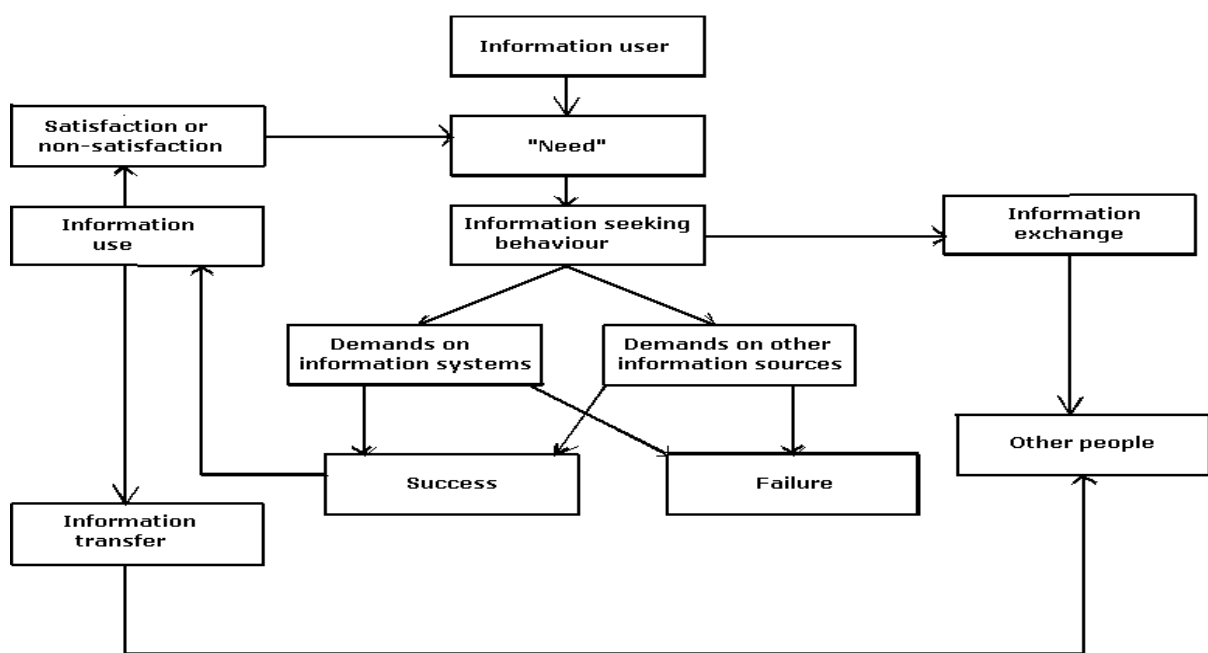
“Factors that affect information seeking behaviour include personal reasons for seeking information, the kinds of information being sought, and the ways and sources with which needed information is being sought. Information- seeking behaviour is expressed in various forms, from reading printed material to research and experimentation. Information users make active and intentional attempts to seek up-to-date information from the library resources, including electronic sources”.

The concept of an 'information need' is the key problem in information-seeking behaviour (Wilson, 1996). An information need is a skewed experience which occurs only in the mind of the person in need and is not always directly understood by an observer. Wilson (1996) adds that the experience of need can only be discovered by deduction from behaviour or through the reports of the person in need. The general concept of information need is, of course, a psychological concept since it refers to a mental state and a good deal of attention has been given to its subjective character, the motivation for the expression of a need, and the physiological drives that result in the expression of need (Wilson, 1996).

Wilson (1996) also explored information needs in computer systems and information systems design. He is disappointed that systems designers are less concerned with how information is processed than with how computers are used. This can be applied to the KMS literature too, where strategies are more in line with the organisation as whole and aim to conform users to strategies instead of conforming strategies to the needs of the users. Information-seeking behaviour must be based upon some general model of 'information behaviour', of which information-seeking behaviour is a part. Wilson's (1981) model (See Figure 5) locates the

concepts of information need, information seeking, information exchange, and information use in a flow diagram that can be seen as charting the behaviour of an individual faced with the need to find information. This model has been developed and updated in a number of subsequent articles, but it remains essentially the same. It is worth noting that the central location of information seeking in the model emphasises that it is at the heart or core of information behaviour.

Figure 5: Wilson's (1981) information behaviour model



Another commentator, Talyor (1968), provides some insights into the practical processes of information seeking that is relevant for KM. He discusses four levels of information needs. The first level of information need is the conscious or unconscious need. This need for information is probably inexpressible in linguistic terms and analogous to Polanyi's notion of tacit knowledge, although Polanyi was more concerned with what an individual knows than what is not known. The second level of information need is a conscious mental description of an ill-defined area of indecision. The individual might talk to someone about the need to sharpen focus but it will not satisfy the information seeker (Taylor, 1968).

The third level of information need is when the information seeker can formulate a qualified and rational statement of his/her question or information need. In the fourth level of information need the information seeker recasts the question in anticipation of what the information can deliver. Taylor's primary goal was to create an evidence-based analysis of what happens when an individual needs and eventually seeks information. Wallace (2007) maintains that although Taylor explored levels of information need in the context of libraries and information centres, the results are applicable to many information-seeking environments, and hence relevant also for knowledge seeking in a KM environment.

In 1989, Ellis investigated and modelled the information-seeking behaviour of academics across the social sciences, physical sciences, and among engineers and research scientists. A more recent study on social scientists by Meho & Tibbo (2003) re-examined Ellis's findings in order to see if they were still applicable in an electronic information-seeking environment. These and other recent studies confirmed similar information seeking behavioural characteristics (Makri, 2008). The information seeking behavioural characteristics are listed by Ellis *et al* (1993: 395) as follows:

- “Starting – activities characteristic of the initial search for information is to obtain an overview of the literature within a new subject field, or to locate key people operating in this field;
 - Monitoring - Maintaining awareness of developments and technologies in a field through regularly following particular sources;
 - Browsing - Semi-directed searching in an area of potential interest;
 - Chaining - Following chains of citations or other forms of referential connections between material;
 - Differentiating - An activity which uses differences between sources as a filter on the nature and quality of the material examined;
 - Extracting - Systematically working through a particular source to identify material of interest;
 - Verifying - Checking the information and sources found for accuracy and errors.
- Information managing – filing, archiving, and organizing information collected or used in facilitating their research; and

- Ending - The assembly and dissemination of information or the drawing together of material for publication.”

It is self-evident that these characteristics cannot be carried over to the KM environment in a straightforward and simplistic way. At the same time, it would be short-sighted to ignore the lessons learned in the cognate discipline of LIS over a long period of sustained empirical investigation, and to overlook the similarities with some of the recent work in KM.

2.8 Knowledge seeking insights from recent KM literature

Only recently has there been some research into knowledge seeking behaviour in the KM literature. This topic was largely overlooked, and studies concentrated on issues like IT based systems for knowledge sharing without a connection with knowledge seeking as a relevant and distinctive KM process (Alavi & Leidner, 2001). This topic is however beginning to emerge, and a small number of recent KM articles on knowledge seeking discuss some of its features. In 2005, Sharma and Bock argued that knowledge seeking is as an aspect of knowledge sharing in the same way that knowledge contribution is an aspect of knowledge sharing. They claim that just as contribution is important, so too knowledge re-use is equally important in knowledge sharing and that it connects with knowledge seeking. They investigated the factors such as attitudes and intention that influence an individual’s knowledge seeking behaviour in an electronic knowledge repository (Sanjeev & Gee-Woo, 2005).

He, Fang, and Wei (2009) examined the role of trust in knowledge seeking and its links with knowledge sharing and knowledge contribution. They argue that “trust has been widely recognised in many studies as an important enabling factor for seeking knowledge; however, the role of trust in promoting knowledge-seeking behaviour using knowledge management systems has not been adequately addressed” (He *et al*, 2009: 4). Their examination of the KM literature revealed that most of the research focused on the system or the framework of the KM system, and failed to identify the reasons why individuals used a system, or not. “Trust is a crucial enabling factor in almost any type of social interaction. Considerable evidence has shown that

trusting relationships lead to greater knowledge exchange” (He *et al*, 2009: 5). Guha *et al* (2004: 403) also state that “A user is more likely to believe statements from a trusted acquaintance than from a stranger”, which affirms the conclusion of He *et al* that trust can be considered to be an important social factor in knowledge seeking behaviour and that it involves trust in the entire community of users instead of individuals.

This emphasis on people is evident also in Hsieh’s (2009) research on ‘human centric knowledge seeking strategies’, in which he identifies knowledge stakeholders as external customers, internal supportive staffs, and co-workers as bearers of tacit knowledge. Hsieh identifies methods that knowledge seekers use to obtain knowledge from the knowledge stakeholders. He believes that knowing who the knowledge stakeholders and leveraging their knowledge are crucial for the firm's benefit. Hsieh identifies methods like eavesdropping and observation. These methods relate to issues of trust in knowledge seeking, and are relevant to a KM system and a KM strategy.

2.8.1 Knowledge seeking in KM models and frameworks

Various KM models (sometimes described as life-cycles models) and frameworks have been created over several years of KM research and development. Many are not well-known while a few have featured prominently in the KM world, namely those of Nonaka and Snowden. Some models and frameworks introduce new KM features while others are additions or adaptations of existing models. Recent overviews include knowledge seeking as a new focus.

