

2 Knowledge and knowledge management

2.1 Introduction

Knowledge and knowledge management have become a significant focus of attention over the last ten to fifteen years. As has been noted: “the broad range of knowledge management-related articles, papers, books, authors, disciplines, conferences and lately, training is evidence that knowledge management is a discipline which needs to be considered in any modern business strategy and planning,” (Binney, 2001:33). Examples of Binney’s observation can be found in the influential books written by Davenport and Prusak (1998), Drucker (1993), Leonard (1995), Nonaka and Takeuchi (1995); Quinn (1992), Senge (1990), Stewart (1997), etc. As Davenport and Glaser (2002) have pointed out, knowledge management seemed to be riding the crest of a wave in the mid-to-late 1990s. Despite this wide coverage, however, there is no final agreement as to what the terms ‘knowledge’ and ‘knowledge management’ really mean¹.

Since an understanding of the nature of knowledge and knowledge management is important for this project, as it (along with two other dimensions, ‘stories and story telling’ and ‘world-class performance’) will provide the context for the research, this chapter will explore that nature.

2.2 What is knowledge?

2.2.1 Knowledge definition

Many different definitions of knowledge exist. In the broadest sense ‘knowledge’, as defined by Merriam-Webster’s Collegiate Dictionary (2002), is

¹ “There is no single agreed definition of knowledge. Any definition is controversial,” (BSI, 2003b:16). This is also true of knowledge management, as will be seen in section 2.3.

- The fact or condition of knowing something with familiarity gained through experience or association
- Acquaintance with or understanding of a science, art, or technique
- The fact or condition of being aware of something
- The range of one's information or understanding
- The circumstance or condition of apprehending truth or fact through reasoning
- The sum of what is known
- Facts or ideas acquired by study, investigation, observation, or experience.

More narrowly, it is also worth considering a number of definitions of knowledge that can be found in the management literature (shown in table 2.1).

“Knowledge is the capacity to act” (Sveiby, 1997:37)
“Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents and repositories but also in organisational routines, processes, practices and norms” (Davenport and Prusak, 1998:5)
“Knowledge is information in action” (Elliott and O’Dell, 1999:34)
“Knowledge is the capacity for effective action” (Senge, 1999:7)
“Knowledge is commonly distinguished from data and information...knowledge is that which we come to believe and value on the basis of the meaningfully organised accumulation of information through experience, communication or inference” (Zack, 1999b:46)
“Knowledge is information transformed in understanding and into capability for effective action; the ability to act; a set of models that describe various properties and behaviours within a domain; the insights, understanding and practical know-how that we all possess” (European KM Forum, 2002:online)
“Knowledge is information in context to produce an actionable understanding” (Rumizen, 2002:288)
“Knowledge is a set of data and information and a combination of, for example,

know-how, experience, emotion, beliefs, values, ideas, intuition, curiosity, motivation, learning styles, attitude, ability to trust, ability to deal with complexity, ability to synthesise, openness, networking skills, communication skills, attitude to risk and entrepreneurial spirit to result in a valuable asset which can be used to improve the capacity to act and support decision-making” (CEN, 2004:online)

Table 2.1 Knowledge definitions

These examples are representative of the views to be found in knowledge management literature as to the definition of knowledge. One of the common themes appearing in the literature, through several of the definitions given in Table 2.1, is the extent to which knowledge is related to action, that it provides ‘the capacity to act’ (CEN, 2004; Elliott and O’Dell, 1999; Rumizen, 2002; Senge, 1999; Sveiby, 1997). This theme provides the definition of knowledge for the purposes of this research project.

These definitions also provide a starting point for the discussion of three particular aspects of knowledge. In the first place, there is the distinction between data, information and knowledge. This distinction suggests that knowledge is somehow more than data or information and that knowledge relies upon the existence of data and information (Davis and Botkin, 1994; Drucker, 1988; Grover and Davenport, 2001; Zack, 1999b). Data (raw facts and figures), information (data that has been subjected to some treatment or interpretation) and knowledge (data and information combined with the personal contribution of the knower), form what is sometimes described as a data/information/knowledge hierarchy (drawn as a pyramid, with data the base of the pyramid, knowledge at the peak and information in between). If the pyramid is considered as a continuum, then there is a sense of transformation that takes place in the movement between each of the three elements. Data and information can be separated from the individual, but knowledge (in the strictest sense) cannot. The focus in this research project is on knowledge as opposed to data or information.

The second particular aspect of the definition of knowledge is the extent to which knowledge can be separated from the individual (made explicit, such as in definition

from Davenport and Prusak (1998), where such explicit knowledge may be represented in the number of ways), as opposed to resting in the individual (remaining tacit or implicit, not made external to the individual). Grover and Davenport (2001:7) discussed tacit versus explicit knowledge and stated that the idea of two types of knowledge can be traced back to Polanyi: “tacit knowledge, which is embedded in the human brain and cannot be expressed easily, and explicit knowledge, which can be easily codified. Both types of knowledge are important.” Other authors also trace the definition of the tacit/explicit dimensions to Polanyi (Rumizen, 2002; Zack, 1999b). Zack stated that, “tacit knowledge is subconsciously understood and applied, and usually shared through highly interactive conversation, storytelling and shared experience.” In contrast, “explicit knowledge is more precisely and formally articulated, although removed from the original context of creation or use,” (Zack, 1999b:46). Explicit knowledge represents, “the things we know that we can write down, share with others, and put into a database,” (Rumizen, 2002:287) whereas tacit knowledge is, “what we do not know that we know. It includes know-how, rules of thumb, experience, insights, and intuition,” (Rumizen, 2002:291). Further support for the distinction between explicit and tacit knowledge is found in the statement that explicit knowledge is, “knowledge that has been communicated or documented and is therefore available for use independently of the original knowledge creator,” (BSI, 2003b:11) whereas tacit knowledge is, “personal knowledge resident within the mind, understanding, perception and know-how of individuals...[and is] typically shared through discussion, stories, and allegories, and person-to-person interaction,” (BSI, 2003b:29). This distinction between tacit and explicit knowledge provides an important element of the analytical framework to be used in this research project.

The third aspect of knowledge which needs to be understood in the context of this research is the extent to which knowledge is individual (held by one person) or collective (held by one or more groups of people, or by an organisation as a whole). This distinction between individual and collective knowledge has been recognised (CEN, 2004; European KM Forum, 2002) as a potential contributor to the extent to which knowledge can be shared. Individual knowledge is much more difficult to share as it must be in some way made external to the individual, even in circumstances where the individual may be unaware that such knowledge exists. Collective knowledge, which is explicit, can be much more easily captured: “typically in objects,

words and numbers, in the form of graphics, drawings, specifications, manuals, procedures etc and can therefore be easily shared and understood,” (European KM Forum, 2002:online). This explicit knowledge may be represented in a number of different ways (Davenport and Prusak, 1998; Demarest, 1997) such as in products and services, business practices and processes and the environment and culture of an organisation.

2.2.2 Knowledge as a resource

The last fifty years has seen the arrival of a new societal era which has been given a number of names, such as the ‘post-industrial era’, ‘information age’ and ‘knowledge society’ (Bell, 1973; Drucker, 1988; Gold, Malhotra and Segars, 2001; Senge, 1998; Toffler, 1990). One of the landmarks of this new era has been the emergence of the recognition of a new management resource: knowledge. Knowledge has a significant role to play alongside the other traditional resources for organisations: men, money, machinery, and materials. Despite this growth in interest in knowledge as a resource, the need to focus on traditional resources at management disposal has not changed, although the emphasis has. Where once labour or human capital was seen from the view that people were required for their physical capacity, the approach now must include the intellectual capacity of those individuals as well. As the nature of work reflects the move away from the agrarian and extractive activities of the agricultural age and the manufacturing and industrial activities of the industrial age, to the innovative and service activities of the new knowledge or information age, so the need to better understand knowledge as a resource will continue to increase.

Davis and Botkin (1994) were among the first to identify that knowledge can be used as a key resource, also where the effective use of knowledge has the capability to take the organisation to new, higher levels of performance. They reinforced the case for knowledge as a key management resource when they asserted: “the next wave of economic growth is going to come from knowledge-based businesses,” (1994:165). Another example of this focus on knowledge as a resource in organisations came from Prusak (cited in Cohen, 1998:23) who also stated that, “there is an emerging new theory of the firm, one that recognises the growing complexities of work, products

and organisations,” concluding that, “the only sustainable competitive advantage comes from what you know and how fast you can put it to use.” Clearly, this is a reference to the way in which knowledge can be used as a resource. Drucker (cited in Ruggles, 1998:80) also stated that, “knowledge has become the key economic resource and the dominant – and perhaps even the only – source of comparative [sic] advantage.” Similar recognition of the importance of knowledge as a resource came from Zack (1999a) who looked at the importance of the role of knowledge and the resource-based theory of the firm, where knowledge provides a powerful capability for the organisation and one that is difficult for others to replicate: “knowledge can be considered the most important strategic resource,” (Zack, 1999a:128). Earl (2001:231) agreed when he said that “to those who believe in resource-based theories of the firm...knowledge tends to be firm-specific and can be difficult to imitate.” There is a marked similarity in the views expressed by these authors: knowledge should be seen as a resource, and potentially the key resource, in determining the success of organisations in the future. The implication of this is that knowledge needs to be managed. This idea will be explored in the next section.

