CHAPTER 2

KNOWLEDGE MANAGEMENT

2.1 INTRODUCTION

Since the beginning of time, man has been an inquisitive creature, and "to know" has been an essential ingredient of man's make-up.

Organisations are in essence human structures. Therefore, they cannot function without knowledge. Since the 20th Century, though, the accumulation of knowledge has accelerated phenomenally. Knowledge became the most important asset of organisations in today's competitive environment, and managing it has become essential for their survival and prosperity.

The researcher deemed it important to first understand the process of knowledge management, by looking at what knowledge is, how it is created, and how it is transferred. To reach this aim, the researcher in this chapter firstly investigates the different perspectives on knowledge, namely viewing knowledge as object, a representationalistic view on knowledge, knowledge embedded in individuals, and knowledge embedded in communities. This is followed by definitions of the concept knowledge, and a discussion of knowledge work, types of knowledge and the processes of knowledge creation, knowledge transfer and knowledge capture. Following this, the concept of knowledge management is defined, after which an attempt is made to determine if knowledge management could be described as a discipline. This is followed by an investigation into the purpose and value of knowledge management. Various knowledge management models have been suggested over the years, and those of value to the study are included in this chapter. Thereafter, different perspectives on knowledge management are investigated, followed by an investigation of the drivers that led to the development of knowledge management.

At the end of the chapter, an overview is provided of the different stages through which knowledge management developed, in an effort to better understand the interdisciplinary character of knowledge management as a concept.

The concept of knowledge will now be addressed.

2.2 KNOWLEDGE

A definition of the concept 'knowledge' is quite difficult to formulate, because the concept can be viewed from a variety of perspectives. To gain a better understanding of the concept, some of the perspectives pertinent to this study are discussed, followed by a description of some of the definitions on 'knowledge' as found in literature, and an identification and discussion of the different types of knowledge and knowledge processes pertinent to this study.

2.2.1 PERSPECTIVES ON KNOWLEDGE

Perspectives pertinent to this study include knowledge as object that exists independently of human action, a representationalistic view on knowledge, knowledge embedded in individuals, and knowledge embedded in communities (Aadne, Von Krogh and Roos 1996: 11; Wasko and Faraj 2000: 156).

2.2.1.1 Knowledge as an object

This perspective assumes a Positivist Neo-Kantian view of knowledge, defined as *"justified true belief"* (Nonaka 1994: 15; Spender 1996: 47). According to this perspective, *"knowledge can exist independently of human action"*, and perception *"is foremost a private good and can be described along a variety of dimensions such as tacit-explicit, universal-local, declarative-procedural, or sticky-fluid"* (Wasko and Faraj 2000: 156). Knowledge is considered a private good that can be appropriated by organisations or exchanged like any other commodity (Davenport and Prusak 1998: 149). This perspective corresponds to Radical Structuralism, one of the four paradigms in Burrel and Morgan (1979: 326), which also view knowledge as an object that can exist independently of human action and perception, and can be used as a structural asset in an organisation.

On the other hand, Aadne, Von Krogh and Roos (1996: 11) suggest a representationalist view on knowledge, which link up with the view of knowledge as an object.

2.2.1.2 A representationalistic view on knowledge

According to this view, reality, be it objects, events or states, reside outside the cognising subject and is objectively given for everyone (Aadne, Von Krogh and Roos 1996: 11). The mind furthermore has the ability to create inner representations, which more or less correspond to this given reality. Knowledge is therefore regarded as a mirror of reality (Aadne, Von Krogh and Roos 1996: 11). Human beings on the other hand is regarded as being transparent to information from the outside, which is then processed and subsequently used to build mental representations that can be stored in the mind (Aadne, Von Krogh and Roos 1996: 11). This corresponds to Senge's (1990a: 8) discipline of mental models, which he describes as deeply ingrained assumptions, generalisations, or even images/pictures that influence the way we see the world and the way we act.[1]

Logic is regarded as a human competence that assists people in the attainment of knowledge (Aadne, Von Krogh and Roos 1996: 11). Furthermore, because represented objects, events, or states have the potential to be complex, and because of time constraints on the observations, the mind is assumed to have some kind of competence probability judgements and heuristics. Learning therefore means to improve representations through assimilating new experience and to further develop competence in logic and probability judgments (Aadne, Von Krogh and Roos 1996: 12).

Some types of knowledge are rather explicit, articulated and packaged, and are therefore relatively easy to transfer between organisations or sections in an organisation. On the other hand, some knowledge can be highly organisation specific and less diffusible across the boundaries of the organisation or section (Aadne, Von Krogh and Roos 1996: 12). This type of knowledge is regarded by Polanyi (1962: 203-222) as tacit and personal, and can be found in individual and social relationships in the organisation. According to Aadne, Von Krogh and Roos (1996: 12), the only possible

1. For a more detailed discussion on mental models see Section 3.3.3.3 of this study.

way to reveal and transfer this knowledge is to establish a closer relationship with the one possessing it. This is where Communities of Practice as a social entity can play an active role.[2]

2.2.1.3 Knowledge embedded in individuals

According to this perspective, knowledge is inseparable from people, resides only in individual minds, and can be defined as "that which is known" (Grant 1996: 110). This corresponds to Burrel and Morgan's (1979: 280) radical humanism paradigm, where knowledge is regarded as the social practice of knowing. In this perspective, *"knowledge is considered a private good that is owned by the individual, and its development and exchange occurs through one-to-one interactions"* (Wasko and Faraj 2000: 156). Because it seems that people know a great deal more than they can articulate, it is hard to formalize and communicate this tacit aspect of knowledge (Wasko and Faraj 2000: 159). According to Polanyi (1962) and Wasko and Faraj (2000: 159), knowledge is also deeply rooted in action, commitment and involvement in a specific context. Simon (1991: 125-126) regards organisational knowledge in a corporate context as in the minds of an organisation's individual employees, which is increased through the learning of individual employees, or by adding new people to the organisation. Knowledge is thus *"not owned by the organisation but rather resides in the minds of individuals"* (Wasko and Faraj 2000: 159). In other words, knowledge is treated as a boundary asset *"where the asset is put to use for the organisation, but the asset itself resides within an external constituency"* (Nanda 1996: 105; Wasko and Faraj 2000: 159). This means that individuals have control over their personal knowledge and can do what they wish with it (Wasko and Faraj 2000: 159). These individuals are normally willing to exchange their knowledge for intangible returns such as status, respect, reputation, image, self-esteem, perceived usefulness, compliance and obligation (Blau 1964: 89; Constant, Kiesler and Sproull 1994: 403, 405-406; Jarvenpaa and Staples 2000: 131-135). However, one disadvantage of this perspective is that knowledge is not converted into a structural asset of the organisation (Wasko and Faraj 2000: 160). Knowledge stays under the control of the individual, is not easily transferable, and can be lost if the person leaves the organisation (Wasko and Faraj 2000: 160). Knowledge sharing according to this perspective is therefore motivated by self-interest.

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2. See Chapter 4 for a description of Communities of Practice.

The willingness of individuals to exchange their knowledge for intangible returns such as status, respect, reputation, image, self-esteem and perceived usefulness can be exploited to its fullest in a Community of Practice. By giving the individual an opportunity to share his/her knowledge with his/her peers, it earns him/her respect, reputation and status in the organisation. Communities of Practice also provide an individual with an opportunity to add to his knowledge.

Knowledge is not merely an individual asset, but an integral part of a community, as will be addressed in the next perspective.