2.8.1.1 Heisig

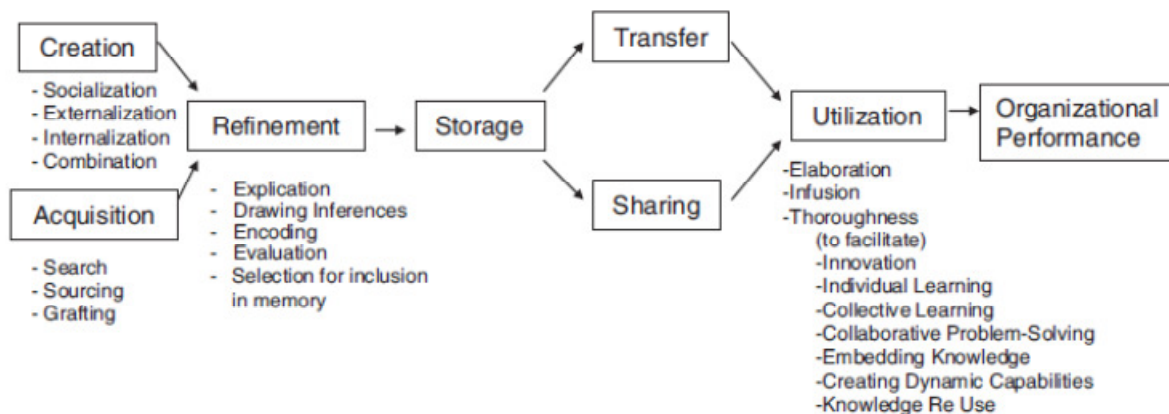
Heisig compared 160 KM frameworks around the globe in an attempt to standardise the KM terms and harmonise and consolidate KM concepts. Heisig (2009: 4) examined the “use and understanding of the term knowledge, the terms used to describe the knowledge process activities and the factors influencing the success of knowledge management”. He found an underlying consensus on the basic categories in spite of the wide diversity of terms (for activities and processes) used to represent those categories in KM frameworks. More relevant to this study,

knowledge seeking is not identified explicitly as a category, neither as a term in the 160 KM frameworks. A few terms like ‘searching’, ‘locating’, ‘gathering’ and ‘sourcing’ in the six main KM categories come closest to the idea of knowledge seeking. There is therefore very little more than a hint of knowledge seeking in this comprehensive review. It is still inadequately addressed as a process or activity, or in relation to other processes such as knowledge sharing. There are, however, a few recent articles that bring knowledge seeking into sharper focus.

2.8.1.2 King, Chung and Haney

King, Chung and Haney’s KM cycle model (2008) is based on a review of more than 68 studies. They believe that despite progress in KM over the last decade, a large number of topics are still under-researched. The authors argue for greater consensus with regard to all the models and frameworks. They draw on the standard life-cycles models and frameworks like those of Nonaka and Takeuchi, Davenport, and Prusak to create their version of a KM cycle model (See Figure 6).

Figure 6: King, Chung and Haney’s (2008) KM cycle model



This cycle model shows the cumulative nature of model making and the way that new models build on older models in order to introduce new features of KM. Knowledge seeking is not

explicit in this model but the idea is located with the process of acquisition. Searching (as on the internet), sourcing (selecting the source to use), and grafting (adding an individual who has the desired knowledge to the organization) contain elements of knowledge seeking, but they are not explicit and do not cover all aspects of knowledge seeking. This seminal model is adapted by Lai and Graham, who have progressed furthest in developing knowledge seeking in the KM literature.

2.8.1.3 Lai and Graham

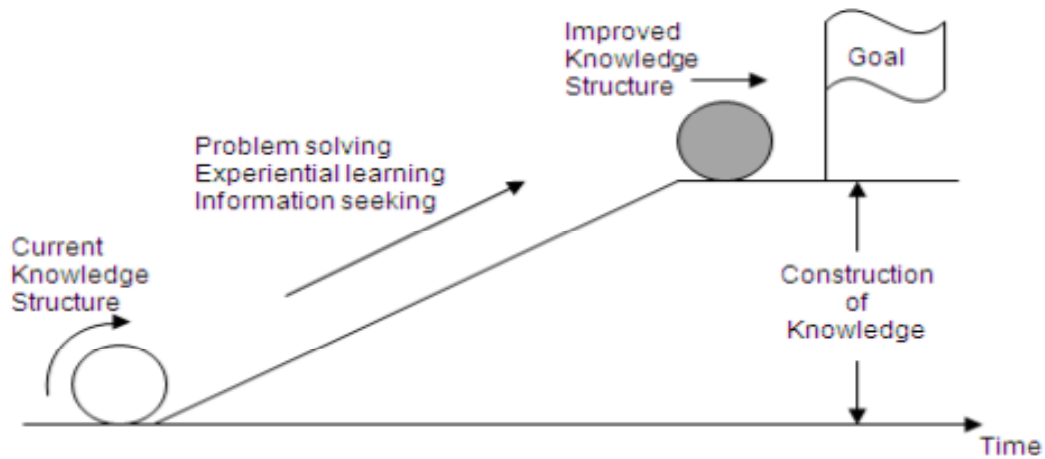
Han Lai and Margaret Graham (2009) offer the most convincing argument for the importance of knowledge seeking in KM. They presented their conference paper at the 10th European Conference of Knowledge Management (ECKM) in 2009, and used the cycle model of King, Chung, and Haney to present an adapted KM cycle model that emphasizes knowledge seeking. They distinguish between information seeking and knowledge seeking, as well as the differences between the knowledge seeker and the knower. After reviewing several KM models and frameworks, they introduce knowledge seeking as a new concept in KM, and propose an adapted KM cycle to represent their ideas.

Lai and Graham argue that knowledge seeking is essentially a learning process, and a crucial part of KM. They acknowledge earlier work on knowledge seeking by researchers like Sanjeev & Gee-Woo (2005), as well as Lin *et al* (2006) but argue that they make little distinction between knowledge seeking and information seeking. For them, knowledge seeking is about knowledge existing somewhere and knowledge seekers mean to seek or find it out. This, in Lai and Graham's view (2009: 466), is no different from information seeking. In other words, most KM researchers see knowledge as a noun and try to capture and store it outside the human mind and share it in organizations (Lai and Graham 2009: 469). This conception is dominant in KM and represents the mainstream view in the field. It has been described as an objectivist perspective of knowledge, located within a neo-functionalist discourse (Hislop, 2009: 10, 30). In this view, KM focuses on codification, and the collection of knowledge in a central repository, and information technology plays a key role.

Knowledge seeking is, however, about an individual in the workplace constructing knowledge through problem solving and experiential learning. Lai and Graham review several ways of knowing, and select the constructivist approach as most appropriate for knowledge seeking. The knowledge seeker constructs knowledge for and by himself/herself. This happens when the individual encounters a problem in the workplace which triggers the learning process. Learning occurs from trying to solve the problem, and from experience. This conception is more closely connected with a practice-based perspective of knowledge, located within a constructivist discourse (Hislop, 2009: 10, 33). In this view, knowledge is embedded in human activity or work practices, and sharing and acquisition through social interaction and through watching and doing are emphasised.

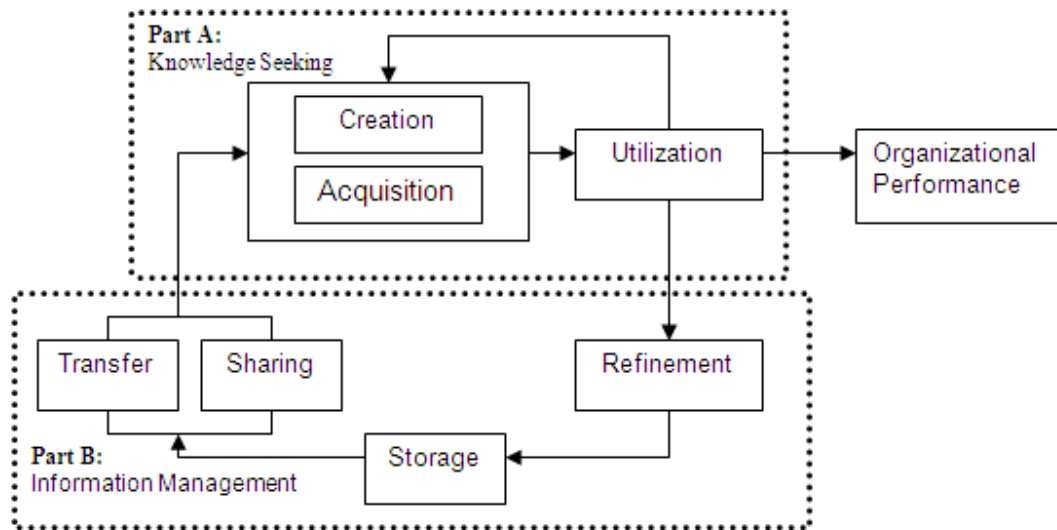
Simply having more information does not lead to knowledge; knowledge is constructed by the knowledge seeker in the process of solving problems and learning from experience. They state (2009: 470) that “knowledge is created or constructed on the basis of ‘pull’ by individuals (knowledge seekers)”. For them, knowledge seeking is part of the “demand pull” action and is the foundation of KM. Knowledge sharing, on the other hand, is a “supply push” action that belongs with information management. Knowledge seeking in the workplace can then be summed up as an experiential learning process that improves the seeker’s knowledge structure to solve problems or satisfy some goal (See Figure 7)

Figure 7: Lai and Graham's Knowledge construction in the workplace



Using these ideas, Lai and Graham adapt King, Chung and Haney's cycle model and group the KM processes of creation, acquisition, and utilization under knowledge seeking. Transfer, sharing, storage and refinement are placed with information management. Their model is split into two blocks, namely knowledge seeking and information management (See Figure 8).

Figure 8: Lai and Graham’s (2009) Adapted KM cycle model



In this model, refinement is an activity that “selects, codifies or reduces knowledge to information”; storage is “actually a database, a book, or some objects that store this information”; and transfer is actually “information” transfer. But utilization is “committed by individuals who have received helpful information and constructed it into their own knowledge structure by a learning process, that is an act knowing” (Lai and Graham 2009: 471). ‘Creation’ and ‘acquisition’, taken from the King, Chung and Haney cycle model, are added to ‘utilisation’ in the knowledge seeking block.

They admit that their model is illustrative and not definitional. It is still evolving and being tested in the field, but it does provide one way forward to understand the important process of knowledge seeking and its impact on organizational performance. They locate organizational performance with the knowledge seeking block, but fail to expand on this. Knowledge sharing is located in the information management block as a process that is not the essence of real knowledge management. These are provocative claims that Lai and Graham make but they cannot be fully assessed here. This dissertation will proceed to describe some of the features of knowledge seeking in practice, and elaborate some implications for, and limitations of, Lai and Graham’s adapted KM cycle model.

2.9 Conclusion

A review of the KM literature has revealed that knowledge seeking has not been adequately addressed. The references to knowledge seeking are either implicit or they are unsatisfactory. The standard KM models and frameworks, and KM strategies do not factor knowledge seeking into their discussions. The following can therefore be said about these models, frameworks, and strategies:

- The emphasis falls too heavily on knowledge creation and the conversion from tacit to explicit knowledge in Nonaka and Takeuchi's SECI model (See 2.3.1);
- There is no sustained focus on knowledge seeking behaviour in Snowden's Cynefin model (See 2.3.2);
- Knowledge seeking is implied, but it is unclear how, why, and where knowledge is sought, in Prusak's Origins model (See 2.3.3);
- Knowledge seeking is merely suggestive in Hansen's personalisation and codification KM strategies (See 2.4.1); and
- There are veiled references to knowledge seeking in the 160 KM models and frameworks reviewed by Heisig, but no explicit acknowledgement of knowledge seeking as an independent KM process (See 2.8.1.1).