2.3 What is knowledge management?

2.3.1 Knowledge management definition

At much the same time (from the mid-1990s onwards) as the focus on knowledge as a resource in organisations received growing attention so did the issue of how to manage that knowledge, giving rise to the knowledge management movement, as highlighted by Binney (2001) and Prusak (2001).

As was the case with the definition of knowledge, there is no single, commonly agreed, definition for knowledge management (Haggie and Kingston, 2003; Paulzen and Perc, 2002). Just as knowledge is multi-faceted, complex and ever changing, so is knowledge management. Despite this lack of agreement, or perhaps rather because of it, it is important in the context of this research project to explore the meaning of

knowledge management. Table 2.2 offers just some of the possible definitions of knowledge management drawn from the literature between 1998 and 2004.

“[Knowledge management] is an approach to adding or creating value by more actively leveraging the know-how, experience, and judgment resident within and, in many cases, outside of an organisation” (Ruggles, 1998:80)
“Knowledge management is the strategies and methods of identifying, capturing and leveraging knowledge to help a firm compete” (O’Dell, Wiig and Odem, 1999:203)
“Knowledge management is a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge” (SAI, 2001:7)
“[Knowledge management is] an approach to improving an organisation's capabilities through better use of the organisation's individual and collective knowledge resources. Knowledge management is a discipline that uses technology to share and leverage information for innovation” (European KM Forum, 2002:online)
“[Knowledge management is] the broad process of locating, organising, transferring and using the information and expertise within an organisation” (European KM Forum, 2002:online)
“[Knowledge management is] managerial activities that focus on the development and control of knowledge in an organisation to fulfil organisational objectives” (European KM Forum, 2002:online)
“[Knowledge management is] the strategies and processes of identifying, capturing and leveraging knowledge to enhance competitiveness” (European KM Forum, 2002:online)
“[Knowledge management is] how an organisation identifies, creates, captures, acquires, shares, and leverages knowledge” (Rumizen, 2002:288)
“Knowledge management is the creation and subsequent management of an environment which encourages knowledge to be created, shared, learnt, enhanced, organised and utilised for the benefit of the organisation and its customers” (BSI, 2003b:19)
“Knowledge management: planned and ongoing management of activities and processes for leveraging knowledge to enhance competitiveness through better use and creation of individual and collective knowledge resources” (CEN, 2004:online)

Table 2.2 Knowledge management definitions²

It is interesting to note that in the case of the European KM Forum, not one but several definitions are offered, indicating something of the complexity and difficulty of settling on a single definition. Some of the definitions of knowledge management are more focused on the objectives (goals) of using knowledge (such as ‘creating value’ (Ruggles, 1998) and ‘to achieve organisational objectives’ (SAI (2001)), as opposed to a process approach (BSI, 2003b; Rumizen, 2002).

² This table is presented in chronological sequence.

Although Ruggles (1998) sees knowledge management as ‘an approach’, there are in fact many different possible approaches, as highlighted by Earl (2001) when he classified seven different schools of knowledge management, each of which represents a valid alternative way of seeing and undertaking a knowledge management initiative. This issue will be further explored in section 2.3.4.

The concept of leveraging or making best use of knowledge is common to the definition offered by CEN (2004), European KM Forum (2002), Rumizen (2002) and SAI (2001). This suggests that there must be planned, deliberate action taken on the part of the organisation to achieve the potential that exists in the use of knowledge through knowledge management.

Looking in more detail at the table of definitions, and in particular those put forward by the European KM Forum (2002), the first draws the distinction between individual and collective knowledge, specifically mentioning knowledge as a resource. It is also the only definition that makes any mention of the role of technology. The second takes a much more process-oriented approach, and so is similar to the emphasis from Rumizen (2002). The third European KM Forum (2002) definition includes the use of the word ‘control’ which is not found in any of the other definitions offered and therefore is somewhat of an anomaly, whereas the last of the European KM Forum (2002) definitions is almost identical to that from O’Dell *et al.* (1999), merely substituting the word ‘processes’ for ‘methods’.

The Rumizen (2002) definition is highly process-oriented, which whilst being similar to the definition from BSI (2003b) and the first of the European KM Forum (2002) definitions (having many of the same elements) does not specifically address the issue of ‘creating an environment’ in which knowledge can be created and shared. The final definition listed in Table 2.2 (CEN, 2004) again highlights the importance of including individual and collective knowledge when considering the true meaning of knowledge management.

Having considered the definitions contained in Table 2.2, for the purposes of this research project, none of the definitions was found to be worthy of disregarding nor does any single definition suggest precedence over any other. Therefore, the following

definition will be used: ‘knowledge management is a deliberate attempt on the part of an organisation to share what it knows and to create new knowledge’.

As the management of knowledge is a significant element in the process of achieving the objectives of the organisation, there should, in turn, be objectives for knowledge management. This aspect is addressed in the next section.

2.3.2 Knowledge management objectives

Organisations do not all have the same objectives. One can expect to find significant differences, for example, in the objectives of governments, non-governmental organisations, and commercial entities (for-profit organisations) based on the nature of their activities and the interests of their stakeholders. In addition, depending upon the position of the organisation in its life cycle, the objectives may be geared more towards survival (for a start-up), growth (either in terms of market share, profitability or some other measure), or return to stakeholders (including but not limited to the profit motive). If knowledge and knowledge management are to contribute towards the achievement of the organisation’s objectives, then it becomes important to understand what those objectives for knowledge management might be. Table 2.3 presents the results of research into approximately 600 knowledge management projects that have been reported in the literature³.

³ The columns in this table are presented for general comparison. There is no intention to indicate that each row in the table is directly comparable.

Davenport, De Long and Beers (1998) surveyed 31 knowledge projects	Ruggles (1998) surveyed 430 knowledge projects	Prusak (in Cohen, 1998) surveyed 100 knowledge projects	McKeen and Staples (2001) surveyed 41 knowledge projects⁴
Create knowledge repositories	Create knowledge repositories	To build a knowledge infrastructure...a web of connections among people	Create knowledge repositories
Improve knowledge access (including the use of yellow pages)	Creating intranets	To make knowledge visible and show the role of knowledge in organisations, mainly through maps, yellow pages, hypertext tools	Creating intranets
Enhance knowledge environment ⁵	Implementing decision support tools	To develop a knowledge-intensive culture	Implementing decision support tools
Manage knowledge as an asset	Implementing groupware to support collaboration		Implementing groupware to support collaboration

Table 2.3 Objectives for knowledge management initiatives

What becomes apparent when evaluating the results of the research reported in Table 2.3 is that there are distinct similarities in terms of the objectives of the knowledge projects surveyed. The biggest similarity is the common interest in many of these projects in creating knowledge repositories (capturing and making available explicit knowledge either to groups within the organisation or to the organisation as a whole). The second common objective across the projects surveyed is increasing access to those individuals with knowledge (through such means as yellow pages/directories and intranets), emphasising the role that technology has to play in knowledge management implementations. The third factor mentioned by more than one author is

⁴ The similarity in the findings from McKeen and Staples (2001) and Ruggles (1998) is that the latter study was designed as an update to the former study.

⁵ To create and support an environment in which knowledge is created and shared.

the extent to which knowledge management is a cultural issue, where the creating and nurturing of an environment that encourages knowledge to flow and be created is recognised as being a specific objective. A fourth common factor is the relatively small number of objectives highlighted by the authors for the knowledge projects undertaken.

Having identified some of the common objectives for knowledge management initiatives it becomes relevant to investigate the possible success factors associated with knowledge management.

2.3.3 Knowledge management success factors

A number of authors have reported on the success factors⁶ associated with knowledge management initiatives (Cohen, 1998; Davenport and Prusak, 1999; Davenport *et al.*, 1998; Demarest, 1997; Denning, 2004c; Earl, 2001; Elliott and O'Dell, 1999; Gartner cited in Snyman and Kruger, 2004; Hiebeler, 1996; Nonaka, 1994; Pommier, undated; Skyrme, 2000; Von Krogh, Ichijo, Nonaka, 2000).

Table 2.4 presents five of those sources where specific use of the term 'success factor' is made in describing the elements that contribute to a knowledge management strategy⁷.

⁶ These authors used a number of terms such as 'key elements' or 'pre-requisites' or 'building blocks' as well as 'success factors'.

⁷ The columns in this table are presented for general comparison. There is no intention to indicate that each row in the table is directly comparable.

