Utilising human capital as an organisational asset

C.E. Human Hons. B.Sc.

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ABSTRACT

The objectives of this study are to determine the awareness level of knowledge sharing amongst the employees of Sasol, to determine how Sasol utilises human capital in the company and to identify and analyse the methods of knowledge sharing and knowledge transfer.

The literature review distinguishes between explicit and tacit knowledge. Explicit knowledge leads a company to codify while tacit knowledge leads to connecting people. The literature study also covers the utilisation of human capital and identifies methods of knowledge sharing and -transfer, namely legacy pages, expert location systems, buddy systems, post-retirement agreements, identification of successors, After Action Reviews, interviews, observation, protocol analysis, teachbacks, storywriting and storytelling, and process mapping. The literature study forms the foundation for the formulation and designing of a questionnaire.

The questionnaire was distributed amongst the employees of two of Sasol's divisions in order to obtain data about the utilisation of human capital in Sasol and to identify and analyse the current and preferred methods to capture and share tacit knowledge and skills.

The data obtained from the questionnaires was processed, analysed and interpreted. Conclusions were drawn, linking the literature review and the results obtained from the empirical study. Based on these conclusions, recommendations were made.

Key Words: Tacit knowledge, Explicit knowledge, Community of Practice, Buddy system, After Action Reviews, Process Mapping, Rotation, Mentoring, Coaching, Best practices, Legacy pages, Human capital, Knowledge sharing.

OPSOMMING

Die doel van die navorsing is om die werknemers van Sasol se bewustheid aangaande kennisoordrag te bepaal, die wyse waarop Sasol hul werknemers as bate aanwend, te ondersoek, sowel as om metodes vir kennisoordrag te identifiseer en te analiseer.

Die literatuurstudie onderskei tussen eksplisiete en implisiete kennis. Eksplisiete kennis gee aanleiding tot kodering van inligting terwyl implisiete kennis mense met mekaar verbind. Die literatuurstudie raak ook die onderwerp van die mens as bate vir 'n organisasie aan en identifiseer verskeie metodes om kennis te deel en oor te dra. Die literatuurstudie vorm die grondslag vir die formulering van 'n vraelys.

Die vraelys is versprei aan werknemers van twee Sasol-afdelings. Die doel van die vraelys is om die bewustheid aangaande kennisoordrag te bepaal sowel as om die huidige- en verkose metodes vir oordrag van kennis en vaardighede te identifiseer en te analiseer.

Die verwerkte data is geanaliseer en geïnterpreteer. Gevolgtrekkings is gemaak uit die literatuur en empiriese studies wat dan gelei het tot aanbevelings.

To my parents for all their love and support

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CHAPTER 1

Introduction and background to the research problem

1.1 Introduction

"The growing discrepancy between market value and book value is largely attributed to intellectual capital, the intangibles of the business that underpin future growth. Intellectual capital includes assets such as brands, customer relationships, patents, trademarks and, of course, knowledge".

(Skyrme, 2003).

David Skyrme (1999b) states that knowledge encompasses both tacit knowledge (the knowledge which resides in workers) and explicit knowledge (codified and expressed as information in databases and documents).

As more and more companies realize the importance of knowledge as a corporate asset, the need to nurture and manage this knowledge to effectively create a sustainable advantage also becomes part of their strategies for the future (Davenport and Prusak, 1998:12). Thomas A. Stewart (1996) even stated that knowledge has become the primary ingredient of what we make, do, buy, and sell, and ventured to say that managing such knowledge, intellectual capital, has become the most important economic task of individuals, businesses, and nations.

Competitiveness happens through excellent people. Good Knowledge Management practices will ensure that we learn a lesson once. How many times have you worked very hard at something to find out later all you did was reinvent something someone else had already done? This is just one of many reasons why companies should start measuring intangible assets, such as knowledge. "*What gets measured gets managed.*" (Skyrme, 2003)

Organisations suffer vast intellectual capital losses due to employees emigrating, changing careers and retiring. Are there means to capture the tacit knowledge that leaves the organisation with these employees?

1.2 Problem statement

Organisations lack a practical and proven knowledge management strategy to manage knowledge for continuous improvement, innovation and ultimately competitive advantage (Hiscock, 2005:13).

Companies recognize knowledge as a key source of competitive advantage in the business world, but still have little understanding of how to capture it in practice. Traditional knowledge management approaches attempt to capture existing knowledge within formal systems, such as databases. Yet, systematically addressing the kind of dynamic "knowing" that makes a difference in practice requires the participation of people who are fully engaged in the process of creating, transferring and using knowledge.

The intent of doing this research project is to find means of utilising human capital to the full, capturing the tacit knowledge and skills.

1.3 Specific goals of this study

- To determine Sasol employees' awareness of knowledge management with specific focus on knowledge sharing
- To determine the way in which Sasol utilises human capital
- To identify and analyse processes / methods to capture the tacit knowledge and skills of employees in Sasol.

1.4 Research Methodology

An in-depth literature study would commence to:

- Analyse the utilisation of human capital.
- Identify and analyse methods of knowledge sharing and transfer.

The literature study will form the foundation for the formulation and designing of the questionnaire. The data obtained through the research will be analysed in order to obtain information on best practises to capture tacit knowledge and skills.

In the study, the primary focus will be on primary data collection methods, within which use will be made of the questionnaire in Appendix A.

Permission was obtained to distribute the questionnaire in two of Sasol's divisions namely Sasol Synfuels and Sasol Wax. The research sample will consist of employees from different functional divisions, different age groups and different positions.

1.5 Chapter outline

- **Chapter 1: Introduction and background to the research problem:** This chapter provides a background to the purpose of this research study, stating that companies realise the importance of knowledge as a key source of competitive advantage but that they have limited understanding of how to capture it.
- **Chapter 2: Literature study:** The literature study provides an understanding of what knowledge is and distinguishes between the types of knowledge. It also focuses on human capital and the utilisation thereof. The literature review identifies and discusses methods of knowledge sharing and -transfer.
- **Chapter 3: Empirical study:** The empirical study provides background information on knowledge management in Sasol. It also provides the composition of the research sample and states what the purpose of the study is.
- **Chapter 4: Results analysis and interpretation:** This chapter provides the results from the questionnaire by indicating the employees' awareness of knowledge sharing, the utilisation of human capital in Sasol as well as an analysis of the current and preferred methods of knowledge sharing.
- **Chapter 5: Conclusions and recommendations:** This chapter links the literature study to the empirical study in the form of conclusions. Based on these conclusions, recommendations are made.

1.6 Terminology

Term	Definition	Reference in text
Tacit knowledge	Knowledge that includes know-how, judgment, experience, insights, rules of thumb and skills (Rumizen, 2002:9).	Par. 1.1, 1.2, 1.3, 1.4, 2.2, 2.2.2, 2.3.1, 2.4, 2.4.1, 3.1, 3.2, 5.1.2
Explicit knowledge	Knowledge that can be said, written down and transmitted (Rumizen, 2002:8).	Par. 1.1, 2.2, 2.2.1, 2.2.2, 2.3.1, 2.4
Community of Practice	A group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on a ongoing basis (Wenger et al., 2002:4).	Par. 2.2.2, 2.4.1, 4.3, 4.3.2, 5.1.2
Buddy system	A process where a person is shadowing another person in order to learn as much as possible from that person (Smoot, 2003:4).	Par. 2.4, 3.1, 4.3, 4.3.2, 5.1.2, 5.2
After Action Reviews	A technique to capture lessons form engagements, while they are still fresh in peoples minds (Skyrme, 1999b).	Par.2.4, 3.2, 4.3.2
Process Mapping	A method of documenting a cross-functional process (Hiscock, 2004b).	Par. 2.4, 3.2, 4.3.2, 5.1.2
Rotation	A process that allows employees to move between divisions and departments (ANON1, 2005).	Par. 4.3.2, 5.1.2

Mentoring	A process that helps a person (mentee) to set long-term goals that can assist in overall development (ANON6, 2005).	Par. 4.3, 4.3.2, 5.1.2
Coaching	A process that helps a person to set short-term goals that can assist in improvement of performance (ANON6, 2005).	Par. 2.4.1, 4.3, 4.3.2
Best practices	Processes and procedures that have shown to be effective in one place that could be effective in another (Rumizen, 2002:102).	Par. 2.2.2, 2.4.1, 3.1, 4.3, 4.3.2, 5.1.2
Legacy pages	Online listing of personnel, their competencies and their contact information (Koulopoulos and Frappaolo, 1999:199).	Par. 2.2.2, 2.4, 3.2, 4.3, 4.3.2, 5.1.2
Human capital	Consists of the knowledge, skills and experience of an individual (Skyrme, 1999a:58).	Par. 1.2, 2.3, 3.2, 4.2
Knowledge sharing	The sharing of knowledge or information between members of staff within an organisation (Robertson, 2004).	Par. 2.4, 2.4.1, 2.5, 3.1, 3.2, 4.1, 4.2, 4.3, 4.3.1, 4.3.2, 5.1.1, 5.1.2, 5.2

CHAPTER 2

Literature study

This chapter reflects the result of a literature review that:

- Provides an overview of the concept of knowledge;
- Discusses the utilisation of human capital and specifically the role of knowledge therein; and
- Identifies, defines and discusses methods that could be used for the sharing and transferring of knowledge.

2.1 Introduction

> *"In an economy where the only certainty is uncertainty,*
> *the one sure source of lasting competitive advantage is knowledge".*
>
> (Nonaka, 1998:21)

Allee (1997:27) defines knowledge as experience, concepts, beliefs or information that can be communicated and shared. Rumizen (2002:6) describes knowledge as information in context to produce an actionable understanding. Moyer (2004:155) declares that knowledge is the sum of education and experience.

New knowledge always begins with the individual. Making personal knowledge available to others is the central activity of the knowledge-creating company. It takes place continuously and at all levels of the organisation.

2.2 Types of knowledge

Knowledge experts distinguish between two very different types of knowledge, namely explicit knowledge and tacit knowledge. Most analysts see explicit knowledge as knowledge that has been captured and codified into manuals, procedures, and rules that is easy to disseminate. Tacit knowledge, on the other hand, is knowledge that cannot be easily articulated and thus only exists in people's hands and minds, and manifests itself through their actions (Stenmark, 2000:9).

2.2.1 Explicit knowledge

Rumizen (2002:8) declares that explicit knowledge can be said, written down and transmitted (shared with others, and put into a database). It is objective, lending itself to rules and definitions. It is easily captured, stored and transmitted electronically. Koulopoulos and Frappaolo (1999:42) define explicit knowledge as knowledge that can be articulated in formal language and transmitted easily amongst individuals. They continue by stating that by its nature, it is capable of being widely distributed or diffused.

Koulopoulos and Frappaolo (1999:45) provide the following three reasons why organisations have focused their information-technology investments on explicit knowledge rather than tacit knowledge:

- Explicit knowledge is often conveyed as a standard part of most transaction-based information systems.
- It is much easier to convey and capture than tacit knowledge.

- People have an inherent mistrust of anything that cannot be conveyed objectively and quantified.

2.2.2 Tacit knowledge

Allee (1997:45) and Rumizen (2002:8) are of the opinion that tacit knowledge is personal and includes know-how, judgement, experience, insights, intuition, hunches, rules of thumb, and hands-on skills. It exists within context, but it is unspoken and pivots on "mental models" that people carry internally (Allee, 1997:45). As Michael Polyani puts it "*We can know more than we can tell*". Leonard and Sensiper (as quoted by Stenmark, 2000:9) go even further by stating that "*We can often know more than we realise*".