Lai and Graham is the most productive source on knowledge seeking. Their adapted model is based on the standard frameworks and life-cycle models in KM literature, and incorporates the KM processes found in most other frameworks and life-cycle models. Their model does, however, have shortcomings and contradictions. Information seeking behaviour is located at the heart and centre of Wilson's information behaviour model as an independent component that connects with all other components of the model (See Figure 5). Knowledge seeking in Lai and Graham's model is connected with some KM processes but it is separated from information management as a block that contains other KM processes (See Figure 7). This separation contradicts their claim that knowledge seeking as learning can and does involve information seeking and an individual's use of material sources. At other points in their paper, they also say that in their model "information management becomes a part of knowledge management" and

that they are different (Lai and Graham 2009: 472). Knowledge seeking also appears to have a generic status encompassing the KM processes of creation, acquisition, and utilisation, instead of an independent status on the same level as those and other KM processes.

Their separation of knowledge seeking from knowledge sharing (in the Information Management block) suggests that sharing is only about externalized or explicit knowledge. This raises the question whether the two processes can be so sharply separated from each other and whether both processes cannot or do not occur together in practice. These shortcomings of the Lai and Graham model mean that, as they themselves concede, further work is necessary. Evaluations of their views of knowledge seeking as learning, and empirical tests of their model are necessary. These assessments will require further research that cannot be undertaken here, but a modest contribution to their model can be achieved through an empirical examination of some of the features of knowledge seeking. The following chapter will present the methodology to conduct the empirical investigation.

Chapter 3 Methodology

3.1 Introduction

This chapter discusses the various methods of data collection and analysis used for the purpose of the empirical component of this study. This component seeks answers to the research sub-question: “What are the main features of knowledge seeking and knowledge sharing in a sample of companies?” The broad themes investigated include: where respondents actually look for knowledge; where respondents look for knowledge when they are under the pressure of time; and where they would prefer to look for knowledge in ideal circumstances. The same themes are applied to questions about knowledge sharing. The empirical component also examines some of the characteristics of the Lai and Graham model (See Figure 7) such as the ways in which knowledge seeking and sharing are connected or separated, and their involvement of people and IT (repositories).

Data gathering is vital to research in order to have hard facts and evidence regarding issues being explored and discussed. A research design is a plan or strategy which proceeds from the underlying philosophical assumptions to specifying the selection of the respondents, the data gathering techniques to be used, and the data analysis to be done (Maree, 2007: 70). In this study, the research design draws on quantitative and qualitative approaches and research methods in order to answer the research questions posed in Chapter 1. The benefits and comparison of both approaches to research design are discussed below.

3.2 Quantitative and qualitative approaches

Quantitative research is a form of conclusive research involving large representative samples and fairly structured data collection procedures. Quantitative research assumes that data collected can be expressed in numbers (Struwig & Stead, 2001). Quantitative research generates statistics through the use of large-scale survey research, using methods such as questionnaires. Typically,

questionnaires fall under the umbrella of quantitative research. This type of research reaches many more people, but the contact with those people is much briefer than it is in qualitative research (Sanchez, 2006).

Qualitative research explores attitudes, behaviour and experiences through such methods as interviews or focus groups. It attempts to get an in-depth opinion from participants and usually involves fewer people. Babbie *et al.* (2001) describe qualitative research as an approach in social research that takes the insider perspective on social action as its point of departure. As their primary aim, studies using this approach attempt to describe and to understand rather than to explain human behaviour (Babbie *et al.* 2001). Qualitative measures are used to ascertain the viewpoints, feelings and thoughts of the participants (Sanchez, 2006).

Below is a table taken from Kumar (2005: 18) comparing the differences between quantitative and qualitative approaches to research.

Table 1 Comparison of quantitative and qualitative research

Difference with Respect to:	Quantitative	Qualitative
Underpinning philosophy	Rationalism: “That human beings achieve knowledge because of their capacity to reason” (Bernard, in Kumar 2005: 18)	Empiricism: “the only knowledge human beings acquire is from sensory experiences” (Bernard, in Kumar 2005: 18)
Approach to Enquiry	Structured/rigid/predetermined methodology	Unstructured/flexible/open methodology
Main purpose of investigation	To quantify extent of variation in a phenomenon, situation, issue etc	To describe variation in a phenomenon, situation, issue etc
Measurement of variables	Emphasis on some form of either measurement or classification of variables	Emphasis on description of variables
Sample size	Emphasis on greater sample	Fewer cases

Focus of inquiry	Narrow focus in terms of extent of inquiry, but assembles required information from a greater number of respondents	Covers multiple issues but assembles required information from fewer respondents
Dominant research topic	Explains prevalence, incidence, extent, nature of issues, opinions and attitude, discovers regularities and formulates	Explores experiences, meanings, perceptions and feelings
Dominant research value	Reliable and objectivity	Authenticity but does not claim to be value-free
Analysis of data	Subjects variables to frequency distributions, cross-tabulations or other statistical procedures	Subjects responses, narratives or observations data to identification of themes and describes these
Communication of findings	Organisation more analytical in nature, drawing inferences and conclusions, testing magnitude and strength of a relationship	Organisation more descriptive and narrative in nature

Different methodologies become popular at different social, historical and cultural times, and as in most things in life all methodologies have their specific strengths and weaknesses. Taking this into consideration, features of both approaches listed in Table 1 are used in this study. For example, the sample has a few cases; variables are both measured and described; the findings are both analytical and descriptive; and the emphasis is on reliability and objectivity.

A combination of qualitative and quantitative research methodologies is best suited for the purpose of this study because a knowledge management strategy best suited to the needs an organisation requires empirical support for people with different roles in that organisation. Quantitative research techniques can generate a large volume of empirical data on knowledge seeking and sharing activities reliably and quickly, and analyse and prepare the data for interpretation. Qualitative research techniques will be useful to interpret open-ended questions.

3.3 Target Groups and Sampling Procedure

There are four target groups. The target groups are: two business units or departments within larger companies; a regional department of a nation-wide company; and an international company.

3.3.1 Target Groups

This target group is a business unit within **Company A**, which is a small business intelligence consulting company that focuses on high-end market products. The projects of the professional consultants involve planning, implementing, and maintaining various business intelligence software products and systems. Most projects are long-term, but there are several *ad-hoc* short-term projects.

This target group is the IT department of **Company B**. The IT department is responsible for the IT infrastructure of the company. Tasks range from physically installing machines to setting up users on the system and resolving IT related issues. The department requires knowledge about systems and procedures to be stored and easily communicated or shared with new employees for faster induction into the department.

The target group in this case is the Johannesburg branch of **Company C**, which is an insurance company that discharges claims and calculates insurance rates and fees. The company operates nation-wide and has offices spread across the entire country.

This target group is **Company D**, a Dutch based company that deals with first-line support for certain kinds of financial software. The company works with organisations all over the world, and is involved with remote support. It also provides onsite support if required, and offers various training courses related to the software.

3.3.2 Sampling Procedure

The sample method applied in this study is purposeful sampling. Purposeful sampling is the process through which the most appropriate participants are selected in terms of the purpose of the study (Leedy & Ormrod 2005). The researcher decides on the criteria for selection, which involve:

- The idea of “desirable participants” (Henning, van Rensburg & Smit, 2004:71);
- Individuals or objects that will “yield the most information about the topic under investigation” (Leedy & Ormrod, 2005:145); and
- A particular case because it “illustrates some feature or process that is of interest for a particular study” (De Vos *et al.*, 2005:328).

Purposeful sampling is ideal for this study since it looks at those individuals seeking and sharing knowledge in the workplace. This is the case in the companies selected above, and since all of them engage in these processes, the researcher decided to include all employees in the target groups instead of selecting samples from each. This is therefore a population study of the target groups described in 3.3.1 because all the employees of the target groups are information rich participants. The numbers for each company are as follows:

- Company A population size – 20
- Company B population size – 15
- Company C population size – 33
- Company D population size – 25

This generates a potential target group of 95 respondents.

3.4 Data collection methods

Data collection methods are the procedures used to collect data and the techniques to process and analyse the data (Struwig & Stead 2001: 40). The data for this study will be collected through questionnaires, focussing on the features of knowledge seeking and knowledge sharing.

Secondary sources such as articles, journals, books, and electronic sources were used to prepare the questions. The principal aim of the questionnaires is to deal with the empirical component of this study.

3.4.1 Data collection through questionnaires

“A questionnaire is a written list of questions, the answers to which are recorded by respondents” (Kumar 2005: 126). Questionnaires enable a researcher to gather large amounts of quantitative data in a short period of time, while also allowing a fair amount of qualitative data to be collected by constructing open-ended questions for participants to interpret. A questionnaire obtains facts and opinions from people who are informed on the particular issue under investigation (de Vos, 2005).

3.4.2 Advantages and disadvantages of questionnaires

Kumar (2005: 130) and Collins *et al.* (2000: 195-196) list the following advantages and disadvantages of questionnaires:

Advantages

- Less expensive – they can be distributed by mail, or inserted into magazines or newspapers, thus saving time and money;
- Greater anonymity – they are particularly useful to investigate topics that are personal or sensitive, because the respondent can refuse to respond, and responses can remain confidential;
- The researcher can reach respondents who are geographically dispersed; and
- They can be distributed via the Internet or electronic mail, saving administration costs of mail (such as developing the instrument, the paper on which the questionnaire is printed, duplication and postage costs).

Disadvantages

- Response rate can be low;
- Response rate can be slow (people can take their time to return the questionnaires);
- No opportunity to clarify responses; and
- Responses cannot be supplemented with irrelevant information.

In this study, the questionnaires will be electronically mailed to company managers who will distribute them to the participants, and collect and return them to the researcher. In the case of email surveys there is no interviewer to explain the purpose of the study or to record the answers (Struwig & Stead, 2001). The questionnaire consists of 25 questions, divided into 4 sections. Section A is about the demographic details of the participants; Section B asks questions about knowledge seeking; Section C asks questions about knowledge sharing; and Section D wants to identify the knowledge management tools that employees prefer using (See appendix A).

3.5 Data Analysis

Data Analysis transforms gathered data into information through the process of analysis (Mouton, 2001: 108-109). Descriptive statistics are ideal for describing the basic features of the data in a study, and they provide simple summaries about samples and measures. Descriptive statistics will be used to organise, summarise, and visualise the data and to describe features of knowledge seeking and searching in the target groups. The Statistical Package for Social Scientists (SPSS) software will be used to analyse the closed questions and identify patterns that emerge. The open-ended questions will be analysed by categorising words and meanings.