Hiebeler (1996)	Davenport <i>et al.</i>, (1998)	Skyrme (2000)	Pommier (undated) and Denning (2004c)	Gartner (Snyman and Kruger, 2004)
Taking a long-term view of the benefits of a knowledge management strategy	Link to economic performance or industry value	Strong link to a business imperative	Defining a knowledge strategy	Linked to the strategic direction of the organisation
Integrating knowledge management into the culture	Technical and organisational infrastructure	A knowledge creating and sharing culture	Nurturing communities of practice	Requires an organisational culture and discipline that promotes and supports knowledge sharing, collaboration, innovation.
Making and communicating a commitment to knowledge sharing	Standard, flexible knowledge structures	Knowledge leadership	Choosing technologies that help sharing knowledge	Must be enabled by robust business and human processes
Developing a framework for capturing knowledge	Clear purpose and language	Continuous learning	Organising knowledge management	Depends on a compelling technology environment to automate the processes
Making information systems accessible and easy to use	Change in motivational practices	Well-developed information and communications infrastructure	Introducing new personnel incentives	Requires an extended-enterprise scale and scope of processes, people and content
Creating, capturing, and transferring knowledge internally	Multiple channels for knowledge transfer	Systematic knowledge processes	Providing a budget for knowledge sharing	
Allocating	Senior	A compelling	Communicating	

time and resources for knowledge sharing	management support	vision and architecture	the values of knowledge sharing	
Finding financial and non-financial ways to measure the benefits of knowledge management	Knowledge-friendly culture		Measuring performance	

Table 2.4 Knowledge management success factors

The number of success factors varies from five (the least) to eight (the most), indicating that a relatively small number of success factors should be the focus of attention for an organisation seeking to be successful in its knowledge management activities.

In analysing the entries in Table 2.4 it can be seen at once that there is a remarkable degree of similarity between the various success factors identified: the focus on the role of knowledge management strategy, leadership, culture, infrastructure, processes and measurement (although this last factor is only mentioned by two of the authors). These six factors can be used in the context of this research project as a further element of the analytical framework for the review of the case study organisation.

Which of the six factors are the most relevant in an organisation undertaking a knowledge management strategy will depend in part not only on the objectives which have been set (for the organisation as a whole and for knowledge management specifically), but also the overall approach (philosophy, model, framework or school of thought) for knowledge management within the organisation.

2.3.4 Knowledge management models and frameworks

It has been identified that there are no unique, generally agreed definitions for knowledge or knowledge management. Perhaps given the relative immaturity of the knowledge management field it should not be surprising then that there is also no single, generally recognised and accepted model or framework for the implementation of knowledge management. However, several attempts have been made to categorise the models, frameworks and approaches to knowledge management that exist (Binney, 2001; Earl, 2001; McAdam and McCreedy, 1999).

McAdam and McCreedy (1999) identified a number of knowledge management models that they classified into three categories:

- Knowledge category models. These types of models categorise knowledge into discrete elements, such as tacit and explicit knowledge elements. An example of this model type according to McAdam and McCreedy (1999) would be the ‘Socialisation, Externalisation, Combination, Internalisation’ (SECI) model from Nonaka and Takeuchi (1995).
- Intellectual capital models. These models assume intellectual capital can be segregated into human, customer, process and growth elements. An example given by McAdam and McCreedy (1999) would be the Skandia model (Chase, 1997).
- Socially constructed models. These models assume a wide definition of knowledge and views knowledge as being intrinsically linked with the social and learning processes within the organisation. An example would be the ‘learn before/during/after’ model as used at British Petroleum (McAdam and McCreedy, 1999).

Binney (2001) took a somewhat different approach in his analysis of knowledge management models and proposed his ‘Knowledge Management Spectrum’ as a framework that covers a wide range of knowledge management applications (he identified thirty nine applications in total). He grouped these into a framework that consisted of six elements:

- Transactional knowledge management: knowledge is provided to the user through interaction with the system
- Analytical knowledge management: large amounts of data or information are used to derive trends and patterns which if acted upon can become knowledge
- Knowledge asset management: includes explicit knowledge assets and intellectual property
- Process based knowledge management: focuses on the improvement of processes, work practices, procedures or methodology
- Developmental knowledge management: focuses on increasing the competencies or capabilities of the knowledge workers
- Innovation/creation knowledge management: focuses on providing an environment in which knowledge workers can collaborate to create new knowledge (Binney, 2001).

Binney's (2001) analysis is much more of a conceptual framework for understanding the various elements of knowledge management than a specific model of how knowledge management works in an organisation. In that sense, his analysis is similar to that of Earl (2001) who organised a number of models of knowledge management into 'schools'. Earl (2001) looked at several attributes of each school identified in his framework (focus; aim; unit; example; critical success factors; principle information technology contribution; philosophy), and defined a total of seven schools of knowledge management which he organised into three groups.

The first group consisted of three schools and was classified as being *technocratic*: systems (largely based on the use of technology), cartographic (based on the concept of mapping knowledge), and engineering (based on the principles of engineering business and management processes). The fourth school, economic, was identified as *commercial* (based on the firm's knowledge asset management). The remaining three schools were identified as *behavioural*. These schools were organisational (based on the use of networks or structures), spatial (based on the use of space to facilitate knowledge exchange), and strategic (where knowledge is an element of competitive strategy). Earl proposed that the seven schools suggest that knowledge management

can not only be defined in different ways, but that, “there is considerable choice in both what to do and how to do it,” (Earl, 2001:232).

Each of these three attempts to categorise the overall framework or approach to knowledge management (Binney, 2001; Earl, 2001; McAdam and McCreedy, 1999) is relatively comprehensive, but leaves it up to the practitioner to choose between the various alternatives presented, rather than being prescriptive as to which specific approach or model should be applied in a particular situation. This is useful for an organisation embarking on the ‘knowledge management journey’ but is not specific enough to be of great value in the case of this research project.

Apart from the overall frameworks as discussed already in this section, a number of other individual models or frameworks have been identified in the literature: the codification/personalisation model (Hansen, Nohria, and Tierney, 1999); the American Productivity and Quality Centre (APQC) model (O’Dell *et al.*, 1999); the key infrastructure model (Gold *et al.*, 2001); the learn before/during/after model⁸ (Collison and Parcell, 2001); the intangible asset model (Sveiby, 2001); the European KM Forum Knowledge Management framework (European KM Forum, 2002). These six models/frameworks are discussed here.

Hansen *et al.* (1999), in their model, highlight the difference between knowledge codification and personalisation. In this model, codification was focused on the creation of knowledge repositories, whereas personalisation related to direct interaction of people and through networks in achieving their knowledge management objectives. They specifically looked at how consulting firms manage their knowledge and used comparisons based on the firms’ competitive strategies, economic models, knowledge management strategies, information technologies and human resources. The authors observed that firms tended to use one of the two approaches (codification or personalisation) as their dominant approach, whilst using the alternative as a supporting approach (typically on a Pareto-like 80:20 basis)⁹.

⁸ Already mentioned as an example, it will be more fully discussed here.

⁹ Examples included Ernst and Young for codification and Bain and Company for personalisation (Hansen *et al.*, 1999).

The APQC and Arthur Andersen developed a knowledge management framework in the mid-1990s (O'Dell *et al.*, 1999). The model had four 'knowledge management enabler' elements (strategy and leadership; culture; technology; measurement) and seven knowledge management processes (these are listed in Table 2.5). This framework was intended to be used by those taking part in a benchmarking study into knowledge management best practice as a context for thinking about knowledge management, and has since been used as the basis for the implementation approach recommended by the APQC (APQC, 2000).

Gold *et al.*, (2001) presented a knowledge management model with three key elements: technical (technology-enabled ties within the firm), structural (norms and trust mechanisms), and cultural (shared contexts) which would enable the maximisation of social capital through the ability to store, transform and transport (share or transfer) knowledge. This model combined knowledge infrastructure capability with knowledge process capability to give organisational effectiveness, and included a series of measures for each element of the model.

Collison and Parcell (2001) reported British Petroleum's (BP) own model of knowledge management, emphasising learning before, learning during and learning after specific engagements (often structured as projects) where knowledge could be brought to bear to improve organisational performance. Collison and Parcell (2001) also referenced the building blocks of people, process and technology as part of a commonly used model of knowledge management (without quoting a specific reference as a source), and explained what they saw as their unique developments at BP (such as knowledge sharing methods which they developed).

Sveiby (2001) presented a knowledge management model that emphasised a *knowledge-based theory of the firm* and was presented as an alternative to a traditional product/market-based view (Sveiby used Porter (1980) as an example of this traditional view). In Sveiby's model there were three families of intangible assets: the external structure; the internal structure and individual competence. Sveiby's focus was on the transfers that take place between the elements of his model.

The European KM Forum (2002) knowledge management framework was developed as a joint effort between a group of European-based stakeholders and consisted of the following elements:

- Knowledge management strategies
- Human and social knowledge management issues
- Knowledge management organisation
- Knowledge management processes
- Knowledge management technologies
- Leadership
- Knowledge management performance measurement
- Knowledge management business cases and implementation (European KM Forum, 2002).

This framework presented an opportunity to implement knowledge management successfully but without exploring the underlying theoretical principles on which knowledge management is based.

Each of the six models or frameworks just presented has its own attractions and yet none really offers a fundamental understanding of the nature of how knowledge is shared and created in an organisation at the level of the individual, teams and the organisation as a whole. To gain this understanding, it is necessary to explore one of the most widely quoted and recognised models of knowledge management: the SECI model¹⁰ (Nonaka, 1991; Nonaka and Takeuchi, 1995). This model goes a long way to providing an understanding of how knowledge sharing and creation works in practice, taking into account the differences between tacit/explicit and individual/collective knowledge identified in section 2.2.1. Nonaka and Takeuchi (1995) pointed out that in the SECI model (a simplified version of which appears in Figure 2.1) the spiral of knowledge creation carries from individual to group to organisation/inter-organisation.