2.2.1.4 Knowledge embedded in Communities

According to this perspective, knowledge is *"an intangible resource that can be shared and spread throughout a Community of Practice without losing value, nor being consumed in the process of transfer"* (Wasko and Faraj 2000: 156). Knowledge is defined as the *"social practice of knowing"*, and learning, knowing and innovating are emphasized as closely related forms of human activity that is implacably connected to practice (Brown and Duguid 1991: 40-41; Schultze 1999: 160, 163; Wasko and Faraj 2000: 60). This perspective links up with the interpretive paradigm as promoted by Burrel and Morgan (1979: 260), where knowing is viewed as a kind of knowledge that is inseparable from action (Schultze 1999: 163). Knowledge is viewed by Brown and Duguid (1991), Lave (1988) and Lave and Wenger (1991) as a public good that is socially generated, maintained, and exchanged within emergent Communities of Practice. Brown and Duguid (1991: 53-55) and Boland and Tenkasi (1995: 350-351) view organisations as a collection of overlapping Communities of Practice, where each community develops its own colloquial, shared stories and codes, and where knowledge is best comprehended within the context of its community. This perspective therefore considers knowledge as a collective asset that is maintained by the community, collectively contributed to by members of the community, and accessible to all members (Wasko and Faraj 2000: 160). Knowledge sharing is not motivated by self-interest, but takes place in the form of open discussion and debate about issues relevant to the community and by sharing stories of personal experience (Wasko and Faraj 2000: 161). The researcher differs from Wasko and Faraj (2000: 161) and is of the opinion that knowledge sharing by individuals in Communities can be motivated by self-interest. People will take part in a Community of Practice for the benefit they can gain from it.

Although knowledge can be viewed as an object (explicit) and representative of reality, and can be embedded in individuals, the perspective of *"knowledge embedded in communities"* as encompassing viewpoint was used as the point of departure for the research for this study. The concept of knowledge embedded in Communities is further elaborated upon in chapter 4.

The concept of knowledge can be defined in various ways, as a study of literature will show, but only those definitions that are pertinent to this study are presented below.

2.2.2 DEFINITION OF KNOWLEDGE

Webster's New World Dictionary of the American Language (1964) describes knowledge as *"organized information applicable to problem solving".*

Knowledge according to Van der Spek and Spijkervet (1997: 36) is *"the whole set of insights, experiences, and procedures which are considered correct and true and which therefore guide the thoughts, behaviour, and communication of people".*

Wiig (2000: 26) regards knowledge as something that *"is possessed by humans or inanimate agents as truths and beliefs, perspectives and concepts, judgments and expectations, methodologies and know-how. Knowledge is used to receive information - to recognize and identify; analyse and interpret, and evaluate, synthesize, assess and decide; adapt, plan, implement and monitor - to act".*

For Bohm (1994: x-xv), and Gick and Holyoak (1987: 13-46), knowledge *"is the combination of information, context and experience. Context is viewed as an individual's framework for viewing life, which includes influences like social values, religion, cultural heritage and gender. Experience is seen as previously acquired knowledge. Knowledge that is transferred from one person to another is drawn into the receiver's context and experience".*

Turban and Frenzel (1992: 10-11) regard knowledge as *"understanding; learning; a clear and certain perception of something; all that can be perceived or grasped by the mind;*

practical experience or skill; cognisance; recognition; and organised information applicable to problem solving".

Taylor (1996: Online) views *"knowledge as formulated in the minds of individuals through experience".* The sharing of knowledge happens between groups and communities through shared experience and through the transfer of tacit and explicit knowledge. This means that the individual and community have a pool of knowledge to draw from (Ponelis and Fairer-Wessels 1998: 2).

Ponelis and Fairer-Wessels (1998: 2-3) consider knowledge as *"what is known, and requires one party to internalise what has been received through the process of informing"*. In other words, nothing can be knowledge unless it is internalised within the mind; everything outside the mind is information, which is only potential knowledge.

For the purpose of this study, the following definition can be synthesized from the above definitions: **Knowledge can be defined as that which is known, in other words a set of insights, experiences, understanding, learning, truths, beliefs, perspectives, concepts, judgments, expectations, methodologies and expertise, that are internalised or formulated in the minds of individuals, which can be tacit or explicit, and guide people's actions.**

In organisational contexts, the emphasis is placed increasingly on the management of knowledge and knowledge work. The next section provides an explanation of the concept "knowledge work".

2.2.3 KNOWLEDGE WORK

Knowledge work, according to Davenport, Jarvenpaa and Beers (1996: 54), is about the "*acquisition* (knowledge capture), *creation, packaging, application*" or re-use of knowledge. Broadbent (1998: 30) views knowledge workers as workers who exercise their intellects to execute these activities. She considers knowledge work as inherently hard to manage and characterises it as "*having variety and uncertainty in inputs and outputs, unstructured and individualized work rules and routines, lack of separation among process, outputs and inputs, lack of measures, worker autonomy, high variability in performance across individuals and time, lack of information technology support,*

etc." (Broadbent 1998: 31). She further emphasizes, *"as work becomes more knowledge intensive, communication becomes more important"* (Broadbent 1998: 31). Knowledge about people in the organisation and their expertise becomes pivotal. This is where Communities of Practice[3] can play a more active role.

Knowledge can however manifest in a variety of forms or types, and it was deemed important to also investigate these forms or types for the benefit of this study.

2.2.4 TYPES OF KNOWLEDGE

As knowledge can take different forms in different situations, it was deemed important for clarity to have an overview of some of the types of knowledge as identified in literature. However, only those of value to this study were included.

Aristotle was the first to make a distinction between tacit and explicit knowledge, and this distinction is still made by most knowledge management authors. Because this study focuses on Communities of Practice in organisations (libraries), organisational knowledge and cultural knowledge were included in this discussion. Cultural knowledge as identified by Choo (2000: 395) was also included as another type because of its implications for Communities of Practice.

2.2.4.1 Tacit knowledge

Tacit knowledge according to Choo (2000: 395) is personalized knowledge, which is utilized in the performance of tasks, and also to gain understanding of the work environment. This type of knowledge is learned through experience, and by developing a sense of feel and ability to make intuitive judgements about the successful execution of an activity (Choo 2000: 395). Nonaka (1998: 27-28) regards tacit knowledge as very personal and difficult to formalise and to communicate to others. According to him, tacit knowledge is deeply grounded in action and in individuals' commitment to a specific context. Snowden (1998: 10) on the other hand views tacit knowledge as something we simply know. The management of tacit knowledge according to Willard (1999: 45) is only possible when people have the relevant expertise or experience, and are willing and motivated to apply their knowledge. Communities of Practice, because of their

3. See Chapter 4.

informal character, can provide the necessary space where tacit knowledge can be shared amongst members. Through sharing tacit knowledge with each other, it can be embedded in other members' minds, or converted into explicit knowledge in the form of artefacts like newsletters, websites, reports, diagrams etc.

2.2.4.2 Explicit knowledge

Choo (2000: 396) describes explicit knowledge as formal knowledge that can easily be communicated or diffused by using a system of symbols. This type of knowledge can be object-based, i.e. using strings of symbols, e.g. words, numbers, formulas; can be embodied in physical entities, e.g. models, substances or equipment; or can be rule-based, e.g. rules, routines, or operating procedures (Choo 2000: 396).

Nonaka (1998: 27) describes explicit knowledge as formal and systematic knowledge that is easily communicable and shared in product specifications, scientific formula, or a computer programme. According to Ponelis and Fairer-Wessels (1998: 3), explicit knowledge can be articulated in formal language and transmitted among individuals. Snowden (1998: 9-10) on the other hand equals explicit knowledge with information; in other words, everything outside the mind or documented is regarded as explicit knowledge. Explicit knowledge can be shared in a Community of Practice through the sharing of files, reports, etc. This is then converted into tacit knowledge through the process of internalisation, using simulation or storytelling.

2.2.4.3 Organisational knowledge

According to Broadbent (1998: 25) *"knowledge becomes organisational knowledge when there are management processes in place which capture that often personal, tacit information (knowledge about products, processes, as well as why some of these are not working), from which others in the organisation can learn, and make decisions"*. Machlup (1980: 31-33) calls this type of knowledge "practical knowledge", in other words knowledge that is useful in an individual's work, decisions and actions.