To play golf well is not to be a skilful solver of partial differential equations; instead it is to be a skilful interpreter of previous experiences. Dreyfus and Weizenbaum (as quoted by Stenmark, 2000:10) state that it is not a set of rules or a formal representation of knowledge that is critical to intelligence (i.e. explicit knowledge), but rather the interaction of the mind with the body's experiences (i.e. tacit knowledge).

Dorothy Leonard-Barton (as quoted by Rumizen, 2002:60) believes that 80 percent of the important knowledge in an organisation is tacit, and that tacit knowledge resists codification. Concentrating on explicit knowledge leads you to codify, should this be the case, you will live or die by your information technology as well as the goodness of the content, thus you are developing the equivalent of books for a huge library. Concentrating on tacit knowledge leads you to connect people.

Ways to connect people:

1. **Community of Practice:** Etienne Wenger and William Snyder used the term "Communities of Practice" to describe "groups of people informally bound together by shared expertise and passion for a joint enterprise" (Buckman, 2004:163). The purpose of a Community of Practice is to create and share knowledge around a common area of interest and practice. Communities of Practice are networks of individuals working in a common area of interest. Allee (1997:219) states that Communities of Practice form spontaneously and cannot be created or designed, but they can be supported.

2. **Legacy pages (Blue / Yellow pages):** Blue / Yellow pages are a corporate mechanism to help people locate others in the organisation with the required expertise (Rumizen, 2002:98). It is often referred to as "Yellow Pages", since it takes on the form of an online directory of experts (Skyrme, 1999a:57). This mechanism is a way to connect people as well as to document knowledge.

3. **Best Practices:** Gibbert and Krause (2002:91) define best practices as those practices that have been shown to produce superior results. Allee (1997:196) states that best practices are observable behaviours and processes. Best practices are something that has been shown to be effective in one place that could also be effective in another (Rumizen, 2002:102). The purpose of a best practice system is to make it possible to find and use what is already there in order not to reinvent the wheel.

4. **Lessons learnt:** ANON6 (2005) defines lessons-learnt as a concise description of knowledge derived from experiences that can be communicated through mechanisms. These lessons often reflect on "what we did right", "what we would do differently", and "how we could improve our process and product to be more effective in the future".

5. **Project documentation and reporting process:** Project documentation and reporting processes provide an overview of all the facts and numbers of the project. It also describes the problems encountered during project execution with proposals for improvements (Hiscock, 2004a).

2.3 Utilisation of human capital

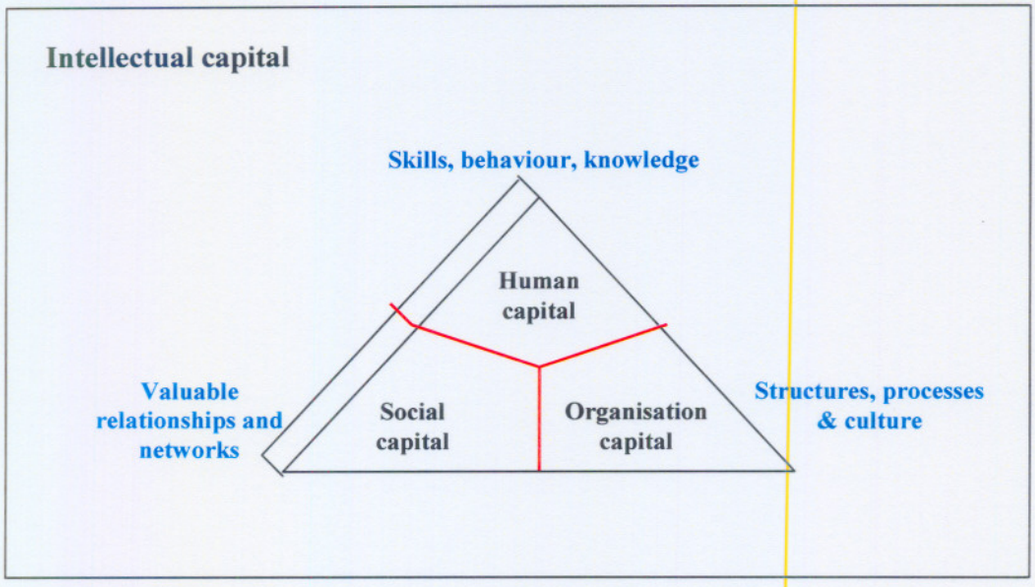
The effective management of a company's resources is becoming more and more recognised as the key to the company's success. Fully utilising their human capital helps companies to raise the level of efficiency, competitiveness and the necessary innovation to retain leadership positions (ANON4, n.d.). Utilisation indicates the extent to which employees are able to apply their skills for the organisation's benefit.

A great deal is known about, for example, marketing, production management, information technology, the financing of businesses and the formal governance and organisation of business entities. How to measure, evaluate and report on all of these areas, are also known. Human capital, however, is still in many circumstances a relative mystery. People are often the largest cost in a business and will always be one of the most significant. The challenge is to bring some rigour and consistency to investment in the people domain.

Dess and Picken (as quoted by Stiles and Kulvisaechana, n.d.:8) state that human capital is generally understood to consist of the individual's capabilities, knowledge, skills and experience of the company's employees and managers, as they are relevant to the task at hand, as well as the capacity to add to this reservoir of knowledge, skills, and experience, through individual learning. Koulopoulos and Frappaolo (1999:201) define human capital as the collective value of an organisation's know-how. Human capital refers to the value, usually not reflected in accounting systems, which results from the investment an organisation must make to recreate the knowledge within its employees.

Rastogi (as quoted by Stiles and Kulvisaechana, n.d.:5) states that the concept and perspective of human capital stem from the fact that there is no substitute for knowledge and learning, creativity and innovation, competencies and capabilities; and that they need to be relentlessly pursued and focused on the firm's environmental context and competitive logic. According to them there must also be a desire on the part of individuals to invest their skills and expertise in the organisation and their position. In other words, individuals must commit to or engage with the organisation if effective utilisation of human capital is to happen. They state that, in addition to human capital, there must also be social capital and organisational capital. These three forms of capital contribute to the overall concept of intellectual capital - see diagram 2.1. This, in turn, will affect the management of knowledge within the organisation.

Diagram 2.1: Intellectual capital



Source: Stiles and Kulvisaechana (n.d.:6)

Knowledge has long been recognized as a valuable resource and has been a focus of attention in the human capital literature, in particular the issues of knowledge generation, leverage, transfer and integration. Given the importance of knowledge in the organisation it becomes crucial that the employees who are the source of knowledge are managed well. This requires that firms define knowledge, identify existing knowledge bases, and provide mechanisms to promote the creation, protection and transfer of knowledge.

Skyrme (2003) states that many organisations do not know what they already know and knowledge gained is not necessarily recorded for use later on. A knowledge inventory is a practical way of getting to grips with "knowing what you know". Equally important to companies is the creation of an environment

and culture where people share their knowledge through personal interaction, and are recognised and rewarded for doing so.

To conclude, knowledge management is not only about managing this knowledge asset (the employees), but also managing the processes that act upon the asset. These processes include: developing knowledge, preserving knowledge, using knowledge and sharing knowledge (ANON5, 2003).

2.3.1 Knowledge as component of human capital

Knowledge has been conceptualised and characterised in a number of ways in the literature but a major point of commonality has been the distinction between tacit knowledge and explicit knowledge.

The fundamental issue with tacit knowledge is its intangibility. Pfeffer & Sutton (as quoted by Stiles and Kulvisaechana, n.d.:9) argue that the knowledge-doing gap (translating knowledge into action) is at least as important as accumulating knowledge in the first place. In other words, attending to the conditions under which people are prepared to share and act upon their knowledge, is a major component of human capital management.

Koulopoulos and Frappaolo (1999:178) assert that the most difficult objective of knowledge management, and the most valuable contribution it can make, is to enable organisations to share their tacit knowledge more effectively. They state that tacit knowledge contains the keys to the corporate knowledge kingdom. It is the arsenal for more complex, more powerful and better-informed knowledge. By definition, tacit knowledge is difficult to convey to others; for those

organisations that are able to do so, their competitors must surmount similarly difficult hurdles to remain abreast.

Although tacit knowledge constitutes the major part of what we know, it is difficult for organisations to fully benefit from this valuable asset. This is because tacit knowledge is inherently elusive, and in order to capture, store, and disseminate it, it is argued that it first has to be made explicit. According to Stenmark (2000:9) such a process is difficult, and often fails due to three reasons:

- We are not necessarily aware of our tacit knowledge, on a personal level;
- We do not need to make it explicit in order to use it; and
- We may not want to give up valuable competitive advantage.

Stenmark (2000:9) states that expertise is a quality highly dependent on tacit knowledge, and it can often only be observed and recognised through its resulting actions. The study of (tacit) knowledge must be done with caution, since it is a valuable asset and often related to power. An interesting but also troublesome property of tacit knowledge, is the inherent tension between its value on the one hand and its elusiveness on the other hand.

According to Skyrme (1999a:48) tacit knowledge is the most valuable knowledge that an organisation possesses. It resides in the heads of employees and stakeholders, especially customers. However, people leave organisations, and walk away with their knowledge. The crux of a knowledge strategy is therefore to seek ways of turning personal tacit knowledge into organisational knowledge. The two complementary approaches are:

- Converting it into a more explicit form - in documents, processes and databases, through elicitation and articulation; and

- Enhancing tacit knowledge-flow through better interaction, such that the knowledge is more widely diffused around the organisation and not held in the heads of a few.

Corrall (1999:3) agrees with the abovementioned statement stating that the practical management objectives are similar: to convert human capital (individual learning/team capabilities) to structural capital (organisational knowledge or 'what is left when people go home') and thereby move from tacit to explicit knowledge, and reduce the risk of losing valuable knowledge if people leave the organisation. She further explains that knowledge management initiatives usually involve the selection of priority areas for initial effort, and a combination of making explicit knowledge more visible and usable, and making tacit knowledge explicit, public and useful.

Corrall (1999:4) continues by declaring that, to convert tacit knowledge to organisational knowledge is the key objective, exemplified by creating databases of frequently asked questions, searchable by both employees and customers, and compiling lists of what went right and what went wrong in projects (lessons learnt) as guidelines for similar future undertakings. In addition to improving the visibility of knowledge, another aim is to develop its intensity, by creating a climate to encourage generation of ideas and generalisation to other areas.

2.4 Methods of knowledge sharing and transfer

According to Bednar (1999:1) it is accepted that two-way face-to-face communication is the ideal way to accomplish a successful transfer of tacit knowledge. As more institutions increase in size and geographical scope, their experience is dispersed around the globe and personal links are weakened. Face-to-face communication may promote knowledge sharing, but modern organisations are confronted by high levels of employee turnover that have resulted in short-term professional relationships.

Therefore we cannot solely rely on two-way communication to capture a person's tacit knowledge; other methods should also be used. The following ways to capture knowledge were identified in the literature consulted and we could still add to the list:

Methods to capture knowledge:

1. **Legacy pages:** are mechanisms to assist people in locating others in the organisation with the required expertise (Rumizen, 2002:98).
2. **Expert location systems:** are systems that capture the thinking processes of experts as sets of rules for use in diagnosis and problem solving applications. The knowledge gained through these processes is then used to assist other employees in similar situations (Hiscock, 2004b).
3. **Buddy systems:** are processes in which a person is shadowed by one or more "buddies" who will observe and learn from the person (Smoot, 2003:4).