¹⁰ Already mentioned in this section as an example given by McAdam and McCreedy (1999) within their overall model framework.

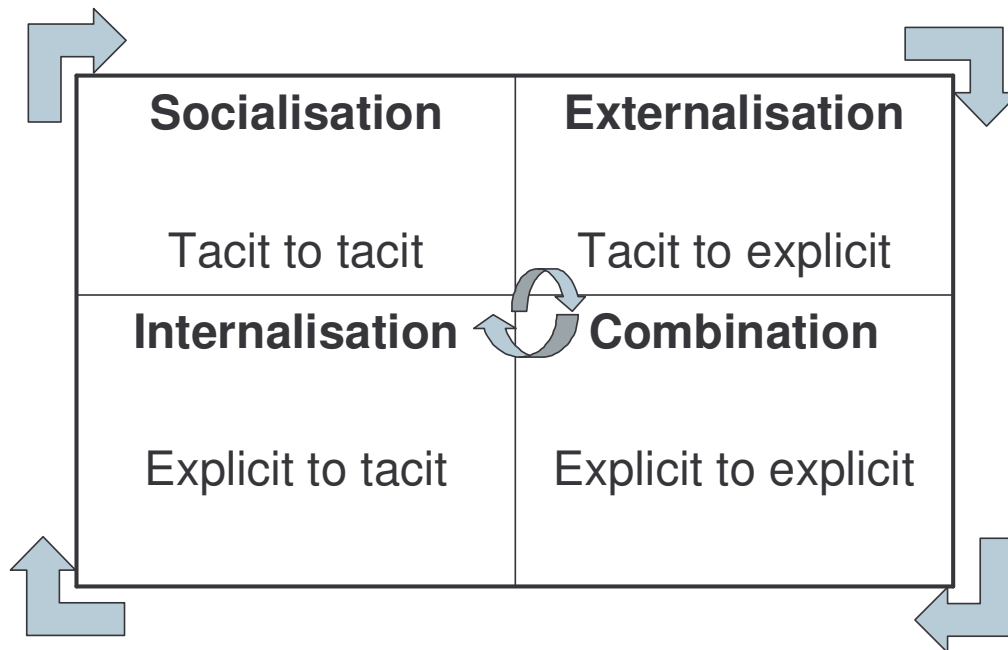


Figure 2.1 SECI Model
 (Source: Nonaka and Takeuchi, 1995)

Later Nonaka and Konno (1998) took the model somewhat further. They identified two dimensions of tacit knowledge: the technical dimension, comprising informal personal skills or crafts or know-how; and the cognitive dimension: beliefs, ideals, values, mental models. They drew attention to the fact that the cognitive element is very difficult to articulate but shapes the way we see the world. Nonaka and Konno (1998) then drew a parallel between the SECI model and four types of Ba¹¹ (originating, interacting, cyber, exercising). They quoted examples of the use of Ba, emphasising the living nature of knowledge, where knowledge is seen more as a flow than a stock.

Each element of the SECI model will be explored in more detail following the approach of Nonaka and Konno (1998).

¹¹ “Ba can be thought of as a shared space for emerging relationships space can be physical, virtual or mental or combination of all three. Ba is considered a shared space that serves for knowledge creation,” Nonaka and Konno (1998:41).

Firstly, socialisation involves the sharing of tacit knowledge between individuals (more so than at the group or organisation level). This might happen through such activities as spending time and working together or living in the same environment, all of which revolve around physical proximity. Two other elements included in socialisation are the direct interaction with suppliers and customers, as well as the physical activity of walking around inside the business. In essence, this is a 1-on-1 form of knowledge sharing.

Secondly, externalisation is supported by two key factors. The first of these factors, the articulation of tacit knowledge (or the conversion of tacit into explicit knowledge), could involve techniques that help to express one's ideas (including metaphors, analogies, or narratives, and visuals). This can be achieved by individuals or teams (such as in a community of practice¹²) or at the level of the whole organisation. The second factor involves translating the tacit knowledge of various role players (internal and external) into readily understandable forms.

Combination involves the conversion of explicit knowledge into more complex sets of explicit knowledge. Here the key issues are communication and diffusion processes and the systemisation of knowledge. Combination relies upon three processes:

- Capturing and integrating new explicit knowledge. For example, collecting externalised knowledge (e.g. public data) from inside or outside the company and then combining such data.
- The dissemination of explicit knowledge. This is based on the process of transferring this form of knowledge directly by using presentations or meetings.
- The editing or processing of explicit knowledge to make it more usable.

The fourth element from the SECI model, internalisation, relies upon two dimensions. In the first of these, the process of internalising the explicit knowledge actualises concepts or methods about strategy, tactics, innovation, or improvement. In the

¹² This concept will be discussed further in section 2.3.7.

second, there is a process of embodying the explicit knowledge by using simulations or experiments to trigger learning by doing processes.

The SECI model was selected as the model of knowledge management that best fitted the nature of the research problem, as it would allow an analysis based on the elements of tacit and explicit knowledge as well as individual and collective knowledge. The analysis could, therefore, be achieved without the pre-requisite of finding an organisation that had already decided to follow one of the other, more specific models or frameworks outlined earlier in this section. In other words, the generic nature of the SECI model (its ability to be applied in a wide range of organisational settings, at the level of individuals, teams and the whole organisation) made it an appropriate choice in the situation where the environment at the case study organisation could not be predicted in advance of the research project being undertaken.

Having selected a specific reference model (in this case the SECI model) it is important to gain a clearer understanding of the broad range of possible processes that can be applied where knowledge management activities are undertaken.

2.3.5 Knowledge management processes and sub-processes

Given the lack of conclusive agreement about a single definition of knowledge and knowledge management, and the many different models of knowledge management, it should be expected that there should be a range of opinions as to the processes that constitute knowledge management. Table 2.5 represents (in alphabetical sequence by source) some of the contributions to the debate about which processes and sub-processes comprise knowledge management:

Source	Process or sub-process elements identified
Birkinshaw and Sheehan (2002)	<ul style="list-style-type: none"> • Creation; mobilisation; diffusion; commoditisation
Cohen (1998)	<ul style="list-style-type: none"> • Collecting; distributing; re-using; measuring
Collison and Parcell (2001)	<ul style="list-style-type: none"> • Learn before; learn during; learn after
Cross and Baird (2000)	<ul style="list-style-type: none"> • Target where learning needs to take place • Provide a structure that encourages individuals and groups to share what they have learned from their experiences • Build organisational memory
Davenport, Thomas and Cantrell (2002)	<ul style="list-style-type: none"> • Analytic process and the decision-making process
Davenport, Jarvenpaa and Beers (1996)	<ul style="list-style-type: none"> • Acquisition; creation; packaging; application; reuse
Demarest (1997)	<ul style="list-style-type: none"> • Construction; embodiment; dissemination; use
Despres and Chauvel (1999)	<ul style="list-style-type: none"> • Map; acquire/capture/create; package; store; apply/share/transfer; innovate/evolve/transform
European KM Forum (2002)	<ul style="list-style-type: none"> • Identifying, locating, capturing, sharing, leveraging, organising, storing, transferring, retrieving
Gold <i>et al.</i> (2001)	<ul style="list-style-type: none"> • Acquiring, convert, apply, protect
Grant (1996)	<ul style="list-style-type: none"> • Efficiency of integration; scope of integration; flexibility of integration
Grover and Davenport (2001)	<ul style="list-style-type: none"> • Generation; codification; transfer/realisation
Leonard (1995)	<ul style="list-style-type: none"> • Acquire; collaborate; integrate; experiment
Nonaka and Takeuchi (1995)	<ul style="list-style-type: none"> • Socialisation; externalisation; internalisation; combination
O'Dell and Grayson (1998)	<ul style="list-style-type: none"> • Create; identify; collect; organise; share; adapt; use
Paulzen and Perc (2002)	<ul style="list-style-type: none"> • Identify; generate; use; store; distribute; evaluate
Ruggles (1998)	<ul style="list-style-type: none"> • Generating; accessing; using; embedding; representing; facilitating; transferring; measuring
Skyrme and Amidon (1998)	<ul style="list-style-type: none"> • Create; transfer; use
SAI (Standards Australia International) (2001)	<ul style="list-style-type: none"> • Sharing; acquisition; creation
Sveiby (2001)	<ul style="list-style-type: none"> • Knowledge transfer (between individuals and internal and external structures)
Teece (1998)	<ul style="list-style-type: none"> • Create; transfer; assemble; integrate; exploit
Von Krogh, Nonaka and Aben	<ul style="list-style-type: none"> • Creation; transfer

(2001)	
Zack (1999b)	<ul style="list-style-type: none"> • Acquisition; refinement; storage and retrieval; distribution; presentation

Table 2.5 Knowledge management processes and sub-processes listing

As the contents of Table 2.5 clearly demonstrate, there is no single set of agreed knowledge management processes. There are, however, some key themes that emerge. Taking the list of sources in Table 2.5 and reducing the terms to those with common and unique characteristics yields the following table¹³:

Acquire / gather / assemble / collect
Capture / store
Codify / map / identify
Collaborate
Combine / integrate / convert / transform / create / generate / construct / adapt / refine
Disseminate / diffuse / distribute / present / represent / facilitate
Experiment
Externalise
Innovate / evolve
Internalise / embed / learn
Measure / evaluate
Package / commoditise / organise
Protect
Reward
Share / transfer / socialise / mobilise
Use / apply / exploit / realise / reuse / access / retrieve

Table 2.6 Integrated list of processes/sub-processes

¹³ Even this attempt at de-duplication is subject to discussion, as this shorter list of sixteen processes (or process/sub-process groups) is merely yet another interpretation, this time by the author of this research project, of what processes constitute knowledge management.