Brooking (1996) as quoted in the *Knowledge Management Handbook* (1999: 1-3) regards organisational knowledge as *"the collective sum of human-centred assets, intellectual property assets, infrastructure assets, and market assets".*

In *Knowledge Management and Organizational Design* (1996: 2), organisational knowledge is viewed as *"processed information embedded in routines"*, i.e. systems, processes, products, rules and culture of an organisation that enable action; in other words, explicit knowledge.

Integrating these viewpoints, one could describe organisational knowledge **as the sum of the intellectual capital[4] (expertise and know-how about products, processes, culture and values) as well as explicit knowledge of the organisation (embedded in routines, systems, products, rules and culture of an organisation), which enable action.** Because organisational knowledge consists partly of tacit knowledge, Communities of Practice can be a very helpful instrument to embed and manage it.

2.2.4.4 Cultural knowledge

Sackman (1991: 34) describes cultural knowledge from a structural and developmental perspective. She defines the **structural** side of culture as *"sets of commonly held cognitions that are held with some emotional investment and integrated into a logical system or cognitive map that contains cognitions about descriptions, operations, prescriptions and causes. These are habitually used, and influence perception, thinking, feeling and acting"*. Sackman (1991: 34) further stresses that the structural components of culture are present at any point in time, but that the cultural content may vary, depending on its development. The **developmental perspective** *"addresses the formation, change, and perpetuation of cultural cognitions over time in the form of cultural knowledge. These cognitions become commonly held in processes of social interaction, can be introduced into the organisation based on outside experiences, can emerge from growing experiences, and can be invented and/or negotiated. When repeatedly applied they become attached with emotions and assigned with degrees of importance - also commonly held. They are relatively stable over time and are accumulated in the forms of different kinds of cultural knowledge, which she labels as dictionary, directory, recipe, and axiomatic knowledge"*. When new members join an

4. Intellectual capital: knowledge that can be utilized for some moneymaking or other useful benefits. It can include the skills and knowledge that an organisation has developed about how to deliver its products and services, skills and knowledge of individual or groups of employees whose knowledge is deemed critical for the organisation's success, as well as the totality of its documents on processes, customers, research results, and other information of value to competitors (Intellectual capital: Online).

organisation, cultural knowledge is passed on to them to enable them to adjust to their new environment. Every organisation has its own organisational culture and cultural knowledge, which have developed over a period of time and which is held in processes of social interaction. When new employees start in an organisation it is often difficult for them to internalise the cultural knowledge of the organisation. As this can take a long time, Communities of Practice can provide the ideal spaces where newcomers or novices can acquire cultural knowledge much quicker through interaction with other members.

Other types of knowledge found in literature but not pertinent to this study include: indigenous knowledge, Machlup's five categories of knowledge, namely practical knowledge, intellectual knowledge, small talk knowledge and past time knowledge, spiritual knowledge and unwanted knowledge, and Jantz's three types of knowledge namely public knowledge, shared expertise and personal knowledge (Jantz 2001: 34; Machlup 1980: 108).

Having an understanding of the types of knowledge is however not enough to understand the concept better. Questions that remain include how knowledge is created, transferred and captured. The researcher tried to answer this question through an exposition of knowledge processes that can help in knowledge creation, transfer and capturing.

2.2.5 KNOWLEDGE PROCESSES

Various knowledge processes exist, e.g. knowledge creation, knowledge capture, knowledge flow/transfer, knowledge retrieval, packaging of knowledge, knowledge embedding, knowledge application, knowledge re-use, etc. For the purpose of this study, the focus was on knowledge creation, transfer and capture.

2.2.5.1 Knowledge creation

According to Shin, Holden and Schmidt (2001: 340), knowledge creation relates to knowledge addition and/or the correction of existing knowledge. Machlup (1980: 173) uses the term "generation" to describe creation. According to him, knowledge generation refers to the generation of socially new knowledge, which was previously

unknown to anyone and now known only to the one person or small group who have come upon it. Nonaka (1994), Nonaka and Takeuchi (1995), and Nonaka, Reinmoeller and Senoo (1998) describes this process further in their comprehensive model of knowledge creation (SECI model), which have been included in this study in Section 2.6.1. According to this model, knowledge is created through the processes of socialisation, externalisation, combination and internalisation. However, creating/generating knowledge without disseminating/transferring it makes it socially worthless, as well as unascertainable (Machlup 1980: 175). In other words, for new knowledge to have value, it has to be shared/transferred.

2.2.5.2 Knowledge flow/transfer

The concept of knowledge flow/transfer varies substantially in literature. Some authors regard knowledge transfer as transfer of skills (knowledge) and technology between organisational subunits (Gupta and Govindarajan 1994: 444). Others focus on the transfer of business practices (Darr, Argote and Epple 1995; Szulanski 1996). Machlup (1980: 170) views knowledge flow as different from the flow of material goods. The flow of goods from one person to another reduces the stocks of the former and increases the stocks of the latter. In contrast to this, a flow of knowledge may or may not increase the recipient's stock of knowledge, without reducing the stock of knowledge of the sender (Machlup 1980: 170). Some authors like Szulanski (1996; 28-29) considers knowledge flows as a multistage process that might involve initiation, implementation, ramp-up, and integration, while Hansen (1999: 82-83) regard it as search and transfer. Schulz (2001: 662) on the other hand defines knowledge flows as *"the aggregate volume of know-how and information transmitted per unit of time"*. Authors that view it from information-processing theories regard knowledge flows as organisational response to task uncertainty, where task uncertainty is regarded as the difference between the amount of information required to perform a task and the amount of information already possessed by an organisation (Galbraith 1973: 5; Van De Ven, Delbecq and Koenig 1976: 328-329).

For the sake of this study, the researcher described knowledge flow/transfer in an organisation as the transfer/flow of tacit knowledge (e.g. skills, know-how, expertise, etc.), or the transfer/flow of explicit knowledge (e.g. in the form of documents, books, articles, graphs, procedures etc.) from the stock of knowledge of a sender, to the

recipient's stock of knowledge (adding to it or not), with the main purpose of enhancing the intellectual capital of an organisation.

Knowledge can be transferred in a variety of ways. A few of these are highlighted:

a) Transferring explicit knowledge

Some of the methods for transferring explicit knowledge are: books, journals, broadcasting, motion picture films, performing arts, using online systems for OCR reading, storage and retrieval of vital documents, and by using e-mail systems, conferencing systems and word processing, computer archives, etc. (Machlup 1980: 171; Sveiby 1997: 87). Explicit knowledge can be transferred through the processes of internalisation and combination (See the SECI model in Section 2.6.1).

b) Transferring tacit knowledge

Tacit knowledge can be transferred from person to person or from records to persons. This occurs through working together in practice. The process happens quite unknowingly. The SECI model in Section 2.6.1 shows how tacit knowledge is transferred through the processes of externalisation and socialization.

As part of the transfer process, knowledge has to be captured in some or other way so that it can be of value to the rest of the organisation. For this reason, the concept of knowledge capture was included in this study.

2.2.5.3 Knowledge capture

When knowledgeable staff leaves an organisation, valuable undocumented knowledge also leaves the organisation. Though knowledge can flow between staff of an organisation, it is imperative that this knowledge be elicited, stored, and presented (captured) before the staff member leaves, so that it can be of value to the rest of the staff of the organisation.

The first step in knowledge capture is to set up a knowledge capture plan. *"The plan should identify the specific knowledge elicitation (capturing) method(s); it should define*

the methods of storage, and describe how the stored knowledge will be retrieved" (Hanes and Gross 2002: 2). However, a number of factors must be considered, namely the type(s) of knowledge, availability of staff members, and the skills and capabilities of the staff responsible for the knowledge capture (Hanes and Gross 2002: 2). The next step is to implement the plan and to format the elicited knowledge and package it in knowledge modules. Hanes and Gross (2002: 2) describes knowledge modules as explicit knowledge that are related to a specific job, activity or task, which were elicited from an expert, evaluated, edited and formatted to be in a form usable to others, stored in paper or electronic format, and which can be retrieved when needed.