3.6 Reliability and Validity

Joppe (2000: 1) defines reliability as: “The extent to which results are consistent over time... if the results of a study can be reproduced under a similar methodology, then the research

instrument is considered to be reliable”. Validity is about whether “the research truly measures that which it was intended to measure or how truthful the research results are... Researchers generally determine validity by asking a series of questions and will often look for the answers in the research of others” (Joppe 2000: 1). Reliability and validity will be addressed and evaluated in this study in the following ways:

- The questionnaire will be pre-tested with a few respondents with regards to content and detail;
- The questionnaire will be as comprehensible and explicit as possible;
- The identity of participants will be protected to persuade them to answer freely;
- The quantitative and qualitative approaches will be combined in a process of triangulation (Kelly, 1999). Methodological triangulation allows the weaknesses of one instrument to be overcome by the strengths of others. The KM literature, empirical data, and responses to open-ended questions will be compared to assure validity;
- The questionnaire was submitted to the University of Pretoria’s Research Ethics Committee for approval before it was administered.

These measures may not guarantee reliability and validity altogether, but they show the care with which data is treated to achieve integrity in the findings.

3.7 Limitations of the methodology

- The study is limited to a few companies, and the findings cannot be generalised. This is a descriptive study using descriptive statistics instead of inferential statistics, but the findings may be instructive to future researchers;
- The dissimilarities of the companies in respect of core activities and geographical location may affect knowledge seeking and sharing, but the main purpose is to find some commonalities of these processes and how they can help in the design of a best-fit KMS; and

- The study focuses on where employees seek knowledge. In order to investigate how they seek knowledge, it is necessary to use in-depth interviews to discover the learning styles (for example, oral, printed or visual, *et cetera*) of individuals as learners and knowledge seekers. Although this would be necessary to test Lai and Graham's model fully, it is beyond the scope of this study.

3.8 Conclusion

In this chapter, the research design was explained, the target groups were identified and sampling methods were explained. The data collection methods, ways of dealing with reliability and validity, and limitations of the methodology were also described. The data will be analysed and interpreted in the next chapter.

Chapter 4 Data analysis and interpretation

4.1 Introduction

Questionnaires were sent to four companies to obtain data in order to answer the question: “What are the main features of knowledge seeking and knowledge sharing in a sample of companies?” (See Appendix A). The approach used to find answers to this question was to structure the questions around three broad themes, namely: where respondents actually looked for knowledge; where respondents looked for knowledge when they were under the pressure of time; and where they would prefer to look for knowledge in ideal circumstances. The same themes were applied to questions about sharing knowledge.

The data from the questionnaires will be analysed and interpreted in this chapter. The purpose of data analysis in research methodology is to understand the various elements of the data by inspecting the relationships between concepts, constructs, or variables, and to see if there are any patterns or trends that can be identified or isolated, or to establish themes in the data (Mouton, 2001). In this case, and in line with the empirical aim of the study, this chapter will explore patterns and establish themes in knowledge seeking and knowledge sharing. More specifically, the chapter will compare the data with viewpoints and models on knowledge seeking found in the KM literature. The data will be analysed and interpreted in the order of each questionnaire item. The outcomes of this chapter will be a description of the main features of knowledge seeking and knowledge sharing, and their implications for Lai and Graham’s adapted cycle model.

The data from the questionnaires have been consolidated into a single data set instead of separate data sets for the companies. The data therefore represents knowledge seeking and sharing across all the companies instead of each individual company. At the same time, it should be admitted that Company D was dropped from the analysis because of the 25 questionnaires sent out, only 3 were returned. The response rates for the other companies were as follows:

- For company A, 20 questionnaires were sent out and 13 were returned, yielding a response rate of 65%;
- For company B, 15 questionnaires were sent out and 11 were returned, yielding a response rate of 73%;
- For Company C, 33 questionnaires were sent out and 19 returned, yielding a response rate of 57.5%.

The overall response rate is therefore 43 of 68 questionnaires for 3 companies, yielding a figure of 63%.

4.2 Demographic Data

Question 1 – Gender

Male	Female	Total
37	6	43

Only 14% of the respondents were female. The data on knowledge seeking and sharing will therefore be skewed towards males. It may be useful in a future study to discover if there are any gender differences in knowledge seeking and sharing in the workplace.

Question 2 – Age

21-30	31-40	41-50	51-60	60 – up	Total
15	21	4	3	0	43

The majority of respondents were between 21 and 40, with almost half of that number in their twenties. As with gender, the differences in knowledge seeking and sharing according to age would be an interesting study.

Question 3 - Number of years at company

Less than 1 year	2 - 3 years	4 - 6 years	7 - 10 years	10 years up	Total
7	8	7	13	9	43

About half (22) of the respondents have been at the company for more than 6 years. This means that there is a balanced representation of more experienced and less experienced seekers and sharers of knowledge. In sum, this sample of respondents can be described as primarily young males who are evenly balanced in their knowledge seeking and sharing experience in the workplace.

4.3 Knowledge Seeking

Question 4 was a multiple choice question in which employees were asked to select one or more ways that they seek knowledge. The data represented below shows the figures of the total number of selections for the various options for seeking knowledge.

Question 4 - Where do you seek knowledge to solve problems at work? Tick all relevant boxes.

Internet	Colleague	Data/knowledge repository	Book	Other
39	41	26	26	13

n=43

Almost all respondents said they use the internet and/or consult colleagues when looking for knowledge when they encounter problems in the workplace. Sixty percent consult knowledge repositories and books, while 23% use other sources. Colleagues are the greatest sources for seeking knowledge. The high figure for consulting colleagues confirms the human-centric quality of trust relationships in knowledge seeking (See 2.8). Individuals construct knowledge in their conversations about problems with their trusted colleagues. The near-rival source of the

internet suggests that it is preferred to the KM system of data and knowledge repositories. Some respondents identified training courses, forums and subscription services as other sources of knowledge.

Question 5 - How frequently do you find the knowledge you are looking for?

Never	sometimes	often	always	Total
0	4	26	13	43

Sixty percent of the respondents ‘often’ find the knowledge they are looking for to solve a problem or perform some or other function in their job. When this data is correlated with that of Q4, we see that colleagues successfully supply the answers needed to solve problems in the workplace. This reinforces both the continued use of colleagues as a first choice, and the importance of trust in knowledge seeking. That none of the respondents were ‘never’ unsuccessful in finding the knowledge they sought could indicate that knowledge seeking persists until answers to problems are found, confirming the ‘pull’ of knowledge seeking.

Question 6 - If you have limited time to find knowledge to solve problems in the workplace, where do you get it from?

Question 6 was a multiple choice question in which employees were asked to select one or more ways that they seek knowledge. The data represented below shows the figures of the total number of selections for the various options for seeking knowledge.

internet	Colleague	data/knowledge repository	Book	other
35	37	12	3	3

n=43

The data show that it is quicker to consult colleagues when seeking knowledge under the pressure of time, confirming the data in Q4. This also indicates that knowledge seekers facing time constraints or in urgent situations rely on trusted and human-centric sources. The high score

for the internet challenges the consultation of colleagues and the social dimension of knowledge seeking because it is a search portal that is always quick and easy to use. The low figures for books and knowledge repositories are expected as it can be time consuming to sift through them without the handy ‘search’ function.

Question 7 - Why? Please explain your choices in question 6.

This was an open-ended question. From the results, most respondents prefer to ask a colleague when under time constraints. This is understandable as someone who already has the knowledge to answer a question or solve a problem would be able to communicate the knowledge much faster than if one had to search for the knowledge oneself. This confirms Snowden’s statements that “you can always know more than you can say, and can always say more than you can write down”. The data was much the same across the three companies with each company having a higher percentage of knowledge seekers opting to ask colleagues.

The internet was not far behind as most people are very quick to jump onto Google when seeking knowledge to solve workplace problems. The knowledge searching era can be described as the ‘Google era’. The obvious limitations, however, are the sheer volume of information on the internet that can result in a greater time spent searching for what you need, as well as the abundance of useless information. Few knowledge seekers said they would search in a knowledge repository when in a hurry as this can be time-consuming especially if it is not well-maintained or if an employee is unskilled in search techniques.

Question 8 - In an ideal situation where would you prefer to look for knowledge to solve problems in the workplace?

Question 8 was a multiple choice question in which employees were asked to select one or more ways that they seek knowledge. The data represented below show the figures of the total number of selections for the various options for seeking knowledge.

internet	Colleague	data/knowledge repository	Book	Other
37	24	28	9	9

n=43

These figures support previous statements about the ‘Google era’, as 86% of employees preferred the internet as a knowledge search tool. Even though in Q7 most users rely on colleagues for knowledge when pressed for time, the slight drop in number may be that respondents do not want to appear to be ignorant or that they are too shy to ask. Asking a colleague is, however, part and parcel of everyday learning in the workplace and is a learning process that is “...an integral and inseparable aspect of social practice” (Lai and Graham 2009: 469). The high number of respondents that would prefer to access a knowledge repository shows how important it is to maintain them properly. They are beneficial to knowledge seeking as they are useful for knowledge contribution, knowledge retention, and knowledge re-use.

The small number of respondents preferring books as sources of information is not surprising given their cumbersome nature. Seminars and Conferences were identified as other sources of knowledge. The data corroborates the constructivist approach to learning as advocated by Lai and Graham who state that, “individuals construct knowledge through an interpretive interaction with the social world they experience” (2009: 469). This happens at multiple levels and uses multiple sources.

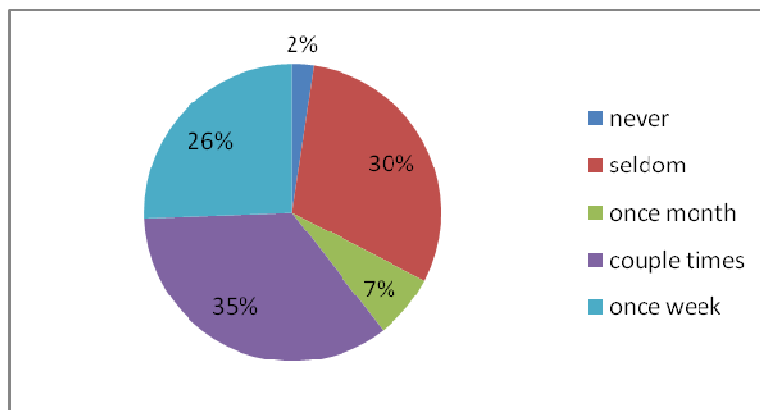
Question 9 - Why? Please explain your choices in question 8.