Of all the processes listed in Table 2.6, the one of most interest in the context of the main problem in this research project is the knowledge sharing process¹⁴. “Knowledge sharing is a process by which knowledge is transferred within and between organisations,” (BSI, 2003b:22) and knowledge sharing occurs “when people are genuinely interested in helping one another develop new capacities for action,” (Senge, 1999:6).

It would be useful for the analysis to be conducted in this research to have a clearer definition of the types of sharing that can take place and Dixon’s (2000) four types of knowledge sharing (transfer) sub-process definitions have been adopted for this research:

- Serial sharing: where the same team in a new context repeats a task.
- Near sharing: where knowledge moves from a source team to a receiving team on a similar task in a similar context in a different location.
- Far sharing: where knowledge moves from a source team to a receiving team about a non-routine task.
- Strategic sharing: where very complex knowledge is shared and the teams are separated by time and space.

Sharing knowledge can take place through the use of a number of different practices and tools (Allee, 1997; Bouthillier and Shearer, 2002; Davel and Snyman, 2005). The choice of which practices and tools to use as enablers to knowledge management will be further explored in section 2.3.7.

Sharing knowledge is not necessarily easy and a number of barriers to sharing have been identified: cultural factors; the reward system; management leadership; ignorance; absorptive capacity; lack of a sharing relationship; lack of an effective, co-ordinated and coherent strategy to share (O’Dell and Grayson, 1998, 2004; Sveiby, 2001; Szulanski, 1996).

¹⁴ For the purposes of this research the term ‘share’ is taken to include the related term ‘transfer’.

In summary, there are many different and overlapping definitions of the processes involved in knowledge management. Of all these processes, the one of most interest for this research is knowledge sharing. Sharing can be achieved at the level of the individual, group, or organisation. There are many different possible practices and tools to assist in knowledge sharing. Sharing is not necessarily easy and requires a number of barriers to be overcome.

The next section will look at the roles required to implement knowledge management effectively.

2.3.6 Knowledge management roles

The roles within knowledge management, including those of the knowledge workers themselves as well as the specialist roles involved in making knowledge management happen, have received significant attention in the literature (Davenport *et al.*, 1996; Drucker, 1988, 2000; Earl and Scott, 1999; Leonard, 1995; Malhotra, 2002; O'Dell, 2002; TFPL¹⁵, 1999, 2003; Zack, 1999b) and are the focus of this section.

The importance of the knowledge worker has been recognised for some time (Drucker, 1988). He also highlighted the productivity of knowledge workers as the great management task of the 20th century, just as making manual work productive had been the great management task of the previous century. Drucker referred to this theme of the management of knowledge workers (without specifically offering a definition of a knowledge worker) when he stated that the most valuable asset of a 21st century institution “will be its knowledge workers and their productivity,” (Drucker, 2000:79). Leonard (1995) used the example of Chaparral Steel, to define a knowledge worker. In the definition, she included manual workers as well as non-manual workers in the organisation. This is in contrast to Davenport *et al.* (1996:57) who saw knowledge work as being, “performed by professional or technical workers

¹⁵ The company only uses initials for its name on its web site and in all publications.

with a high level of skill or expertise”¹⁶. For the purposes of this research, the broader definition of all employees as knowledge workers is used.

If it is accepted that knowledge workers may be found widely distributed across the organisation, there may still be a requirement for specialist knowledge roles to be defined in order to complete the successful implementation of a knowledge management initiative. O’Dell (2002), for example, identified three critical roles in knowledge management implementation: knowledge stewards (who collect, analyse, and organise knowledge); knowledge facilitators (who establish connections between individuals in order to share knowledge); and community of practice¹⁷ leaders (who set the direction and climate for knowledge sharing in their communities). In addition, organisations need a strategic support/steering group as well as a central knowledge management support team: “there need to be some common processes and principles and tools, and the central group can help make that happen,” (O’Dell, 2002: online).

Some of the most comprehensive work on roles for knowledge management has been published by TFPL (1999, 2003). In their briefing paper, TFPL (1999) identified a number of key attributes for knowledge management roles:

- Knowledge management roles may be undertaken on a full-time, part-time or additional-duty basis
- Knowledge management roles may be filled by people recruited either from inside or outside the organisation
- Knowledge management roles may be described at a high level with commonality across most organisations even if there are differences in the details.

What is revealing about their research is that although there may be a potential multiplicity of knowledge management position titles, the underlying knowledge management roles are much more common. Under the banner of *knowledge*

¹⁶ This distinction was also not important to TFPL (2003) where their classification included team members as one of their knowledge roles, regardless of the type of work they might be engaged in.

¹⁷ This term will be explained in section 2.3.7.

management practitioners TFPL (1999)¹⁸ listed among others the following roles: knowledge leaders, managers, navigators, synthesisers, editors, publishers, coaches, and mentors. Later these roles were re-defined as belonging to one of three levels of knowledge management roles (strategic leader; team leader; team member) as well as defining a role for everyone working in an organisation that is sharing knowledge (TFPL, 2003). This is similar to the view of Leonard (1995) that all employees are knowledge workers.

One of the most important roles in implementing knowledge management is that of the person driving the initiative. This role, although still in its infancy, often goes under the title of Chief Knowledge Officer (CKO). Earl and Scott (1999), Malhotra (2002) and Zack (1999b) all discussed the role of the CKO in managing knowledge management initiatives, where the CKO fulfils the 'strategic leader' role identified by TFPL (2003). Earl and Scott (1999) also recognised that there are a number of possible 'homes' for the CKO, including the information technology function and Human Resources function as well as the possibility of reporting directly to the Chief Executive Officer of the organisation¹⁹.

The actual knowledge management roles defined are likely to be dependent on the nature of the knowledge management projects or processes undertaken in the business (TFPL, 2003), with varying degrees of enthusiasm on the part of the knowledge workers involved. If knowledge management is seen as an adjunct to, and not an integral part of, the way the organisation operates, the natural reaction of those asked to participate in knowledge management activities is likely to be one of reluctance where that participation is over and above their normal duties, such as participation in a knowledge community (Wenger, 2000).

In summary, there are a series of roles emerging for the knowledge management world: from the senior executive charged with the responsibility of leading the knowledge management initiative, through specific role players in the knowledge

¹⁸ Davenport, Harris, De Long and Jacobson (2001), Malhotra (2002) and Zack (1999b), also identified a number of key knowledge management roles, although not in as much detail as TFPL.

¹⁹ If, as will be discussed in the next section, knowledge management plays a genuinely strategic role in the business, the CKO role, where it exists, should be reporting at the highest level, commensurate with the importance associated with the role of knowledge management as a whole.

management function (where this exists) to the knowledge workers themselves. This understanding of the knowledge roles in the organisation will provide a further useful element of the overall analytical framework for this research.

Recognising the various knowledge management roles to be played in the organisation leads on to the next issue to be explored, which is the nature of the practices and tools to be used by the role players in pursuit of their knowledge management objectives.

2.3.7 Knowledge management practices and tools

Many different terms can and have been used to describe the way in which knowledge management activities are carried out, such as practice, method, methodology, technique, technology, and tool (Allee, 1997; Binney, 2001; Bouthillier and Shearer, 2002; Davel and Snyman, 2005; Earl, 2002; Edwards and Shaw, 2004; Faul and Camacho, 2004; Fouche and Botha, 2002; Liebowitz and Chen, 2004; Skyrme, 1998; Stewart, 2002; Wensley and Verwijk-O'Sullivan, 2000).

Some authors use these terms (practice, method, methodology, technique, technology, and tool) without specific definition. Some use them as synonyms, whilst others use them as individual/unique aspects of an overall approach to knowledge management. For example, Wensley and Verwijk-O'Sullivan (2000:115) drew a distinction between technologies, methodologies and tools. According to them, a technology "is some human construct or artefact that potentially can enhance and enable human activities"; a methodology is "a set of ways of interacting with the technology," and a tool "is one aspect of a technology that is typically used to achieve some specific purpose or related set of purposes."

For the purposes of this research the following classification will be used:

- Practice: a method, or methodology used in achieving one or more knowledge management objectives (example: knowledge sharing)

- Tool: a specific instrument or technique or technology used to achieve one or more practices (example: a database is a tool or technology used to support knowledge sharing).