Knowledge can be elicited through a variety of methods, which can include story telling, interviews, scenarios, simulations/role-play, and games, etc. and can be presented by using modelling techniques such as concept ladders, process maps, domain hierarchies, taxonomies, rules, etc. (Cadas 2003: 3).

Knowledge creation, knowledge transfer and knowledge capture are some of the main building blocks through which knowledge can be managed in a Community of Practice. It is imperative in today's turbulent environment that organisations create or generate new knowledge, and especially tacit knowledge. However, this type of knowledge cannot stay in the minds of one or a few individuals. By sharing or transferring this knowledge to other colleagues, the knowledge gets social value. Communities of Practice provide the necessary trusting platform where new knowledge can be created and transferred to other members, using some of the knowledge capturing techniques mentioned above. For a further discussion of the concept of Communities of Practice, as well as the role of knowledge in them, refer to Chapter 4.

Before determining what is meant by the concept knowledge management it was deemed necessary to first examine the concept of knowledge. Having done this, the researcher initiated the discussion on knowledge management with a discussion of the definitions of knowledge management in the next section.

2.3 DEFINITION OF KNOWLEDGE MANAGEMENT

A variety of definitions on knowledge management exist in literature, but for the purpose of this study, the following definitions were deemed important:

Broadbent (1998: 25) defines knowledge management as *"purposeful management processes which capture often personal and contextual information that can be used for the organisation's benefit. Knowledge management is a form of expertise-centred management focussing on using human expertise for business advantage"*.

Broadbent (1998: 25) continues by saying that knowledge management *"is about enhancing the use of organisational knowledge through sound practices of information management and organisational learning, with the purpose to deliver value to business"*.

According to Broadbent (1998: 24), the foundations on which knowledge management rests are:

- The utilization and exploitation of the organisation's information;
- The application of people's competencies, skills, talents, thoughts, ideas, intuitions, commitments, motivations and imaginations.

Page-Shipp (2001) describes knowledge management as *"an organisational discipline that optimises culture, processes and infrastructure in creating, using and especially re-using knowledge, to ensure that every client receives optimal value-addition to his/her "capacity for informed action" and thereby improves organisational sustainability".*

"Knowledge management is a discipline that promotes an integrated approach to identifying, managing and sharing an organisation's information assets, including databases, policies and procedures as well as unarticulated expertise and experience resident in individual workers" (Knowledge Management, Gartner Group 1996: Online).

"In the academic world, knowledge management is a new dimension of strategic information management" (Ponelis and Fairer-Wessels 1998: 5).

"The term knowledge management is used in the corporate world to differentiate between management of content (knowledge management), management of records (records management) and management of information technology and systems (referred to incorrectly as information management)" (Ponelis and Fairer-Wessels 1998: 6).

"Knowledge management is the explicit and systematic management of vital knowledge and its associated processes of creating, gathering, organising, diffusion, use and exploitation. It requires turning personal knowledge into corporate knowledge that can be widely shared throughout an organisation and appropriately applied" (Skyrme 2003: Online).

"Knowledge management involves capturing the knowledge, the wisdom, the added value experiences of individuals within an organization, making it easy to find again, and in so doing, preserving it as an organizational asset" (Perez 1999: 75).

Kim (1999: Online) describes knowledge management as *"a discipline that promotes an integrated approach to identifying, managing and sharing all of an organisation's knowledge assets including unarticulated expertise and experience resident in individuals".*

"Knowledge management is the name of the concept in which an enterprise consciously and comprehensively gathers, organizes, shares and analyzes its knowledge in terms of resources, documents, and people skills" (Knowledge Management, SearchDomino.com: Online).

These definitions were integrated and synthesized by the researcher into the following definition: **Knowledge management is a discipline that utilizes and exploits all of an organisation's knowledge assets, including all its information (explicit knowledge) as well as its unarticulated experience and expertise (tacit knowledge) resident in individuals so as to ensure sustainability as well as competitive advantage. This is done by utilizing its culture, processes and infrastructure to create, identify, capture, share, use and re-use knowledge so that it adds optimal value to every member and every client's knowledge base.**

In the above definition, knowledge management is described as a discipline. The question is - can knowledge management really be described as a discipline? This question is addressed in the next section.

2.4 KNOWLEDGE MANAGEMENT AS A DISCIPLINE

To determine whether knowledge management can be described as a discipline, it is important to have an understanding of what a discipline is. The concept of an academic discipline according to Becher (1989: 19) is not clear-cut, as in the case of many concepts, it allows for some uncertainties of application. He links disciplines to the existence of relevant academic departments that represent them. He furthermore describes disciplines as having international currency, a general set of notions of academic credibility, intellectual substance, and having appropriate subject matter.

Another way of looking at disciplines is through a structural framework, and by *"noting how they are manifested in the basic organisational components of the higher education system"* (Becher 1989: 19).

King and Brownell (1966: 68-95) describes a discipline as:

- **a community:** in other words *"a defined area of study, the network of facts writings and other works of scholars associated with the field, or as the corps of human beings with a common intellectual commitment"* (King and Brownell 1966: 68);
- **an expression of human imagination:** in other words, *"the creation of novel mental images in a variety of forms"* (King and Brownell 1966: 71);
- **a conceptual structure:** in other words, a full set of ideas consisting of classes of phenomena and relationships between them (King and Brownell 1966: 81);
- a network of communications (King and Brownell 1966: 86);
- a tradition (King and Brownell 1966: 75);
- a particular set of values and beliefs (King and Brownell 1966: 87);
- **a domain:** "in other words, the natural phenomenon, process, material, social institution, or any other concern on which members of the discipline focus" (King and Brownell 1966: 74); and
- a mode of enquiry.

Toulmin (1972: 139) views disciplines from an epistemological perspective, and describes disciplines as *"each characterised by its own body of concepts, methods and fundamental aims"*. Other authors describe them as organised social groupings (Whitley 1976; Whitley 1984). Most authors however emphasize both the substantive content (forms/domains of knowledge) and social behaviour (knowledge communities) (Becher 1989: 20).

Van der Westhuizen (2002: 94) suggests that knowledge management should perhaps not be regarded as a discipline in itself, but should be viewed in terms of organisational design. He then goes on to describe it as a *"change management term"*.

The researcher differs from this viewpoint and is of the opinion that knowledge management could be described as a discipline, as it complies with most of the characteristics of a discipline as described above. Knowledge management has international currency, a general set of notions of academic credibility, intellectual substance, and has appropriate subject matter. It also has substantive content (a domain of knowledge) and is characterised by social behaviour (knowledge communities).

Having described knowledge management as a discipline, one could ask what value it has for an organisation? This question is addressed in the next section.

2.5 THE PURPOSE AND VALUE OF KNOWLEDGE MANAGEMENT

The purpose of knowledge management according to Wiig (2000: 6) is to build and exploit intellectual capital effectively and gainfully in an organisation. Knowledge management also assists organisations to become more competitive, by exploiting the capacities of their people to be more flexible and innovative. In practice, this means drawing out the tacit knowledge (observed and learned from experience) that people have (The Learning Organisation: Managing Knowledge of Business Success 1995: 17).

Improved knowledge and its use lead to less re-work and hand-offs, quicker analysis, decision and execution, particularly of non-routine tasks and other desirable and work-reducing effects (Wiig 2000: 7). When experts provide knowledge openly and widely, they tend to be considered important by their peers and gain status and recognition

(Wiig 2000: 7). In *Benefits of Knowledge Management* (2001: Online), possible benefits of knowledge management in an organisation are listed. According to them, knowledge management:

- generates new ideas and creativity;
- accelerates innovation;
- improves and accelerate learning;
- leads to greater productivity and efficiency;
- improves decision-making;
- produces and conserves new value such as intellectual property assets;
- generates new wealth and increased returns and revenue;
- opens up new markets;
- enables sustainable organic growth;
- mitigates risk;
- helps in the development of new business models;
- helps create a more adaptive responsive and dynamic organisation;
- enhances team corroboration and coordination;
- improves the ability of the organisation to manage change;
- helps the organisation avoid waste and duplication by knowledge re-use;
- helps knowledge workers handle infoglut and information-overload;
- helps the organisation to develop more network connections/knowledge nodes;
- helps in the gathering of superior business and competitive intelligence.