4. **Post-retirement agreements:** are contracts with employees that have retired but due to the contract they can still contribute after they have left (Smoot, 2003:4).
5. **Identification of successors:** This process should be done as early as possible according to Perry (2003:4). The successor should be brought together with the expert and knowledge engineer. It is beneficial to include new interims into these processes as they are able to pose questions directly to the expert.
6. **After Action Review / Learning History:** Kleiner and Roth (1998:140) define a learning history as a written narrative of an organisation's recent set of critical episodes.
7. **Interviews:** An interview is a conversation between two or more people where questions are asked to obtain information about the interviewee (ANON3, 2005).
8. **Observation:** Observation basically means watching something and taking note of anything it does (ANON3, 2005).
9. **Protocol analysis:** A method of studying mental processes in the performance of tasks by recording their spontaneous "thinking aloud" and subsequently segmenting the running commentary into discrete mental operations used in the accomplishment of the task (ANON2, 2005).
10. **Teachbacks:** A method of learning in which one person teaches another what they have learned (Pask, 1975).
11. **Storywriting and storytelling:** Since the beginning of civilisation, tribal people have gathered together to retell stories of important events. Kleiner and Roth (1998:142) declare that preliminary results indicate that this timeless storytelling prove powerful in a corporate setting. Hiscock (2004b) defines storywriting and storytelling as the skilled

delivery of stories used to present anecdotal evidence, clarify a point, support a point of view and crystallize ideas. Storytelling is the connecting device between data and reality. Stories can share a "truth" that data cannot. Storytelling can help bridge the gap between data and knowledge. It also could be the result of integrating information.

12. **Process mapping:** Tuggle and Goldfinger (2004:12) declare that there is much valuable tacit knowledge contained in organisational processes. They have proposed a four-step methodology for extracting the knowledge, namely focussing attention on the important organisational processes, mapping those processes, verifying the process map and identifying knowledge capture opportunities and deriving inferences from them. Hiscock (2004b) defines process mapping as a method of documenting a cross-functional process to graphically show the end-user, time sequences, interfaces, hand-offs, functional boundaries, and process ownership.

Nonaka (1998:28) suggests four basic patterns for creating knowledge in any organisation:

- From tacit to tacit: one individual share tacit knowledge directly with another - socialisation
- From explicit to explicit: an individual combines pieces of explicit knowledge into a new whole - articulation
- From tacit to explicit: an individual or team standardises the tacit knowledge, putting it together into a manual or workbook and embodying it into a product - combination
- From explicit to tacit: individuals use the newly-obtained tacit knowledge to broaden, extend and reframe their own tacit knowledge – internalisation

Mark McElroy, CEO of consulting firm Macro Innovation Associates, says the goal of collecting tacit knowledge needs to be more specific. Ask yourself, "*tacit knowledge about what*". Form the questions or situational orientations for which outgoing tacit knowledge may be needed in the future, and direct your efforts in the related areas more specifically (Stiles and Kulvisaechana, n.d.:5).

2.4.1. Success stories of knowledge sharing methods

The literature identified the following successful implementation of knowledge sharing methods:

- *British Petroleum* created a "yellow pages" system to connect employees to knowledge and to each other when they merged with Amoco (Rumizen, 2002:98). They have also experimented with a formal coaching program but this program was difficult to scale up. *British Petroleum* takes project reviews even further by establishing a post-project appraisal unit to review major investment projects, write up case studies and derive lessons for planners that were then incorporated into revisions of the company's planning guidelines. This type of review is now conducted regularly at the project level (Garvin, 1998:62).
- The *American Red Cross* has a best practise system, which grew, in little more than a year, from a system with a few best practices to one with more than one hundred (Rumizen, 2002:103).
- *Boeing* commissioned a lessons-learnt project, called Project Homework, after they experienced difficulties with the 737 and 747 plane programs (Garvin, 1998:62).
- *SAP America* kicked off the Community of Practice when a competitor had come out with a product that quickly had captured a big chunk of market

share. One thing SAP had to do in order to win back the market was to make sure that their consultants had the best and latest information on SAP's offerings. It started off with limited participation in the community but it soon tripled (Rumizen, 2002:95).

- *British Airways* is a notable example of face-to-face knowledge sharing. The sharing of knowledge is facilitated by bringing individuals together either physically or virtually. Both explicit and tacit knowledge are exchanged during the collaboration (Koulopoulos and Frappaolo, 1999:103).

Although managing an organisation's knowledge is only one facet of organisational success, it is clear that knowledge-driven organisational strategies do contribute to wealth creation, especially in the long term. The European MAKE (Most Admire Knowledge Enterprises) report identifies those organisations that are leaders in creating enterprise wealth through the transformation of knowledge into world-class solutions. Siemens, British Petroleum, Unilever, Royal Dutch / Shell and ABN AMRO were the top five winners of the 2004 European MAKE study (ANON1, 2005).

2.5 Conclusion

This chapter reflected the results of a literature study focussing on knowledge, the value of knowledge in an organisation and methods to capture and share knowledge. According to the literature study tacit knowledge is the most valuable knowledge available but it is also the most difficult to capture, share or transfer.

Companies are starting to realise the importance of knowledge as an organisational asset, and therefore they need to consider ways to convert the tacit knowledge into a more explicit form and to provide an environment suitable for knowledge sharing. Various methods to capture and share knowledge were identified and discussed.

CHAPTER 3

Empirical study

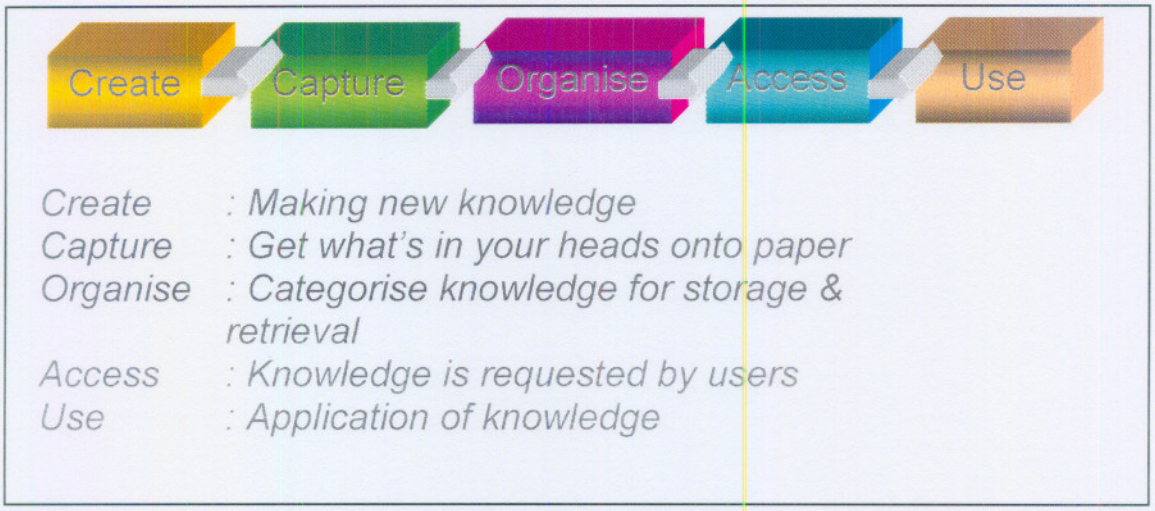
This chapter provides information on knowledge management within Sasol. The utilisation of human capital and the methods to share knowledge that was identified in the literature study will be investigated by means of a Likert-type questionnaire that would gather the respondents' opinions. The data obtained will represent a categorical scale with a response option of 1 to 5 in order to limit "neutral" responses. No pilot survey will be run.

3.1 Background

Sasol has realised the value of becoming a learning organisation. The implementation of knowledge management in Sasol originated in 1998. Diagram 3.1 reflects Sasol's knowledge management process. It consists of the following steps:

- Embark on activities that will result in new knowledge.
- Capture information in tacit and explicit form.
- Organise the information for storage and retrieval, ultimately for employees to share.
- Use this information for the best business results.

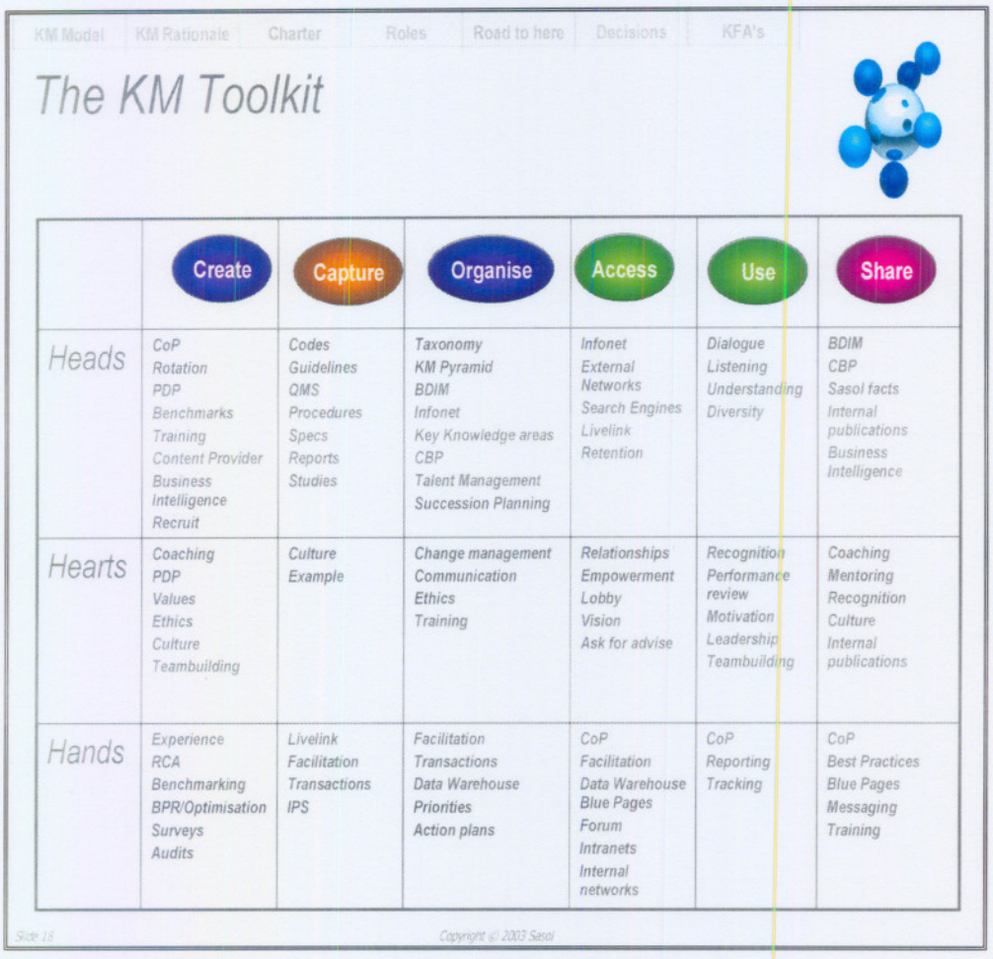
Diagram 3.1: Knowledge Management



Source: ANON1(2005)

This process is a high level process; more detail of the process could be obtained from the knowledge management toolkit that will be discussed (See diagram 3.2). In an attempt to become a learning organisation, the Sasol toolkit is implemented and sustained across the organisation and within all the different business units.