In surveying the literature it was found that three authors had attempted to classify knowledge management practices into a number of categories.

The approaches of Bouthillier and Shearer (2002) and Davel and Snyman (2005) to practices classification were based on knowledge processes whereas Allee (1997) did not use a process approach. These three attempts at an overall classification of practices are complemented by additional sources that provided a broader perspective as to a total list of practices relevant to implementing knowledge management. Table 2.7 presents a consolidated list of thirty-six knowledge management practices based on the opinions of all these authors (Allee, 1997; Binney, 2001; Bouthillier and Shearer, 2002; Davel and Snyman, 2005; Earl, 2002; Edwards and Shaw, 2004; Faul and Camacho, 2004; Fouche and Botha, 2002; Liebowitz and Chen, 2004; Skyrme, 1998; Stewart, 2002; Wensley and Verwijk-O’Sullivan, 2000). This consolidated list can be used as part of the analysis activities in this research project.

After action review/ Retrospects	Exit interviews	Learning centres/meeting rooms
Benchmarking	Expert networks	Libraries
Brainstorming	Expert forums	Measurement systems
Business intelligence ²⁰	Innovation workshops	Mentoring
Centre of excellence	Internal networks of knowledge workers	Office layout
Coaching (on the job training)	Internal surveys	Peer assists
Communities of practice	Knowledge audit	Process modelling
Competitive intelligence	Knowledge conference	Scenario planning
Discussion forums	Knowledge education/training (off the job)	Stories and storytelling (oral, written, drama, combined)
Embedding knowledge into processes	Knowledge fair/exchange	Suggestion schemes
Environmental scanning	Knowledge workshops	Surveys (internal and external)
Establishing new knowledge roles	Learn before, during, after Learning by doing	

Table 2.7 Consolidated list of knowledge management practices

²⁰ Business intelligence is sourced from within the organisation; competitive intelligence is sourced externally.

These knowledge management practices may be carried out (enabled) in a number of ways, including the use of one or more tools (technology). Table 2.8 shows a consolidated list of those tools identified by a number of authors surveyed in the literature (Binney, 2001; Bouthillier and Shearer, 2002; Davel and Snyman, 2005; Edwards and Shaw, 2004; Faul and Camacho, 2004; TotalKm.com, undated; Wensley and Verwijk-O’Sullivan, 2000)²¹.

Best practices databases	Knowledge maps
Bulletin and message boards	Knowledge portals
Chat rooms (online)	Knowledge repositories
Collaboration software/tools	Mailing lists
Creativity software	Mind-mapping software
Data mining/warehousing	Navigation tools
Data analysis tools	Neural computing
Decision support systems/tools	Online communities of practice
Directory of experts ²²	Question and answer databases
Document management systems	Radio
Electronic whiteboards	Search engines
E-learning systems	Television
E-mail	Tele-conferencing
Groupware	Video-conferencing
Information alerts	Virtual reality tools
Instant messaging	Visualising tools
Intelligent agents	Web tools (including crawlers, file sharing etc)
Internet/intranet/extranet	Workflow management
IT infrastructure	Yellow Pages ²³

Table 2.8 Consolidated list of knowledge management tools

Clearly, based on the evidence of the findings of this search of the literature there are many different practices (methods) and tools (technologies), which can be deployed in support of a knowledge management initiative. The contents of Table 2.7 and 2.8 will provide a useful reference point when the case study organisation is analysed later in this research report.

²¹ It goes beyond the scope of this research to produce a composite list of practices matched specifically to tools, in effect to combine Table 2.7 and Table 2.8. Binney (2001) and Davel and Snyman (2005) have already gone some way to achieving this.

²² Includes access to all experts listed in a specific type of Expert Yellow Pages.

²³ Includes access to all employees in the Yellow Pages.

One of the management practices identified in Table 2.7 was the Community Of Practice (COP). The COP is one of the most widely reported examples of a practice used in knowledge management initiatives (Allee, 1997; Binney, 2001; Bouthillier and Shearer, 2002; BSI, 2003a, 2003b; CEN, 2004; Collison and Parcell, 2001; Davel and Snyman, 2005; Elliott and O'Dell, 1999; Liebowitz and Chen, 2004; Ruggles, 1998; Rumizen, 2002; SAI, 2001, 2003; Sandrock, 2004; Skyrme, 1998; van den Berg and Snyman, 2003; Wenger, 2000). This research project included the evaluation of the case study organisation through a specific community of practice. It is therefore appropriate to explore this knowledge management practice in more detail.

The community of practice idea has been in existence for some time: “communities of practice are nothing new. They have been around for a long, long time - as long as human beings have learned together...communities of practice are everywhere,” (Wenger, 2000:207). A community of practice may be an informal, self-organised collaboration of people, within or between organisations, who share common practices, interests or aims. When the COP proves useful to its members over time, they may formalise its status by adopting a group name and a regular system of interchange through enabling tools (CEN, 2004). A community of practice may be used to share knowledge at the group or organisation level (Brown and Duguid, 1998).

Offering their interpretation of the definition of a COP, the BSI stated that, “they bring together people to share insights, develop expertise and to foster good practice through the exchange and creation of knowledge in a specific area,” emphasising that a COP focuses on, “building specific capability in the organisation and ensuring that this is protected and retained in the organisation as people move on,” (BSI, 2003a:34). Taking much the same approach, van den Berg and Snyman (2003) stated that the community is formed to share aspects of their work and to learn from each other, including sharing best practices, past experiences, insights and knowledge.

Wenger (2000) stated that a community of practice consists of three basic elements:

- “What it is about - the sense of joint enterprise that brings members together
- How it functions as a community - the relationship of mutual engagement that binds members together into a social entity. Members learn with one another.
- What capability its practice has produced - the shared repertoire of communal resources that members have developed over time through their mutual engagement,” (Wenger, 2000:208).

In discussing the composition of a community of practice, Wenger (2000:218) identified that typical categories of membership and participation include:

- “Core group - a small group of people whose passion and engagement energise the community
- Full membership - members who are recognised as practitioners and define the community
- Peripheral membership - people who belong to the community but with less engagement and authority
- Transactional participation - outsiders who interact with the community occasionally to receive or provide a service²⁴
- Passive access - a wide range of people who have access to artefacts produced by the community such as its publications, its website, or its tools.”

An example of communities of practice in action comes from Collison and Parcell (2001:10) who stated that in the case of British Petroleum (BP):

“People with common interests or discipline practices frequently form networks, or communities of practice, to share their know-how, either to improve the capability of each individual to do his or her job better, or to deliver on a common goal or objective” and that at BP “to make the best use of what BP knows, we build relationships with others who want to learn, and with those from whom we can learn. We call these sorts of knowledge-sharing groups ‘networks’ and ‘communities’. They are the key mechanisms for exchanging knowledge in BP,” (Collison and Parcell, 2001:38).

²⁴ An example of working with transactional members of the community is where input is used from communications specialists, graphic designers, instructional designers, and facilitators (SAI, 2001).

Some networks at BP are formal and have clear objectives, while others are less formal. The same authors added that COPs can build and apply common practices, develop common competences, add to common knowledge, and share ideas, tips, problems and solutions. Through accessing the knowledge held by the community, each individual can operate more effectively.

The nature of the community of practice as outlined in this section will be applied in the analysis of the case study organisation in Chapter 7.

2.4 Knowledge management and strategy

The interest in strategy in the business world can be traced back to the early 1960s to authors such as Ansoff, Drucker and Levitt, and later between 1973 and 1982 to works from Mintzberg, Ohmae and Porter (Koch, 1995).

A working definition of strategy would be useful for this research. Many definitions have been published (Ansoff, 1984; David, 1997; Koch, 1995; Porter, 1980). The one selected for this project is from Ansoff (1984:31) who defined strategy as, “a set of decision-making rules for guidance of organisational behaviour.” In more detail, the definition deals with four elements:

- Yardsticks by which performance is measured: objectives (quality measures) and goals (quantity measures)
- Rules about the relationship with the external environment (what to develop, where and to whom to sell, how to gain advantage over competitors): the business strategy
- Rules about internal relations and processes: the organisational concept
- Rules by which the firm conducts its day-to-day business: operating policies (Ansoff, 1984).

A strategy is required for successful implementation of knowledge management since, “effectively implementing a sound knowledge management strategy and becoming a knowledge-based company is seen as a mandatory condition of success for

organisations as they enter the era of the knowledge economy,” (Binney, 2001:33). In addition, “the most important context for guiding knowledge management is the firm’s strategy,” (Zack, 1999a:125). This relationship will now be explored in more detail.

2.4.1 Relationship between knowledge management strategy and business strategy

Accepting that an organisation needs a strategy, what needs to be understood is the relationship between business strategy and knowledge management strategy. A number of notable contributions have been made to this issue (Haggie and Kingston, 2003; Hansen *et al.*, 1999; Hofer-Alfeis and van der Spek, 2002; Manville and Foote, 1996; Smith and McKeen, 2003; Snyman and Kruger, 2004; Zack, 1999a, 2002).