This was an open-ended question. Respondents indicated the main reason for the high level of confidence in the internet is that it is fast, convenient and contains a wealth of knowledge. There was also a high response rate for a knowledge repository by knowledge seekers because it would be better to have knowledge in a central repository and avoid reinventing the wheel. Also, it is specific to the field in which they are seeking knowledge and solutions to problems. The practical implications of this would be to put such a system in place if it does not already exist. Colleagues, once again, are a valuable source, but respondents indicated that it depends on whether one knows who to ask for the knowledge.

Question 10 - How often do you seek sources of knowledge within the organisation?

never	seldom	once per month	couple times per month	once per week	Total
1	13	3	15	11	43

This data can also be presented as percentages as follows:



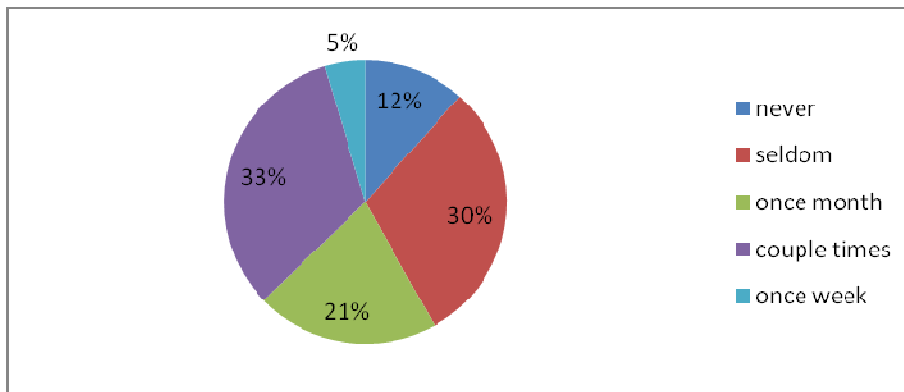
n=43

This is a good indication of the necessity of implementing opportunities for employees to seek, share and acquire knowledge, since 35% of respondents seek knowledge a ‘couple’ of times per month and 25% of respondents seek knowledge once per week within the company. Two percent never seek knowledge from within the company. Even though this figure seems negligible, it may indicate a lack of trust.

Question 11 - How often do you seek knowledge from outside the organisation?

Never	seldom	once per month	couple of times per month	once per week	Total
5	13	9	14	2	43

This data can also be presented as percentages as follows:



n=43

The data indicates that up to 33% of respondents look outside the company for knowledge. This could mean that there is a need to implement knowledge repositories, and provide opportunities for employees to share and seek knowledge internally. The reason why knowledge seekers tend to look outside for knowledge can be explained by the ‘pull’ force in knowledge construction described by Lai and Graham (See Figure 7). Knowledge seekers are determined to construct their own knowledge and solve workplace problems even if it requires ‘pulling’ knowledge from external sources. Simply ‘pushing’ knowledge onto knowledge seekers “does not necessarily lead to enhanced knowledge creation” (Lai and Graham 2009: 470).

4.4 Knowledge Sharing

Question 12 – How often do you share your knowledge with colleagues who seek it to solve problems?

never	sometimes	often	always	Total
0	2	15	26	43

Sixty percent of the respondents ‘always’ share knowledge with colleagues, while there are none that ‘never’ share, indicating that most have the mindset of sharing and distributing knowledge throughout their organisations. This interesting feature of organisational culture reflects forward

thinking. The biggest issue with previous mindsets have been the age-old saying that “knowledge is power”. This saying is mostly used in the context of “if I have the knowledge then I have the power and I am indispensable”. This is counter-productive to organisational learning and knowledge growth. The strength of the ‘pull’ of knowledge seekers increases the knowledge available for organisations.

Question 13 – Why do you share your knowledge with colleagues?

This was an open-ended question. There were numerous respondents that indicated that they shared knowledge for the benefit of the company and its goals. There were also some respondents who highlighted as a reason that they share their knowledge because it is a requirement of their job. A few respondents also indicated that they shared their knowledge with colleagues to avoid re-inventing the wheel. When we compare the number of those willing to share knowledge with the number of knowledge seekers, it is clear that knowledge seekers are usually also knowledge sharers, linking these two KM process closely.

Question 14 - When you share knowledge with colleagues, how do you do so?

Question 14 was a multiple choice question in which employees were asked to select one or more ways that they seek knowledge. The data represented below show the figures of the total number of selections for the various options for seeking knowledge.

e-mail	telephone	repository	face to face	other
37	27	8	39	6

n=43

E-mail and face-to-face are the preferred methods of knowledge sharing. This is mainly due to the ease in face-to-face sharing, as well as social interaction and trust between colleagues. If colleagues are in the same office or have easy enough access to one another, as in open-plan designs, it is usually easier to explain concepts and share ideas with each other person-to- person. There is often a loss of meaning and misinterpretation with emails, but they are quick and easy

forms of contact and sharing. A noteworthy point is that 65% of respondents in Q8 indicated that they preferred to look for knowledge in knowledge repositories. However, here only 19% indicate sharing knowledge with colleagues by means of knowledge repositories. This means either that repositories are not used in all the companies, or that the seekers are happy to seek knowledge in repositories but the process of documenting and sharing knowledge in these repositories is not yet instilled into employees.

Question 15 – In an ideal situation how would you prefer to share your knowledge with colleagues who are seeking knowledge?

This was an open-ended question. Most respondents identified face-to-face as the ideal method of transferring and sharing knowledge in the workplace. This feature of knowledge sharing corroborates the social and trust-based nature of knowledge seeking and knowledge sharing (See 2.8). Knowledge repositories, however, scored high in Company C suggesting that they are useful in industries where there are standardised knowledge solutions to problems. Emails also featured prominently for their ease of use and documentation and archiving properties. Experiential methods featured under the category of ‘other’. These respondents explained that they preferred sharing knowledge by showing colleagues how to solve problems, or letting them gain experience by doing a task themselves under some supervision. This range of ideal methods for sharing knowledge supports the constructivist learning approach as indicated by Lai and Graham, which involves information seeking, sense-making, and learning by doing, by experiences, or by problem solving.

4.5 Knowledge Repositories

Question 16 - Would you consider using a knowledge repository to find solutions to workplace problems?

yes	No	Total
40	3	43

Ninety three percent of the respondents indicated that they would use a knowledge repository to seek knowledge to find solutions to workplace problems. This does not negate the consultation of colleagues, but is an indication of its usefulness as another source of knowledge and as an alternative learning strategy in a company. It also corroborates the data for Q13 where 46% of respondents indicated that they share their knowledge because the company will benefit. The codification for retention of this knowledge is where repositories come into the picture. Repositories are especially useful for inducting new employees who often seek knowledge to complete tasks. Repositories also prevent the loss of many years of knowledge and experience. They are therefore useful for both knowledge seeking and knowledge sharing.

Question 17 – In your opinion, why are knowledge repositories useful or not useful as learning resources?

This was an open-ended question. The majority of the respondents affirm knowledge repositories as a central point for knowledge seekers and sharers and binds the two processes as sources for answers to problems and as places to deposit solutions to problems for future knowledge seekers. All the companies understand the need to retain, share and create knowledge and respondents shared similar reasons for using a knowledge repository. It acts as a central point of organisational learning. The few who mentioned that repositories were not useful indicated that they can be cumbersome and time consuming.

Question 18 - Should the knowledge repository be accessible to the entire company?

Yes	No	Total
47%	53%	100%

Though many respondents are willing to use and contribute to a knowledge repository, the majority feel that it should not be available to the entire organisation. This possibly connects with the views of Wei He *et al* (2008; See 2.8), about the role of trust in promoting organisational knowledge seeking and sharing. Knowledge seekers and sharers may not want to interact with those who are outside of their area of business or department. This can be as a result

of the nature of a particular area of operations, and it may be that the knowledge in question is only meant for a particular department. Even though there may be agreement about general knowledge sharing and creation among colleagues, this could still be hoarded in one area of operations as a 'sense of accomplishment' for that unit.

Question 19 – If yes, why should the knowledge repository be available to all?

This was an open-ended question. Respondents indicated that it is more beneficial for the entire organisation to have access to the knowledge repository. This indicates a positive learning mindset as knowledge seekers require social interaction with knowledge sharer's to create new knowledge and so do not want to be limited to the confines of a single department. Respondents also indicated that it would eliminate the cost of re-inventing the wheel.

Question 20 – If not, why should the knowledge repository not be available to all?

This was an open-ended question. Respondents indicated that it defeats the purpose of the business unit to share the knowledge with the entire organisation. This could be a result of knowledge seekers feeling that they would not be needed if everyone had their knowledge. This will impact on knowledge seekers outside that unit, and compromise the level of trust required for internal sharing. There was also an indication that access should be controlled in order for it to be of any use. This is closely related to the issue of the context of the knowledge, namely that it might be out of context and hence meaningless to persons outside the business unit.

4.6 Conclusion

This chapter presented, analysed and interpreted the data from the questionnaires returned by the companies. On the basis of this analysis and interpretation it now becomes possible to describe some of the features of knowledge seeking and sharing in the workplace. It is also possible to critique Lai and Graham's adapted cycle model and to develop it in some ways. In this way, it is possible to demonstrate how to integrate knowledge seeking into KM models, frameworks, and strategies. The following chapter will attempt to do so.

Chapter 5 Integrating Knowledge Seeking into KM model or framework, and a KMS

5.1 Introduction

This chapter proposes the integration of knowledge seeking into a KM model or framework, and a KMS. This is based on the data analysed and interpreted in Chapter 4. Knowledge seeking is important to KM models and frameworks in that it can facilitate the design of a ‘best-fit’ KM strategy. As pointed out in Chapter 2, there is still little understanding in the KM literature of knowledge seeking and how knowledge seeking behaviour can be incorporated into a KM model or framework, and a KMS. This chapter presents a solution by modifying Lai and Graham’s adapted KM cycle model, based on the data derived from questionnaires administered in a sample of companies. It also identifies some guidelines for designing a ‘best-fit’ KMS based on the modified KM model.