Having discussed the value of knowledge management for organisations, one could very well ask how knowledge management operates in practice. In order to gain a better understanding of the functioning of knowledge management, a variety of models have been suggested through the years. A discussion of these models is thus essential.

2.6 KNOWLEDGE MANAGEMENT MODELS

Though a variety of models exist on knowledge management, only two knowledge management models pertinent to this study were included to give a greater understanding of the concept. These two models are the SECI Model and the Cynefin Model.

2.6.1 THE SECI MODEL

According to the SECI model, there are two types of knowledge, namely explicit and tacit, and the interactions between these two types leads to a spiralling process of knowledge creation (Nonaka and Konno 1998: 43). Four processes of moving between tacit and explicit states are identified, namely: socialisation, externalisation, combination and internalisation, which form the acronym SECI (Nonaka and Konno 1998: 43-45).

The SECI model was subsequently republished in 1998 in Nonaka and Konno (1998), using the concept of "Ba". The model is illustrated in figure 2.1.

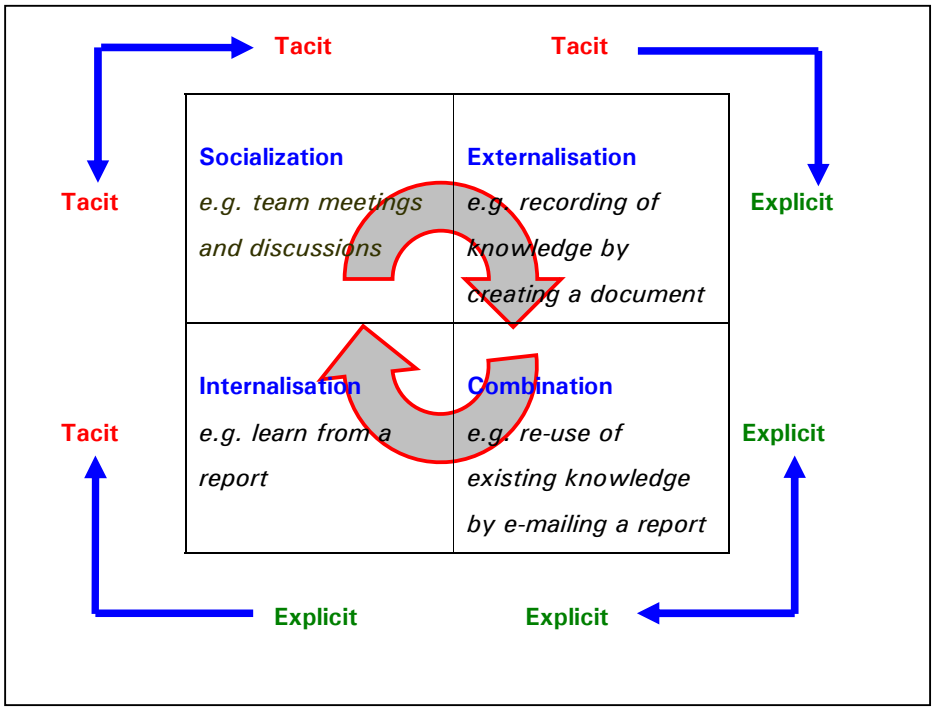

Figure 2.1: SECI Model (Nonaka and Takeuchi 1995)

The SECI Model can be interpreted as follows:

2.6.1.1 Socialisation: Tacit-to-Tacit

The process of socialization involves the sharing and dissemination of tacit knowledge between people. *"Tacit knowledge though can only be shared if the self is freed to*

become a larger self that includes the tacit knowledge of the other. *Self-transcendence is seen as fundamental to sharing individual tacit knowledge"* (Nonaka and Konno 1998: 42). The term *socialisation* is used to emphasize that *"tacit knowledge is exchanged through joint activities such as being together, spending time together, and living"* and working *"in the same environment, etc."* (Nonaka and Konno 1998: 42). In practice, this means that knowledge is captured through physical proximity to others (Nonaka and Konno 1998: 44).

Socialisation can manifest in different ways, and only a few of these will now be discussed.

a) Socialization using the open-office space

People working in an open-space office spend a great deal of their time either on the phone or chatting with each other, and by doing so create tacit knowledge without deliberation or reporting. Just by being present, people can absorb all they need to know to function in their profession (Sveiby 1997: 88). In this atmosphere, people learn from one another, and tacit knowledge is exchanged between each other. This also helps new staff members to adjust very quickly to their new workplace.

b) Socialization using Piggybacking

Piggybacking can be used as a method through which senior professionals can show their skills to juniors to imitate (Sveiby 1997: 89). Many firms staff their teams with at least one very junior member, who has the double task of doing the dirty work and observing and learning (Sveiby 1997: 89). The tacit techniques of the profession are thus learned on the job.

c) Socialization using Communities of Practice

These informal groups does not necessarily evolve in an open-office space, but are formed by people sharing a common domain, who realize that they can benefit by sharing ideas, expertise, experiences and skills with one another. These people can be scattered throughout an organisation or even across organisational boundaries. The

sharing in these communities can take place anywhere, e.g. at the coffee machine, tearoom, or even online. This is the process on which this study was based.

2.6.1.2 Externalisation: Tacit to Explicit

People usually express tacit knowledge externally in comprehensible forms (explicit knowledge), so that it can be understood by others and can be easily produced (Nonaka and Konno 1998: 42; Sveiby 1997: 87). Through conceptualisation, elicitation, and articulation, some proportion of a person's tacit knowledge may be captured in explicit form (Sveiby 1997: 87). The problem with this method is that it does not take context into consideration. The receiver cannot grasp the full meaning of the giver without context. However, this does not mean that written knowledge has no value, but that there are better ways of knowledge transfer, e.g. talking and showing what you mean (Sveiby 1997: 87). This is where socialization and internalisation come into the picture.

2.6.1.3 Combination: Explicit-to-Explicit

Combination according to Nonaka and Konno (1998: 43) involves *"the conversion of explicit knowledge into more complex sets of explicit knowledge. New knowledge generated in the externalisation stage transcends the group in analogue and digital signals."* Three processes are identified on which the combination phase relies: capturing and integrating new explicit knowledge by collecting externalised knowledge (e.g. public data) from inside or outside the organisation and then combining the data; secondly by disseminating explicit knowledge directly by using presentations or meetings; and thirdly by editing or processing explicit knowledge to make it more useable (e.g. reports, plans, tables, graphs, etc.) (Nonaka and Konno 1998: 43).

2.6.1.4 Internalisation: Explicit to Tacit

"Internalisation of newly created knowledge" according to Nonaka and Konno (1998: 43) *is the conversion of explicit knowledge into tacit knowledge"*. In an organisational context, the individual has to identify the knowledge relevant to him- or her within the organisational knowledge (Nonaka and Konno 1998: 43). Internalisation further relies on two dimensions: firstly *"explicit knowledge has to be embodied in action and practice"* (this includes methods about strategy, tactics, innovation, or improvement), and

"secondly there is a process of embodying the explicit knowledge by using simulations or experiments to trigger learning by doing processes" (Nonaka and Konno 1998: 43).

Knowledge can be internalised in a variety of ways, but only those pertinent to this study will now be discussed.

a) Internalisation using simulation/role-play

According to Sveiby (1997: 89), practical knowledge is best transferred when we use our whole bodies, and that is the reason why games, simulations and role-play are so effective in transferring knowledge. In simulations, the real thing is emulated to help the participant(s) to acquire the necessary knowledge (skills, expertise, etc.) (Sveiby 1997: 89).

b) Internalisation using storytelling

Stories are narrative frameworks people create to make sense of the world, to share experiences, to convey meaning and to pass on what they know (Gill 2001: Online). Stories are remembered much easier than facts, and are thus powerful tools with which knowledge can be embedded or internalised. In Communities of Practice, storytelling is a powerful method with which to transfer knowledge, and this will be expanded upon in the next chapter of this study.