Manville and Foote (1996) made the following observations, with a clear call to put strategy first:

- Knowledge-based strategies begin with strategy, not knowledge
- Knowledge-based strategies are not strategies unless you can link them to traditional measures of performance
- Executing a knowledge-based strategy is not about managing knowledge; it is about nurturing people with knowledge.

Hansen *et al.* (1999:114) seemed to agree when they stated that, “competitive strategy must drive knowledge management strategy...it is important for managers to make the explicit connection between their company’s competitive strategy and how they use knowledge to support it.” This point was also made by Zack who stated that, “the most important context for guiding knowledge management is the firm’s strategy,” (Zack, 1999a:125) and that firms need a “pragmatic but theoretically sound” knowledge strategy (Zack, 1999a:126). Zack (2002) later added that knowledge management strategy guides and defines the processes and infrastructure (organisational and technological) for managing knowledge. Hofer-Alfeis and van der Spek (2002) put the focus more on the enablement of management when they observed that, “the knowledge management strategy or roadmap is targeted at

knowledge management managers and their cross-business responsibilities to enable knowledge management,” (Hofer-Alfeis and van der Spek, 2002:26).

It is also important to note that, “different situations require different strategies,” (Haggie and Kingston, 2003: online)²⁵ and that, “the range of different ‘knowledge management strategies’ on offer can be bewildering and it is often unclear where to begin in choosing a strategy for a particular situation,” (Haggie and Kingston, 2003: online).

A more recent contribution came from Snyman and Kruger (2004) who provided further endorsement for the recognition of the link between knowledge management strategy and business strategy when they stated that, “the true power of knowledge lies in its ability to positively influence, and enable, the business strategy,” (Snyman and Kruger, 2004:7). However, they also identified that, “unfortunately, there is no generic model incorporating knowledge management strategy formulation with business strategy formulation,” (Snyman and Kruger, 2004:17).

Recognising the debate that exists concerning the relationship between knowledge management and business strategy, and the contributions made by the various authors mentioned in this section, the definition of a knowledge management strategy selected for use in this research is: “a declaration of how the organisation will use knowledge management methods, tools, processes, and practices to achieve business objectives by leveraging its content, people and processes and how [knowledge management] will support the organisation's overall strategy,” (CEN, 2004:online). This selection is based on the focus on the knowledge management methods, tools, processes, and practices, an understanding of part of which forms a key element of this research.

²⁵ For example, there are two key ways that knowledge management can be used to support business strategy: support for performance, where knowledge is used to improve quality and service; support for productivity, where knowledge can be used to shorten cycle times for development and delivery (Smith and McKeen, 2003:online).

2.4.2 Approaches to knowledge management strategy

A search of the literature revealed a number of different types of knowledge management strategy that can exist, as shown in Table 2.9. Each of the sources will be reviewed in turn.

APQC (O'Dell <i>et al.</i> , 1999) six strategies
Hansen <i>et al.</i> , (1999) two strategies
Zack (1999a) nine strategies
Binney (2001) six strategies
Earl (2001) seven schools (strategies)
Sveiby's (2001) three strategies
Von Krogh <i>et al.</i> (2001) four strategies
Day and Wendler (Haggie and Kingston, 2003) five strategies

Table 2.9 Knowledge management strategies²⁶

The APQC identified six knowledge management strategies (O'Dell *et al.* 1999):

- Knowledge strategy as business strategy: a comprehensive, enterprise-wide approach to knowledge management, where frequently knowledge is seen as the product
- Intellectual asset management strategy: focuses on assets already within the company that can be exploited more fully or enhanced
- Personal knowledge asset responsibility strategy: encourages and supports individual employees to develop their skills and knowledge as well as to share their knowledge with each other
- Knowledge creation strategy: emphasises the innovation and creation of new knowledge through research and development
- Knowledge transfer strategy: transfer of knowledge and best practices in order to improve operational quality and efficiency
- Customer-focused knowledge strategy: aims to understand customers and their needs and so provide them with exactly what they want.

²⁶ This table is shown in chronological order. Several views on knowledge management strategy were introduced as models or frameworks in section 2.3.4: O'Dell *et al.*, 1999; Hansen *et al.*, 1999; Binney, 2001; Earl, 2001; Sveiby, 2001.

These strategies can be addressed individually, or in combination, to achieve the objectives of the organisation.

The codification versus personalisation strategy advocated by Hansen *et al.* (1999), was based on using the combination of a primary strategy (either codification or personalisation) and secondary strategy (either codification or personalisation) on an 80:20 basis, depending on a number of factors²⁷ but the authors warned that, “executives that try to excel at both strategies risk failing at both,” (Hansen *et al.*, 1999:112)²⁸.

Zack (1999a) recognised the validity of the ‘tacit versus explicit’ concept of knowledge and proposed mapping knowledge as a key activity contributing to strategy formulation. Having completed a mapping exercise it would be possible to identify knowledge gaps. Zack discussed two key gaps: the knowledge gap (either internal or external in nature) and the strategic gap (the difference between what a firm is doing and what it should be doing). The strategy formulated would be directed to closing those gaps.

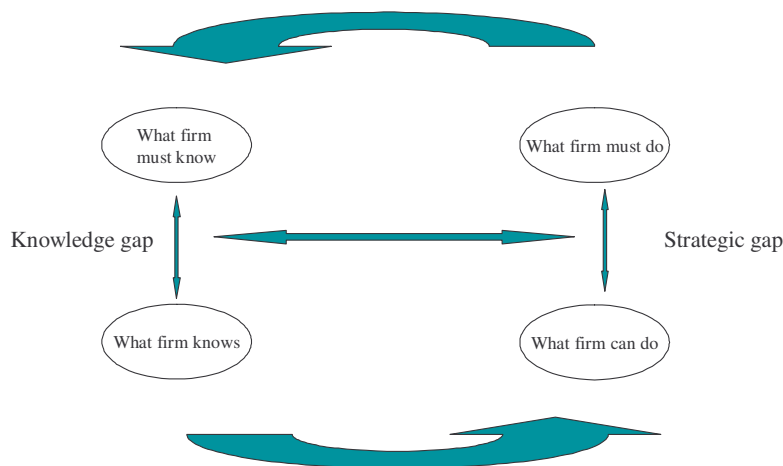


Figure 2.2 Strategic gap model
(Source: Zack, 1999a)

²⁷ As discussed in section 2.3.4, knowledge management models and frameworks.

²⁸ Support comes from Grover and Davenport (2001:8) who stated that, “companies using codification approaches rely primarily on repositories of explicit knowledge. Personalisation approaches imply that the primary mode of knowledge transfer is direct interaction among people. Both are necessary in most organisations but an increased focus on one approach or the other at a given time within a specific organisation may be appropriate.”

To close the gaps identified in Zack’s model (Figure 2.2), he proposed an implementation based on exploitation (internal gap closure) or exploration (external gap closure). Those firms combining exploitation with exploration he called *innovators*. Those firms who closely integrate their knowledge regardless of whether the source is internal or external are *unbounded*. Zack suggested combining an external/internal focus with an *exploiter/explorer/innovator* use of knowledge to build a knowledge strategy grid with *conservative* (based on exploiting existing internal knowledge) and *aggressive* extremes (based on unbounded innovation), as shown in Table 2.10.

	Use of knowledge		
Primary source of knowledge	Exploiter	Explorer	Innovator
Unbounded			Aggressive
External			
Internal	Conservative		

Table 2.10 Strategic implementation matrix
(Source: Zack, 1999a)

Binney’s (2001) contribution to knowledge management strategy was based on his ‘Knowledge Management Spectrum’ (as introduced in section 2.3.4), where he grouped a number of knowledge management applications into six major elements or strategies, whilst Earl’s (2001) contribution was based on the seven schools of knowledge management he identified, each of which could be treated as an individual strategy or used in combination under the umbrella of a single multi-dimensional knowledge management strategy (see section 2.3.4). Sveiby’s (2001) knowledge management strategy was based on his analysis of the three knowledge asset types (internal structure, external structure and individual competence) and the relationship between them (also briefly mentioned in section 2.3.4).

Von Krogh *et al.* (2001) developed a framework of four generic strategies for managing knowledge (see Table 2.11), which drew heavily on a case study at Unilever. Their work described how the two core processes of knowledge creation and transfer (sharing) are central to the strategies identified. They suggested that the strategy be based on the combination of knowledge domains (existing/new) and knowledge processes (transfer/creation) and that organisations could formulate their knowledge strategy by examining how each strategy impacts on the strategic goals of efficiency, innovation and managing risk.

Knowledge domain	Knowledge process	
	Transfer	Creation
Existing	<i>Leveraging strategy</i>	<i>Expanding strategy</i>
New	<i>Appropriating strategy</i>	<i>Probing strategy</i>

Table 2.11 Generic strategies model
(Source: Von Krogh *et al.*, 2001)

The last of the major views on knowledge management strategies identified was from Day and Wendler (cited in Haggie and Kingston, 2003). Their research identified five strategies employed by large corporations:

- Developing and transferring best practices
- Creating a new industry from embedded knowledge
- Shaping corporate strategy around knowledge
- Fostering and commercialising innovation
- Creating a standard by releasing proprietary knowledge.