5.2 The value of knowledge seeking in KM models and frameworks

Most KM models and frameworks overlook the knowledge seeking process. And yet, knowledge seeking can enrich an understanding of KM and improve the chances of successfully implementing KM strategies in business organisations. Studies of knowledge seeking behaviour will improve decision-making in the workplace through a deeper understanding of how individuals solve problems and how they learn through experience. In existing models and KM frameworks the knowledge seeking process is either absent or assumed in other processes like knowledge creation, knowledge acquisition, and knowledge utilization. There is no explicit and sustained focus on knowledge seeking as an independent and significant KM process.

As new employees (individual knowledge seekers) join or move to other companies, their problem-solving and learning styles will improve competitiveness if there is a lively awareness

and appreciation of their value. Knowledge seeking occurs in companies regardless of whether there is a strategy, framework or design in place because people always seek knowledge to solve problems, and they usually share this knowledge with colleagues. But a deeper understanding of the process of knowledge seeking can, for example, add value to the design of a ‘best-fit’ KM strategy. Such a KMS will promote organisational goals better because it is based on an understanding of how employees seek and share knowledge in the workplace, and this understanding will improve organisational methods, tools, and procedures. In a recursive approach, in which ongoing investigations produce updated insights on how knowledge seekers solve problems and apply a range of learning styles, KM and KMS will become more effective.

Knowledge seeking is therefore an absent yet necessary element of KM. It is a theoretical gap in the KM literature, and a recent study of 160 KM models and frameworks only revealed hints and suggestions of knowledge seeking in the standard KM terminology. The model most concerned with knowledge seeking is that of Lai and Graham (See 2.10), but even they concede that more empirical investigations are necessary. They are themselves undertaking studies to develop their adapted KM cycle model. There is therefore still little empirical data to support their claim about which processes belong with information management and which belong with knowledge seeking (See Figure 8), and the claim that information management is a part of KM, as well as the claim that knowledge seeking instead of knowledge sharing is the essence of real KM, and other claims. Regarding their constructivist view of knowledge seeking and learning, they admit that “the activities or how people gain knowledge in this part [of the model] still needs further examination” (Lai and Graham, 2009: 471).

5.2.1 Features of knowledge seeking, and a critique of Lai and Graham’s model

Taking their model one step further, this study administered a questionnaire in a sample of companies to begin to describe some of the main features of knowledge seeking in relation to the knowledge sharing process, and to reveal some of the benefits and limitations of the Lai and Graham model (References are to Chapter 4):

- Knowledge seekers prefer human-centric contact and social interaction since the majority of the knowledge seekers asked a colleague when trying to solve problems. This feature emphasises the importance of the quality of trust in acquaintances instead of strangers, and it shows a preference for personal contact over KM system facilities (See Q4);
- Thirty three percent said that they seek knowledge outside the company, showing a stronger sense of loyalty to internal colleagues and a reluctance to seek knowledge outside of the company's 'walls'. This feature also foregrounds issues of trust and collegiality but, importantly, it identifies the strength of the demand/pull factor in knowledge seeking that will drive individuals to look more widely to solve problems, and their willingness to use other learning methods (See Q10 and Q11);
- Most knowledge seekers also share their knowledge face-to-face with colleagues. The two processes are therefore closely related, and hard to separate in practice. They interact and overlap so that in the course of seeking knowledge an individual will also share knowledge (See Q14). This can be said to be a mutual learning situation in which both parties benefit as they seek and share knowledge. In other words, both the demand/pull factor in knowledge seeking and the supply/push factor in knowledge sharing are deeply social in nature. This feature reveals a benefit and a shortcoming in the Lai and Graham model;
- The benefit is that Lai and Graham emphasise knowledge seeking as different kind of process in a KM model and framework than knowledge creation, knowledge acquisition, *et cetera*. They assign a broader or more comprehensive scope for knowledge seeking in their model (See Figure 8). Knowledge seeking, if it is a process or step or phase, seems to be more generic in character, and it can interact with all the other KM processes in special ways. However, too little is known about knowledge seeking in KM at this point to say much more than this;
- The shortcoming of the Lai and Graham model is that it separates knowledge seeking from knowledge sharing. As the questionnaire data show, they cannot be so easily separated in practice (See Q14). Also, problem solving and learning is more social than situated learning theory, but they emphasise the individual as a learner and a knowledge seeker in their preferred experiential learning model;

- The majority of the respondents indicated that they would ideally use a knowledge repository to seek knowledge to find solutions to workplace problems. This indicates its usefulness as another source of knowledge and as an alternative learning strategy in a company. Repositories are especially helpful for inducting new employees who seek knowledge to complete tasks. Repositories also prevent the loss of many years of knowledge and experience, and they are useful for both knowledge seeking and knowledge sharing;
- Lai and Graham adopt the cognitive approach to knowledge construction, and they review several approaches to learning in the workplace that favour the individual knowledge seeker. A limitation of their approach is that there are several learning theories and learning styles, and there is more than one approach to knowledge construction, such as cognitive constructivism, social constructivism, and so forth. Even though the argument for their choice is convincing, other approaches may be equally applicable despite their own shortcomings. In other words, there should be room for more theoretical approaches in the study of knowledge seeking in KM; and
- Another limitation is the model's focus on the individual as a 'knower' or knowledge seeker. It is implicit in KM that entities like organisations and companies can also 'know' in the sense that individuals do. Companies can also therefore seek knowledge and solve problems and learn. The most suitable approaches for collective or group learning, problem-solving, and 'knowing' should, however, be investigated in future studies. The Lai and Graham model is therefore too individualistic.

On the basis of these remarks about the features of knowledge seeking and the benefits and limitations of the Lai and Graham model, a modified knowledge seeking-based KM model can be proposed.

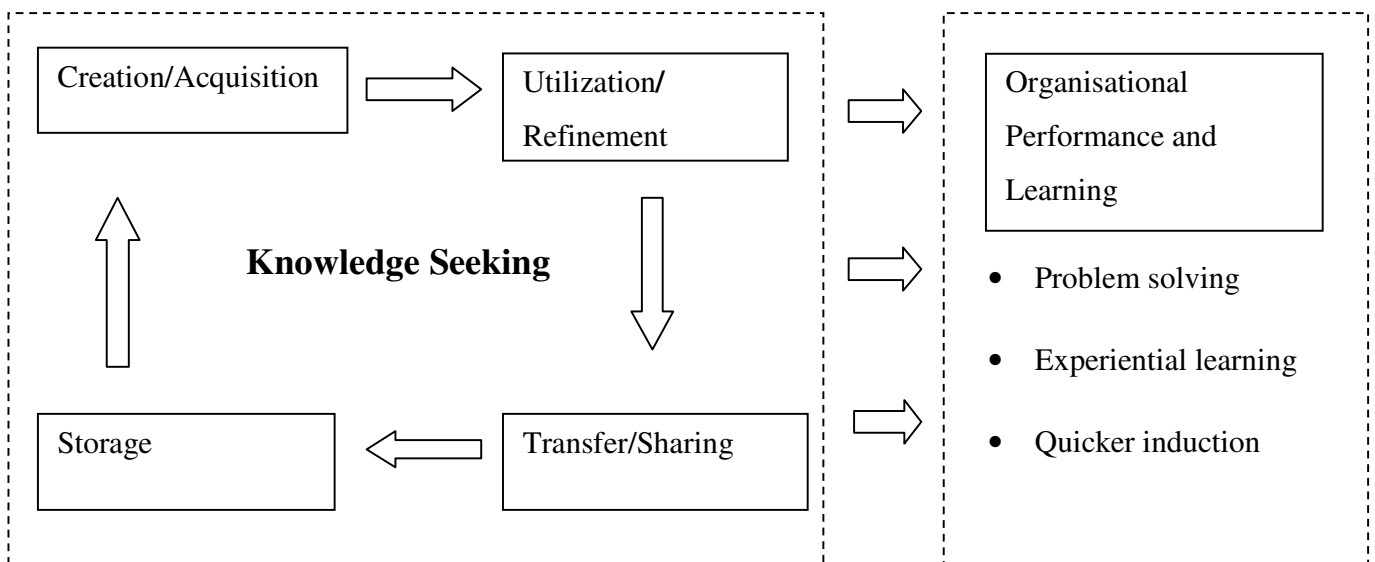
5.3 A knowledge seeking-based KM model

The most significant difference between the proposed model and the Lai and Graham model (See Figure 8) is that no hard distinction is made between KM and Information Management. Such a

distinction seems less valuable at this point than the need to integrate knowledge seeking into KM models and frameworks. At the same time, such a hard separation prevents the possibilities of understanding how knowledge seeking interacts with other KM processes. Lai and Graham, for example, indicate that utilization belongs with knowledge seeking in their adapted model but who can say that other processes like storage and refinement are not implicated also? It is this open-minded quality that distinguishes the proposed model from theirs. Further empirical tests will elaborate the model but what is clear is that knowledge seeking can no longer be assumed, or implicit, or overlooked in KM models and frameworks. It deserves full theoretical status.

Further research will reveal how knowledge seeking (learning methods, learning styles, and ways of knowing and problem solving) in the workplace impacts KM processes, and how the findings can be used to improve organisational performance. This model takes a modest step in this direction by explaining the components in respect of the data obtained from the sample of companies. The model can be presented graphically, as follows:

Figure 9: A Knowledge Seeking-based KM model



- **Knowledge seeking:** This is at the core of the model, and although it is generic in character and unlike knowledge creation, knowledge acquisition, *et cetera*, knowledge seeking is a theoretical element that can no longer be overlooked or assumed in KM models and frameworks. Knowledge seeking can be understood through concepts of knowledge construction, learning theories, learning styles, and problem solving. Knowledge seeking is a generic and special kind of process that interacts with other KM processes in ways that still have to be investigated;
- **Creation/Acquisition:** Most knowledge seekers acquire knowledge from colleagues in order to solve problems. This shows that knowledge seeking is closely interrelated with knowledge creation and knowledge acquisition, and that learning from colleagues involve human-centric and trust relationships as important qualities in workplace problem solving. The practical implication of the connections is that it would be useful to put in place a work environment that promotes social contact with colleagues, and that is conducive to building trust relationships;
- **Utilization/Refinement:** The demand/pull factor to solve problems will drive knowledge seekers to look for and utilize sources outside the company. Learning continues through the utilization and refinement processes when knowledge seekers select and utilize information sources outside the company and refine it as useful knowledge to make sense of and solve a problem. In doing so, knowledge seekers undergo experiential learning and they can share these experiences with colleagues;
- **Transfer/Sharing:** Most knowledge seekers share their knowledge socially with colleagues. The two processes are closely integrated, and hard to separate in practice. When individuals seek knowledge they will also share knowledge. The practical implication is that one can successfully build a repository using the knowledge acquired by knowledge seekers;
- **Storage:** Knowledge needs to be stored for re-use because organisations cannot afford to lose knowledge that has already been created and acquired. Storage needs to be looked at from the point of view of the knowledge seeker. In other words, employees should be skilled in search techniques, but they should also adopt a positive attitude to seeking knowledge that is stored in repositories;

- **Organisational performance and learning:** The integration of knowledge seeking as a KM process in a KM model or framework will improve organisational performance and organisational learning in a number of ways:
 - problems will be resolved faster and more effectively as a result of special provisions in the workplace to construct an environment that accommodates individual learning styles, for example oral, printed, visual *et cetera*;
 - the recognition of experiential and other learning methods as ways of solving problems will benefit personal and company growth; and
 - practical arrangements to accommodate the interrelatedness of knowledge seeking and knowledge sharing will ensure quicker induction of new personnel and a smooth transition into the company. This will reduce the time lag for new personnel to become productive.