Communities of Practice can provide the ideal mechanism wherein the SECI model can be accommodated. More details on the concept of Communities of Practice can be found in chapter 4.

The second model included in this study is the Cynefin model.

2.6.2 THE CYNEFIN MODEL

Cynefin is a Welsh term that describes *"the place of your birth and of your upbringing, the environment in which you live and to which you are naturally acclimatised"* (Sinclair 1998 as cited by Snowden 2000: Online).

The Cynefin model focuses strongly on how people make sense of the world. It emphasizes three types of systems, namely complicated, complex and chaotic systems, which can best be understood through two distinctions. The first distinction is between **complex and complicated** systems. To illustrate this, Snowden (2002: 7) uses the example of an aircraft as a **complicated system** with thousands of knowable, definable components that are capable of being catalogued, as well as all the relationships between components. Cause and effect can be separated, and by understanding their linkages, outcomes can be controlled.

For a **complex system**, Snowden (2002: 7) uses human systems as examples. According to him, a **complex system** comprises many interacting agents, an agent being anything that has identity. Humans exist in many identities; a person can be son, father, or brother in different contexts. He or she can also have workgroup identities, which can both be formal and informal, along with various social groupings (Snowden 2002: 7). As one moves among identities, one observes different rules, rituals and procedures unconsciously. This means that components and their interactions are ever changing and can never be quite pinned down (Snowden 2002: 7). In other words, the system is irreducible. Cause and effect can therefore not be separated, because they are intertwined (Juarrero 1999: 40-41).

The mistake that organisations tend to make is to study past events in order to create predictive and prescriptive models for future decisions based on the assumption that they are dealing with a complicated system, when in fact they are dealing with a complex system (Snowden 2002: 7).

The second distinction is between a **complex system** comprising many interacting identities and a **chaotic system** in which all connections have been broken down, and which is in a constant state of turbulence (Snowden 2002: 8). Complex and chaotic systems should not be confused. In a complex system, the emergence of patterns can be recognised, disrupted, reinforced, and seeded (Snowden 2002: 8). Interaction of identities also creates coherence and meaning. In a chaotic system, no such patterns are possible, unless we intervene to impose them (Snowden 2002: 8). The Cynefin model is illustrated in Figure 2.2.

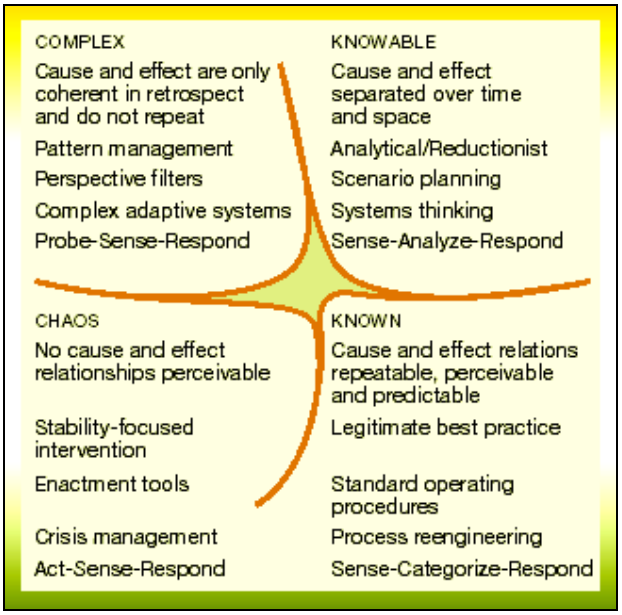

Figure 2.2: The Cynefin Model (Kurz and Snowden 2003: 468)

The Cynefin model (see Figure 2.2) consists of four open spaces or domains of knowledge, all of which have validity within different contexts. These domains are:

- **Known Domain**

  In this domain, cause and effect relations are repeatable and predictable, in other words the root cause of issues that are commonly experienced are well understood and outcome is predictable with certainty. Diagnosis of issues is done through classification of a problem. Organisations in this domain are characterised by strong management and bureaucracy. They rely on manuals, procedures and policy and do process re-engineering (Kurz and Snowden 2003: 468).

- **Knowable Domain**

  In this domain, cause and effect are separated over time and space. In other words, issues that are dealt with have not arisen before, but similar ones have, for which the cause was very clear. The plausible outcomes can thus be predicted with confidence and probability. Diagnosis of issues is done through analytical, reductionist and logical thinking, and with the help of experts. In other words, they sense, analyze and respond. Organisations in this domain do scenario planning, gather business/competitive intelligence, and do market

analysis (Kurz and Snowden 2003: 468). Communities of Practice (See Chapter 4) can be used as forums where experts can deal with issues and where others can learn from them for future action.

- **Complex Domain**

  In this domain, cause and effect are coherent in retrospect, but do not repeat. In other words, every time one thinks one has solved an issue it returns in a different form. There exist an infinite range of possible outcomes that aren't possible to predict beforehand. Diagnosis of issues is done through probing, sensing and seeding patterns and by exploring perspectives. In other words, they probe, sense and respond. For example, the organisation probes the issues at hand, chooses a pattern (intervenes), and stabilises it. Success of the decision can only be determined in retrospect. Organisations in this domain use narrative techniques (e.g. storytelling), interviews, future-backwards exercises, network analysis etc. (Kurz and Snowden 2003: 468). Communities of Practice (See Chapter 4) as informal groups can be used with great success in organisations that find themselves in this domain, to help stabilise patterns in the organisation.

- **Chaos Domain**

  In this domain, no cause and effect relationships can be discerned. In other words, because issues are implausible, they cannot be expected. Outcomes can thus not be explained or predicted. Diagnosis cannot be done and one just has to act. The organisations in this domain do crisis management. In other words, they act, sense, and respond (Kurz and Snowden 2003: 468).

Communities of Practice as discussed in Chapter 4 can play important roles in the different sections of these models.

Having defined knowledge management, discussing its traits as a discipline, and studying two knowledge management models, has answered the question of what knowledge management is. The question that remains is - where did knowledge management come from? This question is addressed in the next section.

2.7 THE BACKGROUND TO KNOWLEDGE MANAGEMENT

2.7.1 DIFFERENT PERSPECTIVES ON KNOWLEDGE MANAGEMENT

In the discussion on knowledge management, it is important that the different perspectives on information management as found in literature are examined. This will serve as point of departure when approaching the topic of knowledge management. Two views of information management emerge from the literature (Bergeron 1996: 266-277): the **information technology perspective** and the **integrative perspective**. *"Literature with an information technology perspective"*, according to Bergeron (1996: 266), *"focus on information management as an expansion or sub-discipline of management information systems or as a guide for better management of computer-based information systems".* Bergeron (1996: 268) describes literature with an **integrative perspective** as those who view information management as a "*management approach and function that seeks to integrate and harmonise corporate information sources, services and systems, and also to create a synergy between external and internal corporate information resources".*

These two perspectives also serve as a foundation when approaching the topic of knowledge management. Authors with an **information technology perspective** believe that knowledge management is a totally new concept, in other words, the management of explicit and tacit knowledge are both new (Snyman 2001: 274). Those supporting this approach (especially in the corporate business world), regard knowledge management as the management of content and information management as the management of information technology (Ponelis and Fairer Wessels 1998: 5-6).

Authors with an ***integrative perspective*** to information management view knowledge management as the management of tacit and explicit knowledge in an integrative manner (Snyman 2001: 274). This is the approach that has been followed in this study. These approaches form the basis from which the background to knowledge management can be studied.

The mentioned approaches form the basis from which the background to knowledge management can be studied. However, keeping these approaches in mind, the researcher was still confronted with the question of where knowledge management

originated. In other words, what led to the development of knowledge management as a concept? With this in mind, the researcher embarked on identifying the driving forces (or drivers) that led to the development of the field.