Taken together, these sources (as listed in Table 2.9) do indeed represent the ‘bewildering’ choice identified by Haggie and Kingston (2003). The authors’ strategies vary from as few as two to as many as nine; there are a total of nearly forty strategies identified. Some strategies are common or very similar (such as the emphasis on create/transfer from O’Dell *et al.* (1999) and Von Krogh *et al.* (2001)),

whilst others are unique (such as the ‘creating a standard by releasing proprietary knowledge’ strategy of Day and Wendler (Haggie and Kingston, 2003).

As has already been identified earlier in this chapter, “the most important context for guiding knowledge management is the firm’s strategy,” (Zack, 1999a:125). Choosing between the possible strategies identified in Table 2.9 is addressed next.

2.4.3 Selecting a knowledge management strategy

Although many of the authors have recommendations as to how to choose between the strategies they propose, they do so within the confines of the strategy model as they themselves have compiled it. Only Haggie and Kingston (2003), independent of a strategy model they were proposing, identified a number of factors relating to the overall business strategy which might influence the selection of an appropriate knowledge management strategy, using seven broad dimensions or groups of factors to assist in the task, as shown in Table 2.12.

Factor	Examples
Current/planned knowledge management strategy	Goals, desired applications, technology capabilities
Business sector characteristics	Highly regulated, innovative, risk factors, competitiveness, globalisation, etc
Strengths, weaknesses, opportunities, and threats (SWOT) of the business	Reputation, leading product, changing regulations, acquisitions and mergers, globalisation, etc
Value focus strategies ²⁹	Operational excellence, product leadership or customer-focused
Organisational structure	Hierarchical, loose
Organisational culture	Team spirit, individualistic, sharing, learning
Nature of knowledge	Explicit, implicit or tacit; Task type

**Table 2.12 Knowledge management strategy selection
(Source: Haggie and Kingston, 2003)**

This has the merits of being broad (in terms of the number of factors addressed) as well as flexible (in terms of the relative importance or weighting given to each of the factors). Using the classification as detailed in Table 2.12, combined with identifying

²⁹ These strategies were first identified in 1995 by Treacy and Wiersma (APQC, 2000).

the ‘best fit’ between the various strategies advocated by the authors listed in Table 2.9, represents one possible way to undertake knowledge management strategy selection³⁰.

2.4.4 Contents of a knowledge management strategy

Having identified which strategy to implement, the next issue is what precisely that strategy comprises. Many of the authors in Table 2.9 have little to say on what precisely comprise the contents of a knowledge management strategy. The most comprehensive source identified from the literature was from BSI (2003a:32) who identified eleven elements of a knowledge management strategy:

- Organizational priorities for knowledge management (in terms of strategy and market needs)
- Knowledge management vision and mission
- Knowledge management operating plan (objectives and perceived benefits)
- Knowledge management budget
- Plan for knowledge management technical infrastructure
- Proposed knowledge management organisational structure
- Plans for knowledge management communities of practice
- Proposed knowledge management metrics and knowledge sharing incentives and rewards
- Plans for knowledge management training
- Plans for communication of knowledge management strategy to internal and external stakeholders
- Plan for integrating knowledge management and organisational strategy.

These, then, represent the elements of a strategy definition, which in the ultimate application would form the ‘table of contents’ of an actionable knowledge management strategy document. What remains to be determined are the actual steps to take in implementing the chosen strategy.

³⁰ This activity would form part of the development of a specific strategy designed to best meet the needs of the organisation and would typically be achieved as part of the implementation process which is about to be discussed.

2.4.5 Knowledge management strategy implementation

A review of the literature identified eight significant contributions to the subject of implementing a knowledge management strategy (each listed here with the number of steps recommended): Zack (1999a) fourteen steps; APQC (2000) five steps; Tiwana (2000) ten steps; Earl (2001) six steps; Ndlela and du Toit (2001) four steps; BSI (2003a) eight steps; Smith and McKeen (2003) six steps; Snyman and Kruger (2004:17) four steps. The specifics of the recommendations from each of these sources are listed in Table 2.13³¹.

<p>Zack (1999a) (These are the steps proposed by Zack formulated as questions) How do you want to play the game? What do you need to know? What do you know? What is the internal knowledge gap? What do your competitors know? What is your external knowledge gap? What is your learning cycle? What are your competitors' and industry learning cycles and capabilities? What is your learning gap? What is your internal strategic gap? What is your external strategic gap? What is your industry cycle strategic gap? What is your new current and future strategy? What's your knowledge strategy?</p>
<p>APQC (2000) Get started Develop knowledge management strategy Design and launch knowledge management initiatives Expand and support knowledge management Institutionalise knowledge management</p>
<p>Tiwana (2000) Analyse the existing infrastructure Align knowledge management and business strategy Design the knowledge management infrastructure Audit existing knowledge assets and systems Design the knowledge management team Create the knowledge management blueprint</p>

³¹ In several cases the implementation steps are posed as questions which need to be answered as part of the implementation project.

<p>Develop the knowledge management system</p> <p>Deploy, using the results-driven incremental methodology</p> <p>Manage change, culture and reward structures</p> <p>Evaluate performance, measure ROI, and incrementally refine the knowledge management system</p>
<p>Earl (2001)</p> <p>(These are the steps proposed by Earl formulated as questions)</p> <p>What is the knowledge business vision?</p> <p>What is the business performance gap?</p> <p>How could knowledge make a difference?</p> <p>What are the alternative knowledge management initiatives?</p> <p>What is the degree of fit and feasibility?</p> <p>What is the knowledge management program?</p>
<p>Ndlela and du Toit (2001)</p> <p>Enterprise analysis: the enterprise's orientation to knowledge management</p> <p>External analysis: the external elements of the enterprise including the identification of threats and opportunities</p> <p>Decide and formulate a suitable knowledge management strategy: depends on the enterprise's vision and mission and how knowledge management can contribute</p> <p>Implement and evaluate knowledge management strategy: prioritise activities and ensure integration with other business processes</p>
<p>BSI (2003a)</p> <p>Setting up appropriate communications channels</p> <p>Organising content for efficient access and to identify gaps</p> <p>Ensuring well-informed support team is in place</p> <p>Communicating to the sponsoring/supporting community or the whole organisation</p> <p>Measuring progress</p> <p>Create a compelling rationale and business case for knowledge management to senior management</p> <p>Establishing pilot initiatives to achieve early wins and measurable business gains</p> <p>Implement a communication/change strategy</p>
<p>Smith and McKeen (2003)</p> <p>Understanding the strategic goal</p> <p>Strategic analysis</p> <p>Strategic direction</p> <p>Specific knowledge management initiatives</p> <p>Strategic case for knowledge management</p> <p>Executing a knowledge management strategy</p>
<p>Snyman and Kruger (2004)</p> <p>Analysis of the internal and external environment (including identifying the strategic gap)</p> <p>Setting objectives (intended to close the strategic gap identified in the previous step)</p> <p>Establishing strategic initiatives (including development of the strategic knowledge management plan)</p> <p>Strategy institutionalisation</p>

Table 2.13 Knowledge management strategy implementation steps³²

³² This table is shown in chronological order.

Some of the implementation steps are closely tied to the strategies identified by the author (such as for Zack, 1999a) whereas others are more generic and could be applied whatever the source of the chosen strategy (such as APQC, 2000; Snyman and Kruger, 2004). Some of the steps described are similar between sources (such as the internal/external analysis of Ndlela and du Toit, 2001; Smith and McKeen, 2003; Snyman and Kruger, 2004; measurement/evaluation for Tiwana, 2000), whereas others contain unique elements not found elsewhere (such as the learning cycle of Zack, 1999a). The most common factor between all of these implementation recommendations is the sense of a journey that needs to be undertaken in order to achieve the goal of a successful knowledge management strategy implementation. No one approach to implementation is 'right' or 'wrong' as each has its merits. What is perhaps a deciding factor is how well the recommended steps fit the specific situation in an organisation.

2.5 Summary

In line with the overall research problem in this study, the purpose of this chapter was to explore the nature of knowledge and knowledge management. This was achieved by a non-empirical review of the literature on those two subjects.

What became clear was that there is no single, generally agreed definition for either knowledge or knowledge management, but there is a general agreement on their importance to the success of today's organisations, particularly when viewing knowledge as a resource which can contribute to the success of the organisation.

The investigation into the nature of knowledge management included an understanding of the literature on objectives, success factors, models/frameworks, processes, roles, practices and tools. The chapter concluded with an in-depth look at knowledge management and strategy, and identified a number of alternative strategies and recommendations for the implementation of a knowledge management strategy. The concepts, principles, models and views identified from the literature served as a guide both in the conduct of the research as well as in the analysis of the empirical data findings.

The research for this chapter confirmed several important issues for this research study as a whole. First, that the sharing of knowledge is a recognised practice in implementing knowledge management. Secondly, that stories and storytelling are recognised in the literature as practices for knowledge sharing. Third, that the community of practice is a recognised knowledge management practice.

In line with the main problem in this research study, the focus of the next chapter will be an understanding of the key ideas associated with a particular aspect of knowledge sharing: the use of stories and storytelling to share knowledge.