5.4 Implications of knowledge seeking for designing a ‘best-fit’ KMS

What all the implications of a knowledge seeking-based KM model or framework are for designing a ‘best-fit’ KMS will have to be worked out more fully as we learn more about knowledge seeking. It is possible, however, to give some indication of how to apply such a KM model or framework by adapting an established KMS model using the data from the sample of companies examined in this study. The Hansen *et al* model (See Figure 3) is useful for this exercise.

These authors argue that some companies automate knowledge management while others rely on their people to share knowledge through more traditional means. Emphasizing the wrong approach or trying to pursue both at the same time, they believe, will quickly undermine a business (See 2.4.1). A codification strategy, associated with the automated approach, revolves around IT in which knowledge is carefully codified and stored in databases where it can be accessed and easily re-used by anyone in the company. The accompanying KMS is described as ‘*people-to-documents*’ and implies developing an electronic document system that contains

knowledge extracted from the person who developed it, made independent of that person, and then re-used for various purposes.

The alternative strategy in Hansen *et al* advocates a personalization KMS, which revolves around knowledge closely tied to the person who developed it and that is shared mainly through direct ‘*person-to-person*’ contacts. The emphases in this case are dialogue and knowledge sharing between individuals instead of using knowledge objects in an electronic document system or a database. Organisations are encouraged to develop networks to link people so that they can share knowledge in several ways.

The limitation of the Hansen *et al* model as it stands is that it encourages dualistic thinking, or thinking in terms of right/wrong and either/or. It excludes the possibility of companies using both approaches at the same time to find a ‘best-fit’ solution. The features of knowledge seeking described in this study, on the other hand, connect it with knowledge sharing, suggesting that both approaches are possible in the same organisation and that it is also desirable for improving organisational performance. The model of Hansen *et al* can therefore be adapted in the following ways:

- The ‘*people-to-documents*’ and ‘*person-to-person*’ approaches should be integrated into a single KMS that can be described as ‘*knowledge seeking and sharing through documents and through people*’. With knowledge seeking at the core of this strategy, problem solving and learning methods will not be as restrictive or mutually exclusive as in Hansen *et al*. Companies will take into account what IT and human resources they have, and adapt or tailor their KMS accordingly instead of opting for a particular or pre-determined approach. The sample of companies in this study has shown that seeking and sharing with colleagues is preferable but that knowledge seeking behaviour does not necessarily exclude databases, repositories, or external sources. Company B, for example, had a high number of knowledge seekers that preferred access to knowledge via a repository. This feature requires Company B to emphasise one approach, and to factor this into the design of its KMS and to select the repository tools best suited to Company B. An adaptive or flexible approach to designing a ‘best-fit’ KMS requires constant awareness of the

company's state of IT and human resources to allow renewal of the KMS to 'best-fit' a given company at a given time;

- Investment in IT should be linked to the knowledge seeking and problem solving methods preferred in a company instead of Hansen *et al*'s simple choices between connecting people with re-usable knowledge or facilitating exchanges and conversations between people. Policy decisions about IT investment should be linked to empirical investigations into the ways in which people actually seek knowledge to solve workplace problems. If people prefer to use colleagues for knowledge seeking and sharing then IT investment and policy decisions should prioritise tools and methods that exploit this. In other words, questions should be asked about the kinds of IT that encourage or improve brainstorming and face-to-face communication, etc. But questions should also be asked about the kinds of IT that teaches people how to solve problems, and that sensitises them and the company to different learning styles;
- Hansen *et al* focus on the hiring strategies, training, and rewarding of human resources, but they ignore induction. A company designing a 'best-fit' KMS should recognize that new people bring their own knowledge seeking behaviours and learning styles with them, and that these could be a help or a hindrance. Induction of new personnel should not just be about conveying the company's way of solving problems or knowledge seeking behaviour to them. Induction should also ascertain their learning styles and knowledge seeking patterns and preferences. Although the data for this study was consolidated across the sample of companies to describe general features of knowledge seeking, there are definite differences among them that are important factors in the organisational learning styles and performance of each company.

Other changes to Hansen *et al* and other KMS models are possible, but the point to be made is that the integration of knowledge seeking into the design of a KMS brings it nearer to being a 'best-fit'.

5.5 Conclusion

In this chapter, the interpreted data from Chapter 4 was used to identify some features of knowledge seeking and to modify Lai and Graham's adapted cycle model. The implications of the features of knowledge seeking were used to design a 'best fit' KMS, using the Hansen *et al* model as one example. The final chapter will summarise the main findings of the study, and identify recommendations and suggestions for future research.

Chapter 6 Findings and Recommendations

6.1 Introduction

This study assessed the theoretical status of knowledge seeking in a selection of established KM models, frameworks and strategies, and reviewed the work of KM researchers who have grappled with the idea of knowledge seeking. The study also described some of the key features of knowledge seeking in a small business intelligence consulting company, a branch office of a country-wide IT company, and a department within a larger insurance company. The data from a company that deals with financial software could not be used. Using questionnaires and descriptive statistical methods to generate, analyse and interpret the data, the study identified some of the key features of knowledge seeking in the workplace by asking where employees seek knowledge to solve problems, where they seek knowledge under the pressure of time, and where they would prefer to seek knowledge in ideal circumstances.

On the basis of the interpreted data, Lai and Graham's adapted KM cycle model was modified, and some guidelines for designing a 'best-fit' KMS based on the modified KM model were described. This chapter presents the findings, recommendations, and suggestions for future research, and an overall conclusion.

6.2 Answering the research questions

The main research question will be answered by combining the answers for the three research sub-questions. These answers derive from the data and information gathered from the KM literature review in Chapter 2, the questionnaires presented, analysed and interpreted in Chapters 3 and 4, and the evaluations of Chapter 5. The main research question posed in Chapter 1 is:

How can the process of knowledge seeking be integrated into a KM model or framework, and the design of a KMS for a company?

With a view to answering the main research question, the following answers for the sub- research questions are discussed below.

6.2.1 Research sub-question 1: To what extent does knowledge seeking feature in KM models, frameworks, and strategies?

Knowledge seeking has not been adequately addressed in the KM literature, and references to knowledge seeking are either implicit or they are unsatisfactory. The study found the following in some of the standard KM models, frameworks, and strategies:

- The emphasis falls too heavily on knowledge creation, and the conversion from tacit to explicit knowledge in Nonaka and Takeuchi's SECI model (See 2.3.1);
- There is no sustained focus on knowledge seeking behaviour in Snowden's Cynefin model (See 2.3.2);
- Knowledge seeking is implied, but it is unclear how, why, and where knowledge is sought, in Prusak's Origins model (See 2.3.3);
- Knowledge seeking is merely suggestive in Hansen's personalisation and codification KM strategies (See 2.4.1); and
- There are veiled references to knowledge seeking in the terms found in the 160 KM models and frameworks reviewed by Heisig, but no explicit acknowledgement of knowledge seeking as an independent KM process (See 2.8.1.1).

Lai and Graham's adapted KM model is based on the standard frameworks and life-cycle models in KM literature, and focuses particularly on knowledge seeking. Their model does, however, have shortcomings and contradictions. Knowledge seeking is separated from information management as a block that contains other KM processes (See Figure 7). This separation contradicts their claim that knowledge seeking as learning can and does involve information seeking and an individual's use of material sources. Also, knowledge seeking has a generic status that encompasses the KM processes of creation, acquisition, and utilisation.

Separating knowledge seeking from knowledge sharing suggests that sharing is only about externalized or explicit knowledge. This raises the question whether the two processes can be so sharply separated from each other and whether both processes cannot or do not occur together in practice. This study has made a modest demonstration of the close connection between knowledge seeking and knowledge sharing. Although there is still much work to be done to close the gap in the KM literature on knowledge seeking, it is an emerging theoretical concern in the KM research community.

6.2.2 Research sub-question 2: What can be learned from the cognate discipline of LIS about knowledge seeking that is relevant for KM models, frameworks, and strategies?

There has been a sustained focus on information seeking in the LIS literature, in the context of information behaviour. Stillwell (2010), for example, indicates a prodigious growth in the number of articles and papers on information behaviour from 2000 onwards. This shows that there has been much thought and research on the information behaviour of users and their information seeking behaviour in the LIS literature over the past decade. Although the standard reference in LIS is to information seeking, the relations between information and knowledge are well-documented. There are a number of theories and models of information seeking in LIS, but Wilson (2000) deals with this topic most comprehensively.

Wilson's (1981) model locates the concepts of information need, information seeking, information exchange, and information use in a flow diagram that can be seen as charting the behaviour of an individual faced with the need to find information. This model has been developed and updated in a number of subsequent articles, but it remains essentially the same (See Figure 5). The study found that the following aspects of LIS are relevant for knowledge seeking in KM models, frameworks, and strategies:

- As in KM, information is closely related with explicit knowledge in LIS, and the two concepts are often equated. Experts claim that knowledge is only tacit and that as soon as

knowledge moves into the realm of the explicit it becomes information. It is this close relation between the two concepts that make LIS literature a valuable source of ideas for knowledge seeking in KM;

- Information seeking behaviour is located at the heart and centre of Wilson's information behaviour model as an independent component that connects with all other components of his model (See Figure 5). Although knowledge seeking is still poorly theorised in KM, there is already an indication of its generic character in Lai and Graham's model as a binding context for some of the KM processes. LIS research on information seeking and information behaviour will therefore continue to be useful for KM as it develops the knowledge seeking concept further; and
- The information seeking behaviour of academics across the social sciences, physical sciences, and among engineers and research scientists has been investigated and modelled in LIS. And recent studies have examined some of these groups to see if the findings were also applicable in an electronic information-seeking environment (See 2.7.1). This wide area of application of information seeking in LIS research is eminently suited to the range of KM applications of knowledge seeking in several types of industries and organisations.