Diagram 3.2: The Knowledge Management Toolkit



Source: Hiscock (2005:27)

Hiscock (2005:27) explains the toolkit as follows:

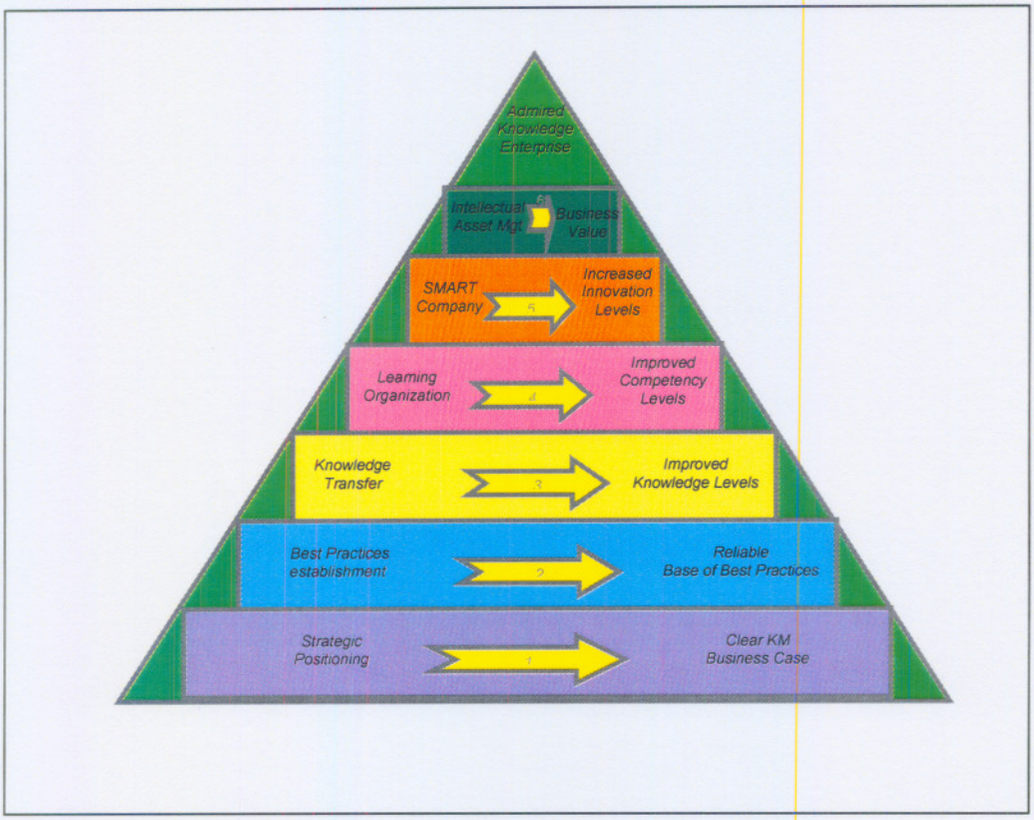
- **Heads:** Sometimes it is necessary to use one's head in order to understand what must be done, what needs to be done, what can be done and how it works together as a whole. These tools or business processes are normally part of the way organisations do business and can be seen as a purposeful

drive to achieve success and drive for competitiveness. These tools and business processes are normally already available within organisations but the emphasis should be to utilise them as a means to become faster, cheaper and better (i.e. recruitment, business intelligence, company codes and guidelines.)

- **Heart:** These tools and business processes focus on the "softer" side of business and normally require the organisation to change the culture of the organisation. It is therefore important for organisations to fully understand what culture (and also what behaviour) they are after to sustain the culture. By utilising these tools within organisations the outcome could result in putting the characteristics and elements of a learning organisation in place in order to continuously improve.
- **Hands**: "Practice makes perfect" is the theme when choosing from the hands toolkit. Sasol realised the benefit of using selected tools and processes as an opportunity to exploit the value from past learning. The challenge is to embark on a culture to fit the right skill to the right challenge across the organisation. The theory of "there is always a better and faster way to progress and execute" is embedded in the value system of Sasol. Examples of the "hands" category include personal experience, surveys, audits and best practices learning.

A core team of Knowledge Management practitioners developed The Sasol Knowledge Management Pyramid of Excellence (see diagram 3.3), also known as the Sasol Knowledge Management Maturity Model. This model is unique to Sasol and describes a framework of six stages of evolution or levels of capability and / or process maturity.

Diagram 3.3: Knowledge Management Pyramid of Excellence



Source: ANON1 (2005)

The six Levels of Maturity are (Cowley, 2003):

- **Knowledge Management Strategy (strategic positioning):** This entails the positioning and legitimisation of knowledge management as a strategic business enabler on all levels within Sasol.
- **Best practices establishment:** This level ensures that the best practices in Sasol are established. This refers to business processes best practices as well as best of class deliverables.
- **Knowledge Sharing:** This level ensures that the company's best practices are effectively transferred to as many employees as possible.

- **Learning Organisation:** This level ensures that the knowledge transferred to employees is transformed into competencies.
- **Smart Organisation:** This level ensures that the company innovates beyond the current best practices and effectively maps their competencies to customer requirements, thus achieving improved innovation levels.
- **Intellectual Capital measurement:** This level maximises Sasol's collective intellectual potential.

The Model also forms the basis for assessing and improving knowledge management practices and processes, including people, business processes and technology. It is used as a tool to capture best practices, templates, lessons learnt for reducing duplication, and to determine if the business is moving forward and obtaining the value derived from the knowledge of its people, processes and technology.

For the purpose of this study, one of the focus areas will be on the second step of the aforementioned Knowledge Management Process (diagram 3.1), namely the capturing of knowledge with an emphasis on the identification and analysis of methods to capture the tacit knowledge of the employees. One of the biggest challenges in Sasol regarding good knowledge management practices is to capture tacit knowledge and make it explicit and available for others to use.

3.2 The measuring instrument

The literature consulted identified various methods to capture tacit knowledge, including legacy pages, expert location systems, buddy systems, post-retirement agreements, identification of successors, After Action Reviews, interviews, observation, storywriting and storytelling and process mapping to name a few. For more detail on the various methods, refer to 2.3 above.
This empirical study will focus on:

- Analysis of human capital utilisation
- The identification and analysis of preferred methods, including those mentioned above, for knowledge sharing and knowledge transfer.

The questionnaire consists of both open-ended and closed-ended questions. The majority of the questions are closed-ended questions. Open-ended questions are included to provide the respondents the opportunity to make recommendations and to explain their experience with knowledge sharing, in their own words.

The first section of the questionnaire (section A) contains factual questions. These questions determine demographical information of the respondent such as gender, age, academic qualification, job level, division and department in Sasol.

Section B of the questionnaire consists of opinion-type questions that ask the respondents what they think about something. Knowledge management is usually evaluated by senior management. The heart of this study is on the employees' view on knowledge management and specifically on knowledge sharing. The target group is thus all employees and not only senior management and knowledge workers.

Permission was obtained from two of Sasol's divisions, in particular Sasol Synfuels and Sasol Wax, to distribute the questionnaire. The questionnaire (See Appendix A) was designed to obtain the following information from it:

- The employees' awareness and opinion of knowledge sharing
- The way in which Sasol utilises human capital in the two divisions
- The methods of knowledge sharing and knowledge transfer
- To establish under which conditions employees will be motivated to share knowledge.

3.3 The research sample

Three hundred and fifty five questionnaires were distributed. Forty questionnaires were received back- 22 from Sasol Wax and 18 from Sasol Synfuels. The response rate is thus 11.3%. Although the response rate is low, the sample obtained had a good distribution, except for the race distribution. The research sample consisted of 26 men and 14 women of which 35 are white, 2 are black, 1 is coloured and 2 are Asians.

The age composition of respondents was as follows:

<20:	0
20 – 29:	6
30 – 39:	13
40 – 49:	14
50 – 55:	5
56 – 59:	2
>60:	0

The qualifications of respondents from the sample were:

Matric:	13
Undergraduate degree:	11
Postgraduate degree:	12
Diploma:	3
Unknown:	1

The level of employment varies from:

Junior:	4
Skilled:	8
Senior:	14
Management:	12
Unknown:	2

The sample included the following divisions:

- Logistics and supply chain: 7
- Financial: 6
- Research and Development (R&D): 5
- Marketing: 5
- Production: 4
- SHERQ: 3
- Human Resources: 3
- Technical: 3
- New Business Development (NBD): 2
- Training: 1
- Unknown: 1

3.4 Conclusion

The questionnaire was distributed amongst the employees in two divisions of Sasol. The research sample, although small, could be considered to be fairly representative since responses were received from all age groups, various job levels and divisions.

Sasol has implemented various processes, toolkits and models in order to assess and improve knowledge management practices and processes.

CHAPTER 4

Results analysis and interpretation

The data obtained from the questionnaires were captured per question, per individual in Microsoft Excel. The questions from Section B were divided into:

- Knowledge sharing awareness: questions 8 – 15
- Human capital utilisation: questions 20, 21 and 30
- Methods of knowledge sharing and knowledge transfer: questions 16 – 19, 22 – 29, 31 – 36

The percentage response per selection will be calculated for most of the questions, while weighted average values will be calculated on questions regarding knowledge sharing methods. Comparison of the results will provide an indication of the preference of certain methods above others. The information will also be presented in graphical format. The open-ended questions will be summarised and represented.

4.1 Knowledge sharing awareness

Questions 8 – 13 were formulated to provide an indication of the awareness of knowledge sharing amongst Sasol employees. According to question 9, 97.5% of the research sample (65% agree strongly and 32.5% agree) acknowledged the value in sharing knowledge. Half the sample (5% agree strongly and 45% agree) is in agreement that they can find the best sources of knowledge at Sasol knowledge centres, based on question 8 and 37.5% declared that they manage to find the knowledge needed, quickly (question 12).

The response on the frequency of knowledge sharing (question 10) in the various departments was as follows:

- Always: 10%
- Mostly: 25%
- Sometimes: 52.5%
- Seldom: 10%
- Never: 2.5%

This however does not correlate well with the question (question 13) whether they consider their co-workers as knowledge-sharers or knowledge-hoarders. A total of 20% considered their co-workers to be shares, 37.5% consider them to be partly sharers while 30% considered them to be partly hoarders and 2.5% considered their co-workers to be knowledge hoarders.

A hopeful sign is that the sample realises the value of knowledge sharing which could serve as an indication that they would participate should all the right processes and procedures be in place. They also perceive their co-workers to be sharers rather than hoarders; once more the impression is given that the employees are willing to share their knowledge. The fact that knowledge sharing does not occur as frequently as would be preferred, might be due to a variety of reasons such as:

- The shared knowledge does not exist.
- The employees' focus (on their work) may be too narrow. – "I know what is needed to know in order to perform my job" and nothing more or nothing less.

- Employees might be afraid that they might nullify their importance in the organisation should they share their knowledge.
- Lacking of a learning culture.

The authentic reason might come forth in one of the following analysis.

Stenmark (2000:9) states that knowledge is a valuable asset and often relates to power. This statement was tested in the questionnaire (question 11), and 85% (55% agree strongly and 30% agree) are in accord to this statement. This trend was visible in most departments except for Marketing, New Business Development and Maintenance.

This statement has two cutting edges. Firstly, should a company have a knowledge sharing culture; it could provide the company with a competitive edge and thus "power" over its rivals. Secondly, this may hinder knowledge sharing, e.g. should a person have a new idea, the person will keep this close to himself/herself until personal gain could be obtained from it e.g. a promotion or a reward for an excellent idea.