2.7.2 THE DRIVERS OF KNOWLEDGE MANAGEMENT

Knowledge management developed in response to specific driving forces, which will now be discussed.

2.7.2.1 Globalisation of business

Globalisation has speeded up all elements of global trade, and information technology and decentralized markets make it possible for organisations to bring new products and services to wider markets more rapidly. This compels organisations to ask themselves what they know; who knows it and what it is they don't know, but should know (Prusak 2001: 1002). Knowledge management plays an important role in this.

2.7.2.2 Sophisticated customers

Customers have become more demanding and customized products and services that support their success are increasingly in demand. This means that organisations that want to survive, or have the competitive edge over their competitors, have to keep on improving their understanding of customer needs and capabilities (Wiig 2000: 11).

2.7.2.3 Sophisticated competitors

Competitors have become more sophisticated in products they offer and services they render. This compels organisations to constantly implement innovations in products, services and practices that can ensure that they have the competitive edge over competitors. However, to keep this up, constant learning is essential in order to build competitive expertise (Wiig 2000: 11).

2.7.2.4 Sophisticated suppliers

The capabilities of suppliers are continuously improving, and they can be valuable partners in the creation of innovations to deliver sophisticated products. Organisations must therefore have an understanding and knowledge of new supplier capabilities and how to integrate them with internal efforts, directions and culture (Wiig 2000: 11).

2.7.2.5 Ubiquitous computing and increased technological capabilities

Ubiquitous and transparent computing and new advances in technology and applied artificial intelligence have expanded the access to information dramatically, so that people increasingly have access to information they need at any time and any place (Prusak 2001: 1002). An unintended consequence of this is the rise in value of knowledge that cannot be digitised, codified or distributed. This for instance includes components like judgment, design, leadership, better decisions, persuasiveness, wit, innovation, aesthetics, and humour (Prusak 2001: 1002). The field of knowledge management can help in the management of these knowledge skills. Knowledge management software that can assist in this includes groupware for collaborative work, knowledge encoding for knowledge bases, performance support systems, natural language understanding and advanced search engines (Wiig 2000: 11).

2.7.2.6 Knowledge centric view of the organisation

The ideas of organisations being primarily information processors, productive machines, or quasi-military structures are changing rapidly (Prusak 2001: 1003). An increasing number of academics, economists and commentators regard an organisation as a coordinated collection of capabilities, somewhat bound by its own history, and limited in its effectiveness by its current cognitive and social skills. According to Prusak (2001: 1003), the main building block or unit of analysis of these capabilities is knowledge, and especially the knowledge that is mostly tacit and specific to the organisation. Knowledge management can help in the management of these capabilities.

2.7.2.7 Bottlenecks in enterprise effectiveness

Restrictions (bottlenecks) in workflows and information that limit enterprise effectiveness have been removed or relocated to other sites through improvements such as: investments in technology and logistics, personnel working harder and longer, organized work flows and tasks, improved information for decision-making and other work, increased intelligent automation of routine, and simpler operational tasks (Wiig 2000: 11). Bottlenecks though have moved from visible and tangible sites to knowledge-intensive work areas that require better understanding and expertise (Wiig 2000: 11). Knowledge management can provide the necessary framework to create a better understanding and expertise.

2.7.2.8 Understanding of human cognitive functions

An effective organisation depends heavily on people and their work behaviour (Wiig 2000: 12). It is therefore essential to incorporate better professional understanding of cognitive aspects of how knowledge (understanding, mental models and associations) affects decision-making and the performance of knowledge-intensive work (Wiig 2000: 12). Knowledge management can help to create a better professional understanding of these cognitive aspects.

According to literature, knowledge management as a field developed through different stages, which are addressed in the next section.

2.7.3 THE KNOWLEDGE MANAGEMENT STAGES

According to Snowden (2002: 2), knowledge management developed through two stages and is currently moving into the third stage. He distinguishes the three stages as follows:

2.7.3.1 First Stage: Information for decision support

This stage covers the period before 1995 and focuses on appropriate structuring and flow of information to decision makers. It also focuses on computerisation of major business applications, which led to a technology-enabled revolution and was dominated

by perceived efficiencies of process re-engineering (Snowden 2002: 2). The result of this was that efficiencies were achieved at the cost of effectiveness and that people with experience and expertise were laid off (Snowden 2002: 2). There was a general failure to recognise the value of knowledge gained through experience, and through traditional forms of knowledge transfer such as apprentice schemes. The collective nature of much knowledge was problematic (Snowden 2002: 2). This situation was bound to change and in 1995 the second stage was heralded.

2.7.3.2 Second Stage - Nonaka's SECI Model

This stage was characterised by the popularisation of Nonaka and Takeuchi's SECI Model (see Section 2.6.1), which they introduced in 1995 (Snowden 2002: 2) and subsequently republished in 1998 in Nonaka and Konno (1998) using the concept of "Ba", meaning "shared space for emerging relationships".

This second stage in the development of knowledge management is one of the stages on which this study is grounded. Socialisation (see Section 2.6.1.1) can be used with great success in Communities of Practice as the purpose is the sharing of tacit knowledge through joint activities and being together. As Nonaka and Konno (1998: 44) stated, knowledge is captured through physical proximity to others. The transformation of tacit knowledge into explicit knowledge through the process of externalisation (see Section 2.6.1.2) can also be used with great success in Communities of Practice. The tacit knowledge shared in a Community of Practice can be recorded by someone in the Community and made available though documents, websites, virtual workspaces on portals, etc. Members in the Community can also take the explicit knowledge generated in the Community, add other explicit knowledge to this, and create new complex sets of explicit knowledge through the process of combination (see Section 2.6.1.3). These newly created sets of explicit knowledge are then assimilated (internalised) (see Section 2.6.1.4) into people's minds through different methods, e.g. storytelling and role-play simulations.

A new perspective on knowledge management has been developing over the past few years, which can be described as complicated-complex and chaotic. This is expanded upon in the next section.

2.7.3.3 Third Stage - Complicated-Complex and Chaotic

Stacy (2001: 4) was one of the first authors who promulgated a new theory concerning knowledge. He regards knowledge not as a "thing" or a system, but an ephemeral active process of relating. In other words, the thinking about knowledge in this stage goes beyond managing knowledge as a "thing" to managing knowledge as a "flow". In this stage, there is also a greater focus on context and narrative than on content (Snowden 2002: 3). Snowden (2002: 3) lists 3 heuristics to illustrate this change in thinking about knowledge:

- Knowledge can only be volunteered, not be conscripted;
- We can always know more than we can tell, and we can always tell more than we can write down;
- We only know what we know when we need to know it. In other words, human knowledge is highly contextual; it is triggered by circumstance.

These heuristics, according to Snowden (2002: 3), partially supports Stacy's (2001) view of knowledge as an active process of relating, but it does not mean that we have to abandon second-generation practice. Rather, we have to recognise its limitations.

Snowden (2002: 3) suggests the use of paradox, which allows one to embrace both Stacy (2001) and Nonaka and Takeuchi (1995). According to this view, knowledge is paradoxically both a "thing" and a "flow" (Snowden 2002: 3).

"The issues of content and context which runs through all three heuristics" are regarded by Snowden (2002: 7) as "the key to understanding the nature of knowledge transfer".

Two dimensions of context are further identified by Snowden (2002: 7), namely the dimension of abstraction and dimension of culture. In the dimension of abstraction, knowledge can be shared at different levels of abstraction, for example:

- Level 1 – Someone known asks a question, a brief exchange takes place in the context of common experience and trust, and knowledge is transferred.
- Level 2 – Someone not known asks a question. This time the conversation is more comprehensive and its takes longer to create a common context.

- Level 3 – This time the expert is asked to codify (e.g. write a book) his/her knowledge for potential future uses of that knowledge.