It is apparent that although LIS research cannot be carried over to the KM environment in a straightforward and simplistic way, the lessons learned in this cognate discipline over a long period of sustained empirical investigation will be helpful to KM researchers investigating knowledge seeking.

6.2.3 Research sub-question 3: What are the main features of knowledge seeking and knowledge sharing in a sample of companies?

The study found the following main features of knowledge seeking in relation to the knowledge sharing process:

- Knowledge seekers prefer human-centric contact and social interaction, which emphasises the importance of trust and a preference for personal contact over KM system facilities;
- In some cases, however, knowledge seekers will look for solutions to problems outside of the organisation, underscoring the strength of the demand/pull factor in knowledge seeking and their willingness to use other learning methods;
- Most knowledge seekers also share their knowledge face-to-face with colleagues, indicating that the two processes are closely related, and hard to separate in practice. The demand/pull factor in knowledge seeking and the supply/push factor in knowledge sharing are deeply social in nature;
- Knowledge seeking, if it is a process or step or phase, seems to be more generic in character, and it interacts with the other KM processes in special ways. Too little is known about knowledge seeking in KM at this point, however, to say much more than this;
- Knowledge seekers are not reluctant to use knowledge repositories to seek knowledge to find solutions to workplace problems. This indicates their usefulness as another source of knowledge and as an alternative learning strategy in a company; and
- Knowledge seeking should be viewed and understood as individual and group learning processes. Although Lai and Graham favour the cognitive approach to knowledge construction, there are several learning theories and learning styles and hence more than one way of approaching knowledge seeking in KM.

Admittedly, the sample is too small to make definitive statements about knowledge seeking and to make wide inferences, but these findings provide a beginning from which large studies can benefit.

6.2.4 Main Research Question: How can the process of knowledge seeking be integrated into a KM model or framework, and the design of a KMS for a company?

The study found that knowledge seeking can be integrated into KM models or frameworks in the following ways:

- Most KM models and frameworks are based on those that have preceded them, showing a cumulative development and consolidation of earlier models, concepts and processes. This has been convincingly demonstrated in the life-cycle model of King, Chung, and Haney (See 2.8.1.2). An implication of this is to use Lai and Graham's adapted life-cycle model, which is itself based on King, Chung, and Haney, as an example to integrate knowledge seeking in a KM model or framework. It represents the latest (2009) attempt to integrate knowledge seeking in a KM model. This study has engaged with Lai and Graham's model, and recommends a similar engagement by others as the most meaningful way of developing further an understanding of knowledge seeking;
- For those who do not, however, wish to use the Lai and Graham adapted life-cycle model, knowledge seeking should be integrated into KM models and frameworks as a different kind of process, namely as a generic process and perhaps even as a context that binds or connects with other processes, such as knowledge creation, knowledge acquisition, *et cetera*; and
- Knowledge seeking should be understood as a kind of learning process related to problem solving in the workplace. Lai and Graham view knowledge seeking as an experiential learning process involving the improvement of a seeker's knowledge structure to solve problems or satisfy some goal. This conception flows from their constructivist approach to learning, and results in the separation of knowledge management from information management. There are, however, other approaches to knowledge development and other learning theories that may arrive at different conclusions. Knowledge seeking can therefore be integrated into models and frameworks in other ways, but they should be connected with approaches to knowledge development and learning theories and learning styles.

The study found that knowledge seeking can be integrated into the design of a ‘best-fit’ KM strategy for a company by adapting the Hansen *et al*’s codification *versus* personalisation model (See 2.4.1 and Figure 3) in the following ways:

- Recognise that the limitation of the Hansen *et al* model as it stands is that it encourages dualistic thinking, or thinking in terms of *versus*, of right or wrong, and either/or. It excludes the possibility of companies simultaneously using both approaches to find a ‘best-fit’ solution. The features of knowledge seeking described in this study, however, connect it with knowledge sharing, suggesting that both approaches are possible in the same company and that it is also desirable for improving organisational performance;
- Integrate Hansen *et al*’s ‘*people-to-documents*’ and ‘*person-to-person*’ approaches into a single KMS that can be described as ‘*knowledge seeking and sharing through documents and through people*’. With knowledge seeking at the core of this strategy, problem solving and learning methods will not be as restrictive or mutually exclusive as in Hansen *et al*. Companies will take into account what IT and human resources they have, and adapt or tailor their KMS accordingly instead of opting for a particular or pre-determined approach. An adaptive or flexible approach to designing a ‘best-fit’ KMS will require constant awareness of the company’s current state of IT and human resources to allow renewal of the KMS to ‘best-fit’ a given company at a given time;
- Link investment in IT to the knowledge seeking and problem solving methods preferred in a company instead of Hansen *et al*’s simple choices between connecting people with re-usable knowledge or facilitating exchanges and conversations between people. Policy decisions about IT investment should be linked to empirical investigations of the ways in which people actually seek knowledge to solve workplace problems. If people prefer to use colleagues for knowledge seeking and sharing then IT investment and policy decisions should prioritise tools and methods that exploit this. In other words, questions should be asked about the kinds of IT that encourage or improve brainstorming and face-to-face communication, etc. But questions should also be asked about the kinds of IT that teaches people how to solve problems, and that sensitises them and the company to different learning styles; and
- Do not ignore induction as Hansen *et al* do. A company designing a ‘best-fit’ KMS should recognize that new people bring their own knowledge seeking behaviours and

learning styles with them, and that these could be a help or a hindrance. Induction of new personnel should not just be about conveying the company's way of solving problems or knowledge seeking behaviour to them. Induction should also ascertain their learning styles and knowledge seeking patterns and preferences.

Other changes can be added to Hansen *et al* and other KM strategies, but the study shows that knowledge seeking can bring the design of a KMS nearer to being a 'best-fit'.

6.3 Recommendations

The main research question is framed in such a way that it calls for recommendations regarding the integration of knowledge seeking into KM models and frameworks, as well as a KM strategy for a company. It is therefore pointless to repeat them here since they are both the findings of the study's main question as well as recommendations. There are, however, a few other recommendations that can be added here:

- The companies included in this study should test the adoption of the knowledge seeking-based KM model, and implement the adapted Hansen *et al* KM strategy to examine their effectiveness in practice;
- These models and strategies in the selected companies should be evaluated after a period of three years to see how they can be improved. Such evaluations will ensure that KM strategies remain relevant and result in desired outcomes; and
- KM researchers should conduct similar studies using larger samples with a greater variety of companies and/or organisations to deepen an understanding of knowledge seeking;

Further recommendations are included as suggestions for further research below.

6.4 Suggestions for future research

The following are recommendations for further research:

- Explore the interactions of knowledge seeking with other KM processes;
- Investigate themes related to knowledge seeking such as learning theories, learning styles, and so forth.
- Examine the ways in which knowledge seekers look for knowledge across borders. In other words, internationalise knowledge seeking by using international company networks;
- Conduct in-depth interviews with employees to discover their learning styles (for example, oral, printed or visual, *et cetera*) in order to test Lai and Graham's model more thoroughly.

As a topic that is still under-researched in the KM literature there are certainly many more suggestions that can be added. The most productive route would however be to take Lai and Graham's ideas and the findings of this study as points of departure.

6.5 Conclusion

This study investigated the integration of knowledge seeking into KM models, frameworks, and KM strategies. The approach was to explore and examine the theoretical status of knowledge seeking in the KM literature, and to describe some of the main features of knowledge seeking in a sample of companies. The findings cannot be extrapolated to all companies but they certainly demonstrate that this new and emerging concern can no longer be ignored by the KM research community.

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Appendix A

Questionnaire

Section A – General Information

Section B – Information/Knowledge Acquisition

Section C – Information/Knowledge Sharing

Section D – Knowledge sharing tools

Section A – General Information

1. Gender

Male	Female

2. Age

21-30	31-40	41-50	51-60	60 - up

3. Number of years at company

Less than 1yr	1-3yrs	3-6yrs	6-10yrs	10yrs and up

Section B – Information/Knowledge Acquisition

Definition of Data/Knowledge Repository:

A database of information about applications software that includes author, data elements, inputs, processes, outputs and interrelationships. A repository is often used in order to identify objects and business solution for reuse.

(Webster’s online dictionary www.websters.com)

4. Where do you seek knowledge to solve problems at work? Tick all relevant boxes.

Internet	Colleague	Data/Knowledge Repository	Books	other
1	2	3	4	5

5. How frequently do you find the knowledge you are looking for?

Never	Sometimes	Often	Always
1	2	3	4

6. If you have limited time to find knowledge to solve problems in the workplace, where do you get it from? Tick all relevant boxes.

Internet	Colleague	Data/Knowledge Repository	Books	other
1	2	3	4	5

7. Why? Please explain your choice regarding question 6.

8. In an ideal situation where would you prefer to look for knowledge to solve problems in the workplace? Tick all relevant choices

Internet	Colleague	Data/Knowledge Repository	Books	other
1	2	3	4	5

9. Why? Please explain your choice regarding 8.

10. How often do you have to seek sources of knowledge within the organisation?

Never	Very Seldom	Once a Month	Couple of Times a Month	Once a week
1	2	3	4	5

11. How often do you have to seek sources of knowledge from outside the organisation?

Never	Very Seldom	Once a month	Couple of times a month	Once a week
1	2	3	4	5

Section C – Knowledge Sharing

12. How often do you share your knowledge with colleagues who seek to solve problems?

Never	Sometimes	Often	Always
1	2	3	4

13. Why do you share your knowledge with colleagues?

14. When you share knowledge with colleagues, how do you do so? Tick all relevant boxes.

Email	Telephone	Repository	Face to Face contact	Other
1	2	3	4	5

15. In an ideal situation, how would you prefer to share your knowledge with colleagues who are seeking knowledge?

Section D – Knowledge sharing tools

16. Would you consider using a knowledge repository in order to find solutions to workplace problems?

Yes	No
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17. In your opinion, why are knowledge repositories useful or not useful as learning resources?

18. Should the knowledge repository be available to the entire company?

Yes	No

19. If yes, why should the knowledge repository be available to all?

20. If no, why should the knowledge repository not be available to all?

Thank you for your participation