4.2 Human Capital utilisation analysis

Attending to the conditions under which people are prepared to share knowledge and act upon their knowledge is a major component of human capital management. The study yields the following conditions under which the sample is prepared to share their knowledge (question 30):

- Easy, well structured, knowledge sharing process, with no paperwork
- Sharing knowledge with someone that's interested
- Knowledge sharing is / should be a natural phenomenon

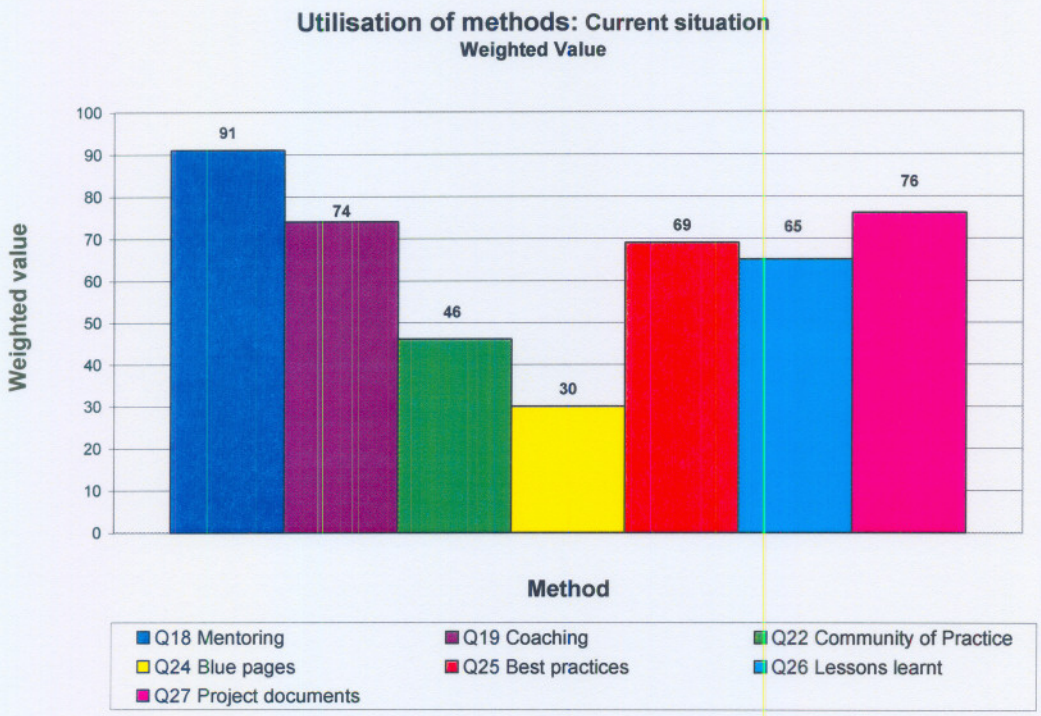
- Recognition, even a thank you, will be enough
- Acknowledgement as a senior or experience employee and acknowledgement for what the person has done, especially new ideas, procedures and information that are informative and adding value
- The satisfaction of knowing that I have helped somebody to understand and showed someone how to do something smarter and faster or if it could help the project, thus adding value
- Being able to access knowledge shared by others which adds value to my own environment
- Share knowledge if it could make work easier
- When the need for particular knowledge was identified and asked for
- Time to be able to share
- To ensure knowledge sharing and not knowledge dilution
- The exchange of knowledge, knowing what I could gain from knowledge sharing
- Growth
- More transparency in the company, including openness from management

According to question 20, the majority (62.5%) of the research sample agrees that Sasol could be considered as a learning organisation based on Garvin's (1998:51) definition stating that a learning organisation is an organisation skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insight. Question 21 indicates that 50% of the sample agrees that the company succeeds in applying knew knowledge, while 25% is unsure. This indicates that there is still room for improvement.

4.3 Methods of knowledge sharing and knowledge transfer

The utilisation of the following methods of knowledge capturing was analysed: mentoring (question 18), coaching (question 19), Communities of Practice (question 22), legacy pages (question 24), best practices (question 25), lessons learnt (question 26) and project documents (question 27). The graph below provides a weighted value of the various methods.

Graph 4.1: Utilisation of knowledge capturing methods



From the graph it is apparent that mentoring is the most utilised method and following that is project documents, coaching, best practices and lessons learnt.

Captivatingly enough is the fact that legacy pages and the Community of Practice (CoP) methods are not that frequently used.

A reason for the under-utilisation of the legacy pages might be that the legacy pages are not updated frequently enough, e.g. people get transferred or resign or retire and their contact details do not get updated. Another reason might be that not all employees have access to the intranet where the legacy pages are stored.

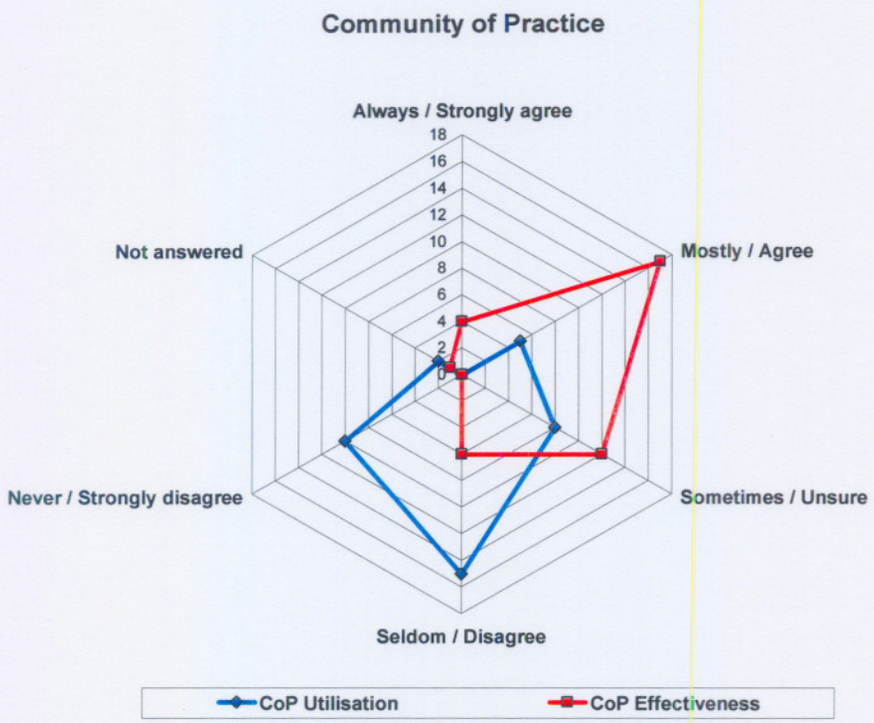
An added interesting phenomenon is that 52.5% recognise that a Community of Practice (CoP) is an effective way of transferring knowledge (question 23) but only a few (10% always and 12.5% mostly) exploit a CoP in accordance with question 22 (See graph 4.2). Once more a relatively large portion of the sample (30%) is unsure whether CoP's are an effective method for transferring knowledge. The relatively large portion that is unsure gives the impression that they do not know what a CoP is and that they never have been part of one.

The ideal would be if the two diagrams, in graph 4.2, could shadow one another, in other words, it would be ideal if the employees would utilise CoP's in the same way that they see the value that CoP could add.

The reason why the employees do not utilise CoP's could vary and further investigations should be done. A few possible reasons could be:

- Lack of time
- CoP's could be treated as another form of team, group or organisational form and therefore it could be just another meeting
- The "right" CoP's are not yet formed.

Graph 4.2: Community of Practice Effectiveness vs. utilisation

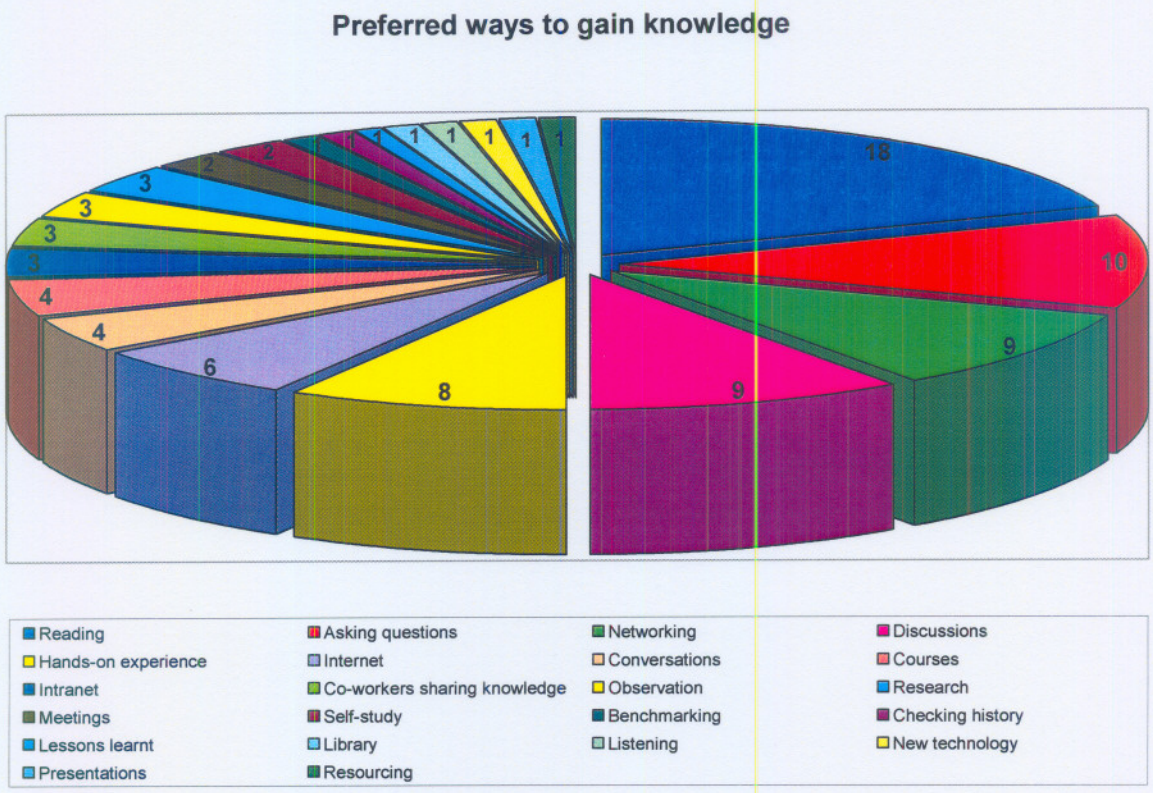


From the study (question 14) it was obvious that people prefer to gain knowledge in the following ways, in descending order, according to "votes" (Appendix B provides a detailed breakdown per division of the preferred ways to gain knowledge). This is also indicated graphically (see graph 4.3):

- Reading (18)
- Asking questions (10)
- Networking (9) and discussions (9)
- Hands-on experience (8)
- Internet (6)
- Conversations (4) and courses (4)
- Intranet (3), co-workers sharing knowledge (3), observation (3) and research (3)

- Meetings (2) and self-study (2)
- Benchmarking (1), checking history (1), lessons learnt (1), library (1), listening (1), new technology (1), presentations (1), resourcing.

Graph 4.3: Preferred ways to gain knowledge



Gaining knowledge by reading is one thing, experiencing something personally is quite another. Reading is a passive way to gain knowledge and one would have assumed that people would prefer a more active involvement such as hands-on experience. A likely explanation to this is that reading is also an independent action; the input or time of somebody else is not required. It is thus a quick way to find an answer.

As indicated in graph 4.3, asking questions received the second highest rating. Asking questions are the first step in acquiring new knowledge and it bestows a subtle way of "forcing" the other party to share his/her knowledge. The top five methods, with reading as the exception, entail interaction with other people. Once more, this proves, as stated in the literature, that face-to-face communication is the preferred way of sharing knowledge.

Other ways to share knowledge were identified (question 28). These include:

- The creation of shared folders containing relevant information which will assist in the process of knowing where to find the required knowledge.
- The scheduling of structured knowledge sharing sessions and/or discussion sessions.
    - Include shift workers in knowledge sharing sessions – make provision for these sessions during all shifts not only 08:00 – 17:00.
- Talks and / or feedback on successful projects, courses and after overseas visits which will enhance awareness of knowledge sharing and the implementation of After Action Reviews.
- Meetings and presentations are ways to share knowledge but the communication must be effective during the meetings.
- Internal seminars or user conferences for **all** levels of employment to improve information filtering to employees on lower levels.
- Well-defined and easy accessible web pages to ease the retrieval of knowledge.
- Make use of skills handovers.
- Develop a Portal page per project.
- Updated, user friendly electronic system.
- International networking to provide employees the opportunity to get acquainted with the latest technology and trends.