In the dimension of culture, Snowden (2002: 8) refers to Keesing and Strathern's (1998: 16) two cultures, namely the socio-cultural system (which includes tools and other artefacts that we use to create communities, the virtual environment we create and the way we create, distribute and utilise assets within the community), and culture as an ideational system (which *"comprise of systems of shared ideas, systems of concepts and rules and meanings that underlie and are expressed in the ways that humans live"*, in other words what humans learn). He sees both these cultures as key to knowledge flow in an organisation. This type of knowledge is painfully created at cost over generations, and need to be transferred to new members in the organisation. To enable staff to acquire (learn) these types of knowledge, provision must be made for space and time for new meaning to emerge. Communities of Practice could provide the necessary space.

These dimensions of abstraction and culture led to the development of the Cynefin sense-making model by Snowden (2002: 9), which was discussed in Section 2.6.2.

Most organisations today find themselves somewhere between being complicated or complex, and in this turbulent and ever changing environment, Communities of Practice can provide the necessary mechanisms for the dissemination of ideas, bringing coherence and meaning, helping to determine patterns, and helping with decision-making. Communities of Practice can thus also play an important role in this third stage of the development of knowledge management.

Knowledge management as a concept have its origin in an assortment of disciplines, and it is important to take notice thereof in order to have a greater understanding of background to the concept.

2.7.4 INTERDISCIPLINARY CHARACTER OF KNOWLEDGE MANAGEMENT

Knowledge management relies on a wide variety of disciplines, which gives it an interdisciplinary character.

2.7.4.1 Economics

From the discipline of economics, knowledge management inherited the notion that workers learn from experience, and that by developing and managing the learning strategies in an organisation, it can be more effective (Prusak 2001: 1004). Another driver of knowledge management that comes directly from economics is how to account for significant performance variation (Prusak 2001: 1004). According to Prusak (2001: 1004), the essential knowledge management question about the unit of analysis and the way it is measured also has its origin in economics.

2.7.4.2 Business theory

Business theory tries to understand work and its organisation (Wiig 2000: 5).

2.7.4.3 The rationalization of work (Taylorism)

According to this view, work, including knowledge work, can be broken down into individual motions, which are then analysed to determine which are essential. Unnecessary motions are eliminated. This helps organisations to become more productive (Taylorism n.d.: Online).

2.7.4.4 Total Quality Management (TQM)

TQM is a comprehensive approach to quality that focuses first on customer definitions of quality, and then on orienting the entire production function in an organisation towards achieving products and/or services of this quality (IEBM Dictionary of Business and Management 1999: 308). Knowledge or expertise in an organisation can help ensure that products and/or services of quality are delivered.

2.7.4.5 The cognitive sciences

The cognitive sciences try to understand how best to support knowledge workers' mental functioning (Wiig 2000: 21).

2.7.4.6 Artificial intelligence (AI)

AI is used to automate routine and assist knowledge-intensive work with reasoning and other high-level functions (Wiig 2000: 22).

2.7.4.7 Cybrary and Information sciences

"Cybrary" sciences (combination of library sciences and cyber space) and information sciences bring knowledge related services to everyone and build supporting infrastructure and special knowledge-related capabilities (Wiig 2000: 22).

2.7.4.8 Knowledge engineering

Knowledge engineering is used to elicit and codify knowledge (Wiig 2000: 22).

2.7.4.9 Ergonomics

Ergonomics is used to create effective and acceptable work environments, which in turn has an effect on knowledge flows within an organisation (Wiig 2000: 22).

2.7.4.10 Sociology

One of the aspects this field tries to understand is the role knowledge plays in society (Wiig 2000: 5). At macro level, Bell (1973) and Machlup (1980) were among the first to attempt to describe a Post-Industrial knowledge-based society. Their research showed the underlining principles of working with knowledge. At a micro level, sociology has a strong research interest in the complex structures of internal networks and communities, which is of great importance in knowledge management (Prusak 2001: 1004). Another aspect of sociology that knowledge management inherited, according to Prusak (2001: 1004), is its concern for social facts. Rather than building from theory, it looks at what people actually do; in other words, the circumstances in which they share or don't share knowledge, and the way they use, change, or ignore what they learn from others (Prusak 2001: 1004).

2.7.4.11 Philosophy and religion

These fields developed to understand the role and nature of knowledge, and by permission given to individuals "to think for themselves" (Wiig 2000: 5). As stated in Section 2.2.4, the Greek philosopher Aristotle was the first to make the distinction between tacit (know how) and explicit (know what) knowledge, but this was seemingly forgotten in the years after the Second World War (Prusak 2001: 1005). The computerisation of work and the accessibility to vast quantities of information in recent decades has however increased the value of tacit or undigitised knowledge significantly. Knowledge management re-acknowledged Aristotle's distinction from the start, and is today one of its main aspects (Prusak 2001: 1005).

2.7.4.12 Psychology

One of the aspects psychology tries to understand is the role of knowledge in human behaviour (Wiig 2000: 5). From psychology, knowledge management has inherited the concern about different kinds of knowing, as well as about how and why people learn, forget, ignore, act, or fail to act (Prusak 2001: 1005).

Together, all these disciplines enable knowledge management to have the intellectual scope and substance to wrestle with real human and structural complexities of knowledge in organisations (Prusak 2001: 1005).

2.8 SUMMARY

The study on knowledge management as a concept was preceded by a study on knowledge as a concept. Knowledge as a concept can be viewed from a variety of perspectives and those pertinent to this study were discussed. In the discussion, it was indicated that knowledge could be viewed as an object that exists independently of human action, or can be viewed as a mirror/representation of reality, or can be seen as inseparable from people's minds, or can be transferred throughout a Community of Practice without losing value (in other words, people know through socialisation).

Different definitions as found in literature was discussed and from these the researcher formulated a definition that synthesized the other definitions that were discussed. This

was followed by a discussion of the concept of knowledge work, which was described as the acquisition (knowledge capture), creation, packaging, application or re-use of knowledge. After this, the study focussed on the different types of knowledge pertinent to the study, namely tacit, explicit, organisational and cultural knowledge. The discussion then moved on to the different knowledge processes, namely knowledge creation, knowledge transfers and knowledge capture. The importance of these processes in Communities of Practice was then indicated.

Having studied the concept of knowledge, the researcher approached the concept of knowledge management with more clarity. First the definitions of knowledge management pertinent to this study were discussed and the researcher again synthesized these into his own definition of the concept. Next, the question of whether knowledge management could be classified as a discipline was addressed, and the researcher was of the opinion that it could indeed be classified as a discipline. This was followed by a discussion on the value/purpose that knowledge management has for organisations. Because knowledge management can be described by a variety of models, two pertinent models to this study was included in a discussion, namely the SECI model and the Cynefin model. In the discussion, the processes of socialisation, externalisation, combination and internalisation were touched upon and their value in Communities of Practice indicated. The discussion on the Cynefin model revealed that it focused on how people make sense of the world and emphasized three types of systems, namely complicated, complex and chaotic systems, which can be plotted in four domains, namely known, knowable, complex and chaotic. The background to the management of knowledge was explored next, by looking at the different perspectives on knowledge management, the driving forces that led to its development, and the different ages through which it developed, as well as its interdisciplinary character. It was found that knowledge management could be viewed from an integrative perspective and an information technology perspective, and that this study followed an integrative perspective to knowledge management. The driving forces that led to the development of knowledge management were shown to be globalisation of business, sophisticated customers, sophisticated competitors, sophisticated suppliers, ubiquitous computing and increased technological capabilities, a knowledge centric view of the organisation, bottlenecks in enterprise effectiveness, and moves to understand human cognitive functions. Next, the researcher indicated that knowledge management developed through three stages, namely information for decision support, the SECI

Model and the Complex-complicated chaotic stage. Finally, the researcher listed the different disciplines that give knowledge management its interdisciplinary character.

Knowledge in individuals or organisations can be increased through learning. Broadbent (1998: 25) describes knowledge management as the process through which the use of organisational knowledge is enhanced through sound practices of information management and organisational learning. It therefore seems that a link exist between knowledge management and the concept of the learning organisation, but what is meant by the concept learning organisation? In order to investigate this concept further, the researcher included a discussion of the concept in the next chapter.