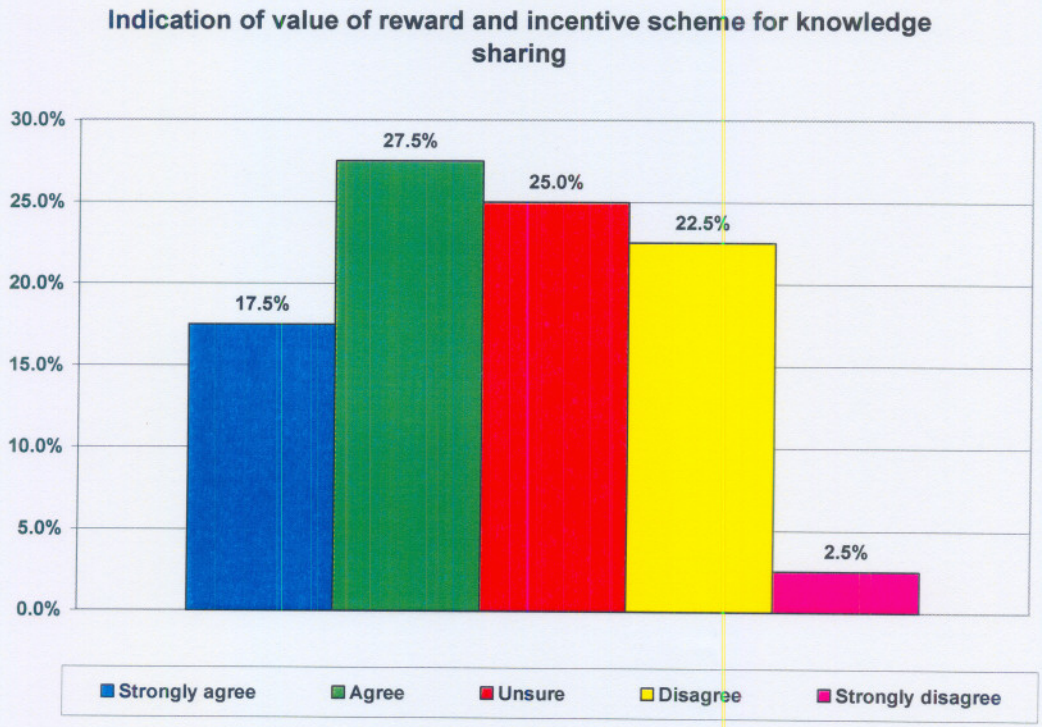
- Proper database where relevant information is stored in a specific format to make knowledge retrieval easier.
- Buddy system to provide the employees the opportunity to work in a team together with an expert. This will increase hands-on experience and thus tacit knowledge transfer.
- Customer feedback. Customers are of paramount importance to an organisation, they can provide valuable product information and feedback on service.
- Focus groups on specific subjects. By forming focus groups employees with the same interest can learn from one another.
- Include knowledge sharing as part of KPI's which will ensure that employees will share knowledge since there is an incentive to adhere to knowledge sharing
- Availability of retrieving captured knowledge after a few years: information such as project documents get store but as soon as the person who was responsible for the project resign or retire the information regarding where the documents were store also disappear.

The abovementioned list indicates that the employees do not consider the intranet, containing the legacy pages as user-friendly, easily accessible and updated. They do not know where to obtain the required information from and they do not know what a CoP is (forums, discussion groups and others). This could be explained that when a company is small it is easier to store knowledge cerebrally, share it frequently and to have it accessible readily but as the organisation become bigger, as is the case with Sasol, it becomes more difficult to connect personnel with each other. The list also indicated a need to share knowledge.

4.3.1 Rewards and recognition

Garvin (1998:70) states that knowledge is more likely to be transferred effectively when the right incentives are in place. This statement was investigated during the empirical study (question 31). The graph below (graph 4.4) leans to the left, indicating that more people agree than disagree that there is value in having a reward and incentive system for knowledge sharing.

Graph 4.4: Indication of value of rewards and incentives for knowledge sharing



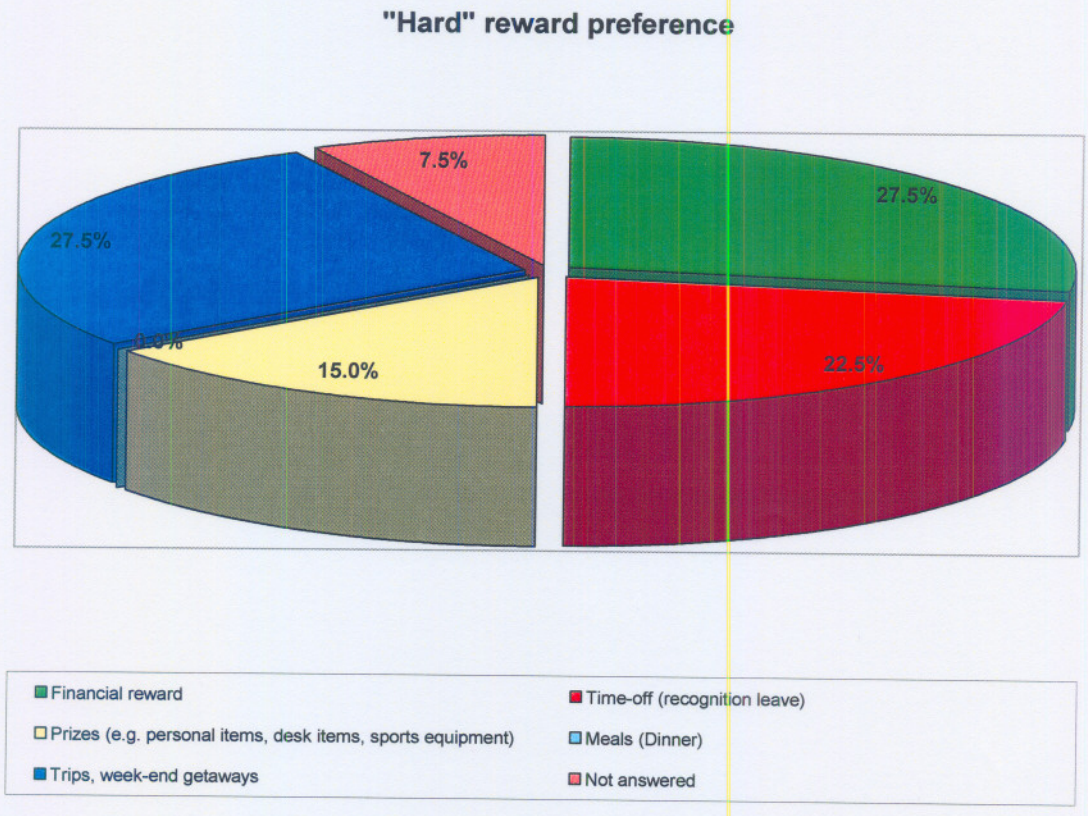
Question 32 yields an interesting phenomenon: should rewards be offered a total of 32.5% of the sample would prefer both "hard" and "soft" rewards, 30% would prefer mostly "soft" rewards while 22.5% would prefer mostly "hard" rewards; 10% preferred only "soft" and 2.5% only "hard" rewards. There's a clear

indication that the employees that participated in the questionnaire prefers "soft" rewards.

The "hard" rewards, in order of preference, according to question 33 (see graph 4.5 for a graphical illustration), were:

- Financial rewards (27.5%) and trips and / or weekend getaways (27.5%)
- Time-off ("recognition" leave – 22.5%)
- Prizes (e.g. personal items, desk items, sports equipment - 15%)
- Meals (e.g. dinners – 0%)
- 7.5% did not answer the question

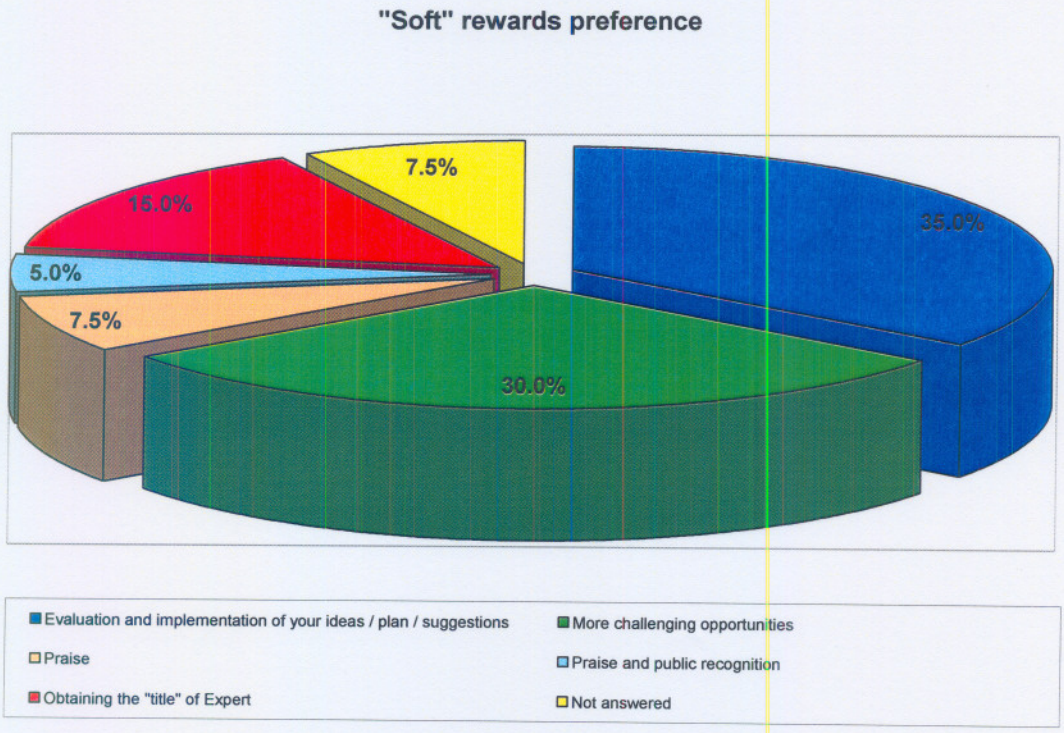
Graph 4.5: "Hard" rewards by preference



The "soft" rewards, in order of preference, according to question 34, were (see graph 4.6 for a graphical illustration):

- Evaluation and implementation of ideas (35%)
- More challenging ideas (30%)
- Obtaining the "title" of expert (15%)
- Praise (7.5%)
- Praise and public recognition (5%)
- 7.5% did not answer the question

Graph 4.6: "Soft" rewards by preference



This proves that employees are more willing to share and thus transfer knowledge when the right rewards are given. From the above it is obvious that

if employees know that their plan will be evaluated and implemented, in other words their learning will be applied, progress regarding knowledge sharing is far more likely.

Managers tend to think that rewards = money. This is not always the case; the study indicated exactly the opposite. People prefer a "soft" reward and surprisingly enough, 65% prefer a reward that could benefit the company as well, i.e. the evaluation and implementation of great ideas and more challenging opportunities. People have the tendency to live up to their expectations, should the company offer them a more challenging opportunity as a reward for sharing knowledge, the employee will grow and the company is going to reap the harvest. This leads to an ideal win-win situation.

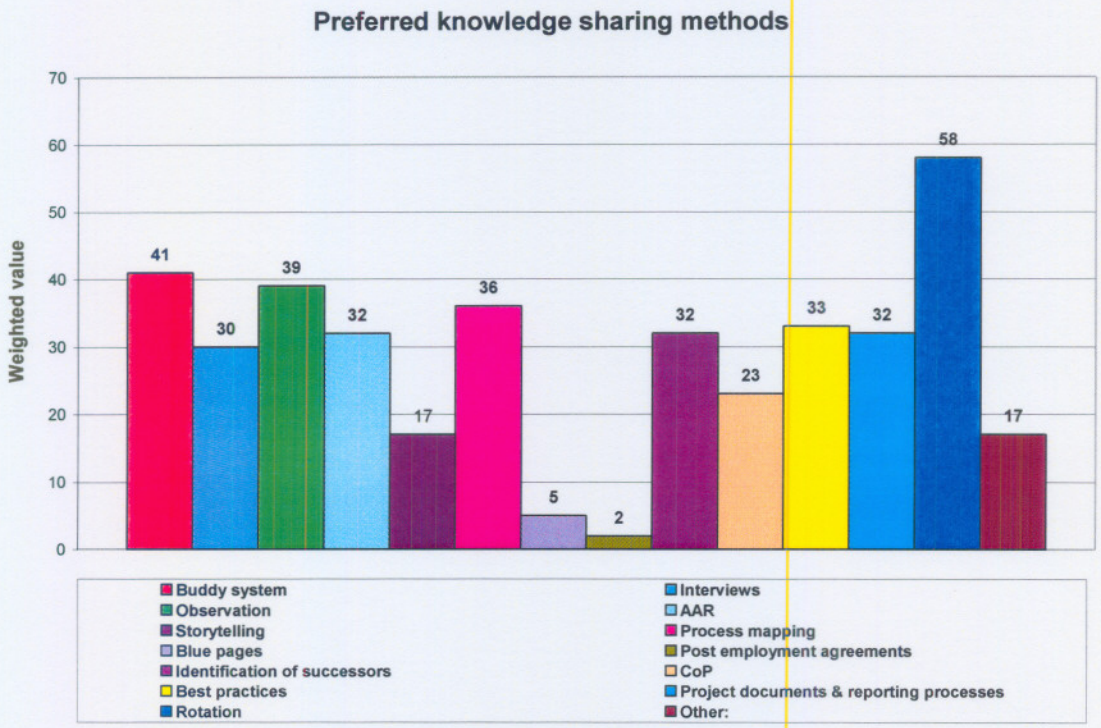
4.3.2 Preferred ways of knowledge sharing

The sample was asked to select their four preferred knowledge sharing methods from the following list: buddy system, interviews, observation, After Action Reviews (also known as learning history or lessons learnt), storywriting and storytelling, process mapping, legacy pages, post-employment agreements, identification of successors, Community of Practice (CoP), best practices, project documentation and reporting processes, and rotation. Other ways could also be specified.

Graph 4.7 provides information on the preferred methods of knowledge sharing, obtained from question 35. Rotation was by far the most preferred method. A buddy system, observations and process mapping was the respective successors. Once again, this emphasises the fact that people prefer face-to-face

communication and interaction and that they prefer to be actively involved in knowledge sharing.

Graph 4.7: Preferred knowledge sharing methods



Best practices, project documents and reporting processes, identification of successors, After Action Reviews and interviews were all very closely rated. All of these methods, except for interviews, are more passive ways to share knowledge and basically require limited interaction with other people.

Interviews could be very useful but the person conducting the interview must have the necessary required skills. Currently it is not widely known, not even internally, that Sasol is utilising interviewing as a knowledge sharing method.

This might be one of the reasons why the research sample rated interviewing low.

Best practices, project documentation and reporting processes as well as After Action Reviews (AAR) might have been rated low due to the fact that it's not clear what reports are available and where these reports are kept. It is sometimes more time-consuming to try and find project information and After Action Reviews than to call on experts. It is thus quicker to reinvent the wheel rather than digging through the archives. Another possible explanation could be that not all employees have access to these databases and / or files, as stated previously in the report.

Community of Practice (CoP) was rated lower as expected compared to the rating it received when the effectiveness of CoP's in transferring knowledge were investigated. This low rating does, however, correlate to the low current utilisation of CoP's as stated earlier.

Other methods identified include:

- Roving experts – internal consultants
- Problem solving
- Coaching and mentoring
- Training modules
- Interaction with others

Legacy pages and post-employment agreements received the lowest rating. The legacy pages' low rating could be explained in light of not up to date personal information, as stated earlier as well.

Although Sasol has many knowledge sharing and knowledge transferring methods and procedures in place already, the following knowledge sharing improvements were identified:

- Identify a central person to contact should someone require specific knowledge: this will restrict the waste of time to page through volumes of pages to find something.
- Develop a proper database and shared folders containing relevant information.
- Schedule idea generation workshops, pertaining to specific topics.
- Provide employees with more exposure to hands-on experience.
- A specific person should be appointed for capturing of information and communication with all, for session set-aside for that. Involve shift workers in these sessions; incorporate these sessions into their working hours. Don't let lack of money prevent such sessions.
- Ensure effective communication in meetings.
- Biggest problem is not the capturing of knowledge but the availability thereof after a couple of years. By then, the persons that gathered the knowledge might have left the organisation, and then it become a quest to access captured knowledge.
- Spend time to talk about successful projects.
- Develop an organised, user friendly, regularly updated electronic system.
- Schedule departmental feedback sessions after attending courses, meetings and overseas visits to share gained knowledge and interest.
- Develop easily accessed web pages and well-defined web pages.
- Include knowledge sharing in Key Performance Indicators (KPI's).

- Provide the opportunity for informal networking on key subjects - create an internal users' conference on specific subjects, topic and processes for **all** levels.
- Establish focus groups on various subjects.
- Capture customer feedback and include them in knowledge sharing sessions.
- Establish buddy systems: working in a team with an expert.
- Provide opportunities to network with international companies.
- Schedule organised session to extract knowledge from people leaving the company, e.g. exit interviews.
- Schedule structured knowledge sharing sessions within Sasol or Business Unit.
- Provide employees the opportunity to present or discuss their job to a colleague in the company in another field of work.

From both the empirical and literature study it is clear that the best way to share knowledge is two-way face-to-face communications.

4.4 Conclusion

This chapter reflected the results of the empirical study. The employees' awareness of knowledge management, focussing on knowledge sharing was determined, indicating the view of the employees towards knowledge sharing.

The conditions under which the employees are willing to share their knowledge were summarised. The utilisation of the current available method to share knowledge were compared with one another.

The methods used to capture, share and transfer knowledge were analysed and compared in order to obtain the preferred method of knowledge sharing.

CHAPTER 5

Conclusions and recommendations

This chapter will provide conclusions, linking the literature study with the empirical study. From these conclusions, recommendations will be made.

5.1 Conclusions

Allee (1997:227) states that no form of measurement is neutral. Thus, any system of measurement puts attention in one area, which sometimes is to the detriment of the whole. The challenge in any measurement system is thus to identify the measuring indicators of what the organisation wants to observe.

5.1.1 Knowledge awareness

Based on the research results it can be concluded that the sample is aware of the value of knowledge sharing and knowledge transfer, but that knowledge sharing only occurs sometimes. This lack of knowledge sharing could be explained in light of the statement made by Allee (1997:41), stating that the process of acquiring and integrating information is something we naturally know how to do but we do not take time to fully understand how this works. Employees do not apply these natural processes to the way they organise their work or businesses.

Half the research sample considered their co-workers to be knowledge sharers rather than knowledge hoarders. This is inline with the literature where Koulopoulos and Frappaolo (1999:100) state that the ideal knowledge-based world is a far cry from today's culture of knowledge hoarding. They also ask a very valid question: *what type of person would willingly give up what they know – their most valuable commodity?*

Knowledge is power. This was also the perception of the majority of the research sample. The literature (Allee; 1997:10) also refers to this as the old knowledge equation:

Knowledge = power, so hoard it.

Today, the new knowledge equation should be:

Knowledge = power, so share it and it will multiply.

With the avowal that knowledge is power, according to the research sample, one could assume that the current focus on knowledge acquisition is deeply rooted in the capitalistic concept of "ownership"; with an outlook that "more is better". Whoever utilises or controls the knowledge best will benefit the most economically from it and will gain the most power (Allee, 1997:9).

As mentioned in the results analysis and discussion, herein lies one of the greatest knowledge economy paradoxes. Allee (1997:9) explains this paradox: the knowledge possessor can sell the knowledge, trade it, or give it away and yet still have it. A day later he or she can turn around and sell it, trade it, or give it away again. In order to continue this process the person must continually renew, replenish, expand and create more knowledge. To conclude: knowledge today is also perishable; it has a limited shelf- life and can become obsolete.

Koulopoulos and Frappaolo (1999:105) state that the functions of a knowledge management solution are of no use without willing participants. In order for the knowledge base to have value, it must be used by the entire organisation. From the study it is obvious that employees are willing to give up their most valuable commodity, their knowledge, should the right incentive be in place.

At present, despite the willingness to share, there is no incentive to do so. Sharing occur if and when a co-worker asks for knowledge. Despite the creation of elaborate knowledge-based systems, virtually no one is taking the time nor making the effort to formally store their knowledge into these systems to endorse wide-scale accessibility. The reason for this is not based on a tendency to hoard, but rather a lack of reason to make this extra effort.

Employees do not see knowledge sharing as part of their formal job descriptions. They do not see management recognising it as part of the work effort, and do not feel that they get recognised for sharing knowledge. Therefore, while from a cultural and personal viewpoint employees were all willing to share what they know, in a formal capacity, it isn't happening.

The issue of receiving incentives originates from the fact that the knowledge seeker is the recipient of knowledge that will empower him or her to perform useful functions, and is thus keen to receive the knowledge. On the other hand, the knowledge provider usually sees little benefit in sharing the knowledge (Koulopoulos and Frappaolo, 1999:112-120). What incentive could be offered to the knowledge provider to encourage him or her to share their knowledge? Theoretically, the answer lies in two basic approaches: the metric approach and the method approach.

Knowledge metrics refer to how an organisation recognises that knowledge sharing has occurred while the method approach refers to the reason why the user would want to be recognised under the metric plan. Money is not always the answer. As indicated by the research, the employees might prefer a 'soft reward", e.g. evaluation and if possible, implementation of great ideas or more challenging opportunities.

5.1.2 Knowledge sharing methods

The research sample indicated that they largely make use of mentoring as method for knowledge transfer. According to Buckman (2004:230) mentors provide a useful metric for how well the organisation is doing in building leadership bench across the organisation. When the employees fully utilise mentoring as method of knowledge transferring, they would succeed in the fast-changing world around them and everybody can focus on closing the gap with the customer instead of shuffling paper. This is the beginning of building a knowledge-driven organisation.

Project documentation was also very popular; this is aligned with the literature, but despite the popularity thereof Garvin (1998:67) states that reports are a relative unwieldy way of transferring knowledge since the details that lies behind the concepts are difficult to capture in writing.

Garvin (1998:67) continues by declaring that it is very difficult to become knowledgeable in a passive way. Thus, experiencing something actively is significantly more valuable than having it described. For this reason, personnel rotation programs are one of the most powerful methods of transferring

knowledge. The research results are in agreement with Garvin since the most preferred method of knowledge sharing was identified as rotation.

Legacy pages were not popular amongst the research sample. Other companies such as British Petroleum and Texaco, to name only two, have implemented yellow pages successfully. Rumizen (2002:100) mentioned that the key to success is making participation voluntary but that a critical mass of submissions is needed to make the database worthwhile. She also states that the danger is that it must be maintained, especially the personal information. This was one of the reasons mentioned earlier why the employees do not use the Sasol blue pages.

The sample indicated that best practices are one of the methods they currently utilise and it was also identified as a method that they would prefer to exploit. The purpose of best practices is to find what is already available and to use it. It is also, as stated earlier, another dimension of finding people by connecting people with specific knowledge. The advantage is that best practices have proven their success already.

Community of Practice yielded interesting results, the people acknowledge the value of CoP's but they do not utilise it nor would they prefer to exploit it. According to Hiscock (2005:50), if CoP's are not seen within the organisation as strategically important, and linked to the overall strategy of an organisation, the value derived from these CoP's will never be recognized. Could this be the reason why the employees prefer not to exploit CoP's?

Stories are rich in meaning and memorable (Tobin, 2005:2). It is all around us and manages to capture the attention of the listeners. Although storytelling has

proven its success over the years, storywriting and storytelling were rated relatively low. The reason might lie in the difficulty in linking the workplace to stories, which people might see as myths and fables.

Process mapping, as described by Tuggle and Goldfinger (2004:4) entails the selection of the processes that's important to the organisation; these processes are then mapped and then mined for its tacit knowledge. This method was rated high on the preferred list of knowledge sharing methods. This could be linked to the fact that the organisation, and thus also the employees, should know what tacit knowledge is needed to be captured and this process leans itself toward assisting the organisation to determine exactly that.

Identification of successors were rated relatively high as one of the preferred methods for knowledge sharing but the identification of the successors will not benefit knowledge sharing as such but it is the implementation thereof, meaning the implementation of a buddy system, that will enhance knowledge transfer. Post-employment agreements and identification of successors are both methods that are closely linked to the human resource department and therefore close collaboration between the knowledge worker and human resource official is required.

The employees that participated indicated that they gain knowledge by asking questions. Once more this is in agreement with the literature. Allee (1997:230) states that questions open the world to us. She also declares that real knowledge always emerges in response to our questions and that people are most attentive and most alive between not knowing and their urge to know. A vital question, a creative question, pins attention. It can thus be concluded that questions and knowledge expand together.

Courses, training manuals and self-study were methods identified for knowledge transferring as well, but as Garvin (1998:69) mentions, these programs are powerful tools for the transferring of knowledge, but for maximum effectiveness, they must be linked explicitly to implementation.

5.2 Recommendations

In light of the empirical and literature study the following is recommended:

- Create a knowledge sharing culture within Sasol. This can be accomplished by realising the importance of creating a group within the organisation that can help people to find very self-centred reasons for sharing knowledge. The necessary incentives should be put in place.
- What gets measured gets managed. Sasol should start to measure knowledge, as indicated by the research sample. Knowledge sharing could be made part of employees Key Performance Indicators (KPI's).
- Knowledge management supports a decision-making approach, which emphasise the re-use of previous information and experience. Employees do not know where to find this information and it becomes a quest to access captured knowledge. An awareness campaign could help to eliminate this uncertainty but the database should be organised, user-friendly and updated before a road show could commence.
- The blue pages could also undergo a facelift. This can be done in conjunction with the various Human Resource Departments. All employees should be encouraged to participate but care should be taken that it does not become a troublesome session. Perhaps a template that would not take longer than 10 - 15 minutes to complete could be used. If

possible, the system could be configured to send messages to prompt employees to update their information every few months.

- A buddy system could be implemented.
- The reasons why employees do not bring CoP's into play could be investigated in order to extract the potential value out of CoP's.
- Storytelling could be implemented, with specific focus on advice and guidance from past experience.
- The study has proved that employees prefer to gain and share knowledge actively or first hand. Therefore, face-to-face communication is still the best and preferred way to transfer knowledge. For this reason, there ought to be a reason why a person would want to share his or her knowledge. Sasol could rather look at the "why" an employee would share knowledge and nurture this, than focusing on methods and systems trying to capture the tacit knowledge.

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Appendix A: Questionnaire

DETERMINING WHEN INDIVIDUALS WILL BE ENCOURAGE TO SHARE KNOWLEDGE

Purpose of the questionnaire

The following questionnaire has been created to establish under which conditions employees will be motivated to share knowledge. The researcher is conducting a survey on this topic as part of a master's study.

Confidentiality

Respondents should note that the answers provided to this questionnaire will be regarded as strictly confidential and the identities of all people who participate will remain anonymous. Identifiable data will be stored securely and all data from individual participants will be coded so that their anonymity will be protected in any reports, research papers, theses and presentations that result from this work.

Target group

The questionnaire will be distributed to a selected number of employees in the organization. In this way, the researcher will be able to obtain good feedback for the topic under investigation. Your cooperation in this matter is greatly appreciated.

Section A.

1. Gender type (Please mark appropriate box)

Male	1
Female	2

2. Age (Please indicate age in years)

3. Race (Please mark appropriate box)

White	1
Black	2
Coloured	3
Asian	4

4. Qualifications (Please mark appropriate box)

Matric/Grade12	1
Undergraduate degree(s)	2
Postgraduate degree (s)	3
Other (please specify below)	4

5. Job level (Please mark appropriate box)

Junior level	1
Skilled level	2
Senior level	3
Management level	4
Executive level	5

6. Please indicate which Sasol Division you work for, e.g. Synfuels, Mining, etc.

_____

7. Please indicate which department you work for in the company, e.g. Finance, logistics etc.

_____

Section B

Allee (1997:27) defines knowledge as experience, concepts, believes or information that can be communicated and shared. Knowledge encompasses both tacit knowledge (the knowledge which resides in workers) and explicit knowledge (codified and expressed as information in databases, documents etc.).

8. Sasol has knowledge centres where you can find the best sources of knowledge. Do you agree or disagree with this statement?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

9. There is value in knowledge sharing, do you agree?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

10. How often does knowledge sharing occur within your department?

Always	Mostly	Sometimes	Seldom	Never
1	2	3	4	5

11. *Knowledge is power.* Do you agree or disagree with this statement?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

12. How often can you find the knowledge you need, quickly?

Always	Mostly	Sometimes	Seldom	Never
1	2	3	4	5

13. Do you consider your co-workers to be predominantly knowledge-sharers or knowledge-hoarders?

Sharers	Partly sharers	Unsure	Partly hoarders	Hoarders
1	2	3	4	5

14. Think about how you absorb information and make decisions. Write down your preferred ways of gaining knowledge.

_____

_____

_____

15. Experts were identified and are encouraged to convert their tacit knowledge into explicit knowledge, do you agree or disagree?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

Organisations suffer vast intellectual capital losses due to employees emigrating, changing careers and retiring. This section will focus on ways of capturing the tacit knowledge.

16. In your opinion, would you consider reports to be an effective way of transferring knowledge?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

17. Garvin (1998:67) states that *actively experiencing something is considered more valuable than having it described.* Therefore personnel rotation programs could be considered as a powerful method to transfer knowledge. Do you agree that rotation programs can assist in knowledge transfer?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

18. Have you ever been, or made use of a mentor (someone that acts as a *counsellor, providing advise on career paths, development opportunities, and an overview of what it takes to become a leader in the company* (Tobin, 1998))whilst working for Sasol?

Yes	Unsure	No
1	3	5

19. Have you ever been, or made use of a coach (someone that acts as a *tutor, observing your work and actions, providing comments on execution, and teaching skills which may be lacking* (Tobin, 1998)) whilst working for Sasol?

Yes	Unsure	No
1	3	5

20. Garvin (1998:51) defines a learning organisation as *an organisation skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insight.* Based on the definition above, would you agree that Sasol could be considered as a learning organisation?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

21. New ideas can not by themselves create a learning organisation; it must be applied to the company's own activities and therefore translating new knowledge into new ways of behaving. In your opinion, would you agree that the company succeed in applying new knowledge?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

The capturing and / or transferring of tacit knowledge require connecting people. People can be connected in the following ways:

- Community of practice
- Blue pages
- Best practices
- Lessons-learnt
- Project documentation and reporting processes.

22. Please indicate how often you form part of a Community of practice to transfer knowledge.

Always	Mostly	Sometimes	Seldom	Never
1	2	3	4	5

23. In your opinion, would you consider a Community of practice to be effective in the transferring of knowledge?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

24. Please indicate how often you utilise the Sasol Blue pages to obtain information and / or to locate an expert.

Always	Mostly	Sometimes	Seldom	Never
1	2	3	4	5

25. Best practices in your environment were identified. Do you know where to obtain information regarding best practices?

Yes	Have an idea	Unsure	Have a vague idea	No
1	2	3	4	5

26. Lessons learnt are capture and are accessible to everyone for future reference. Do you agree or disagree with the statement?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

27. Projects are well documented and easily accessible for future reference. Do you agree or disagree?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

28. What other ways of capturing and/or transferring knowledge could you recommend?

_____

_____

_____

_____

29. Scenario: You are required to perform a certain task but you do not have the necessary experience. You decide to call on an expert, how would you go about?

_____

_____

_____

30. What would motivate you to share your knowledge?

_____

_____

_____

31. There is value in having a reward and incentive scheme for knowledge sharing. Do you agree or disagree with the statement?

Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	2	3	4	5

32. Would you prefer to receive a "hard reward" (i.e. money, time-off, prizes, etc) or would you be content receiving a "softer reward" like flattery, praise or the reputation of being an expert in a specific field? Which type is of most importance to you?

Only hard rewards	Mostly hard rewards but some soft rewards as well	Both	Mostly soft rewards but some hard rewards as well	Only soft rewards
1	2	3	4	5

33. Which one of the following "hard reward" would you prefer?

Financial reward	Time-off (recognition leave)	Prizes (e.g. personal items, desk items, sports equipment)	Meals (Dinner)	Trips, week-end getaways
1	2	3	4	5

34. Which one of the following "soft rewards" would you prefer?

Evaluation and implementation of your ideas / plan / suggestions	More challenging opportunities	Praise	Praise and public recognition	Obtaining the "title" of Expert
1	2	3	4	5

35. Scenario: You were identified as an expert and the company desires to capture and transfer your knowledge. Select the four (4) methods you would prefer the company to use?

	1	2	3	4
Buddy system				
Interviews				
Observation				
After Action Reviews / Learning History / Lessons-learnt				
Story writing and story telling				
Process mapping				
Blue pages (legacy pages)				
Post "employment" agreements				
Identification of successors				
Community of Practice				
Best Practices				
Project documentation and reporting processes				
Rotation				
Other: (Specify below)				

36. In your opinion, what could the company do to improve knowledge sharing?

_____

_____

_____

APPENDIX B: Preferred ways to share knowledge per division

Logistics	Marketing
• Hands-on experience (1) • Reading (2) • Interviews (2) • Discussions (5) – including talking to experts • Observation (2) • Courses (2) • Networking (1) • Internet (1) • Self-study (2)	• Hands-on experience (2) • Reading (1) • Discussions (3) • Networking (2) • Ask questions (1)
Financial	**R&D**
• Hands-on experience (2) • Sharing co-workers (1) • Reading (3) • Discussions (1) • Courses (1) • Research (2) • Questions and answers (1) • Meetings and workshops (1)	• Reading (3) • Ask experts (4) • Internet (4) • Intranet (2) • Conversations with trusted, experienced colleagues (1) • Networking with other scientists (1) • Library (1)
Production	**Technical group (including maintenance)**
• Reading (1) • Ask questions (2) • Gain knowledge by sharing knowledge (1) • Hands-on experience (1) • New technology (1) • Check history (1)	• Networking (1) • Databases (1) • Reading (2) • Hands-on experience (1)

• Conversations with older experienced co-workers (1)	
New Business Development	**HR**
• Reading (2) • Networking (2)	• Resourcing (1) • Networking (Interaction) (1) • Internet (1) • Ask questions (1) • Meetings (1) • Reading (1) • Listening (1) • Observation (1)
SHERQ	**Training and unknown**
• Reading (2) • Research findings (1) • Conversations with experts / colleagues (1) • Lessons learnt (1) • Sharing experiences (1) • Networking (1) • Benchmarking (1) • Intranet (1) • Courses (1)	• Reading (1) • Experience (1) • Presentations (1) • Ask questions (1) • Conversations with co-workers (1)