

KNOWLEDGE MANAGEMENT AND RISK

a Case Study in Sasol between
2005 and 2009

by
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Master of Philosophy (Information and Knowledge Management) in
the Faculty of Arts and Social Sciences
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OPSOMMING

Hierdie navorsing ondersoek die begrip Kennisbestuur (KM) in organisasies en die integrasie daarvan in ander strukture. KM word beskou as voordelig vir organisasies, maar dit is van kernbelang vir sy voorstaanders om nie uit die oog te verloor dat dit ook nadele mag meebring nie. Daar is talle publikasies, akademies en andersins, wat beskryf hoe 'n deeglike KM inisiatief waarde kan toe voeg by 'n onderneming deur die wyse waarop dit die deel van inligting tussen bestuurders en werknemers verbeter; die risikofaktore rondom die instel van KM het egter nie naastenby dieselfde aandag geniet nie.

Sy voorstaanders kon gewoonlik nie verklaar hoe selfs 'n "deeglike" KM inisiatief rampspoedige gevolge vir 'n organisasie kan hê nie; KM, soos ander bestuursteorieë soos Totale Kwaliteitsbestuur (TQM), Heraanpassing van Sakeprosesse (BPR) en ander, kan en het misluk en die redes daarvoor moet verstaan word.

Hierdie navorsing ondersoek die risiko's en waarde-implikasies van KM en die verskillende maniere waarop hierdie risiko's beheer kan word. In besonder word die integrasie van KM met bestuursinisiatiewe soos Waardebestuur (V.M) en Risikobestuur (RM) ondersoek. Hierdie proses word as problematies beskou weens die aard van die onderlinge verwantskap tussen KM aan die een kant en V.M en RM aan die ander. Daar word betoog dat slegs wanneer organisasies hierdie onderlinge verwantskap ten volle verstaan, hulle risiko- en waardebestuur in hulle KM-inisiatiewe kan begin integreer. Daarom speel die analise van die verhouding tussen Waardebestuur en Risikobestuur as semi of ten volle geformaliseerde bestuursprosesse 'n belangrike rol in die navorsing.

Die studie ondersoek gevalle waar V.M en RM ingelyf is by die implementering van KM in die Suid-Afrikaanse petrochemiese nywerheid ten einde 'n meer akkurate waardebeoordeling van hierdie proses te maak. Die studie stel voor dat kennisbestuur 'n bedreiging kan inhou vir enige organisasie wat nie die meegaande risiko's ewe goed as die voordele bestuur nie. As praktiese voorbeeld kyk hierdie studie na hoe kenniswerkers deur kennisbestuurders ontplooi kan word om waarde by 'n onderneming te voeg sonder om die risiko te loop dat hierdie intellektuele kapitaal verlore gaan wanneer sulke werkers byvoorbeeld deur mededingers gewerf word.

Die bevindinge opgeteken in hierdie tesis is wisselend van voorkoms. Sover dit hierdie navorsing betref is daar geen voldoende en vaartbelynde maatreëls om risiko in SASTECH, veral Risiko wat afkomstig van Kennisbestuur getref nie. Die gevolg hiervan is dat daar geen formele beheermaatreëls en hersieningsprosesse in plek gesit is vir die monitering van hierdie risiko's nie.

SUMMARY

This research studies the concept of Knowledge Management (KM) in organisations and also its integration with other structures. While KM is seen as being beneficial to organisations, it is of crucial importance for its proponents not to overlook the fact that it may also have disadvantages. There are numerous publications, both scholarly and otherwise, that describe how a well-implemented KM initiative can add value to an enterprise by improving the sharing of information between managers and employees, but the risk factors around instituting KM have not received the same attention.

Its proponents have generally inadequately explained how even a “well-implemented” KM initiative can spell disaster for an organisation; KM, like other management theories such as Total Quality Management (TQM), Business Process Re-Engineering (BPR) and others, can and have failed and there needs to be an understanding of why this happens.

This research looks at the risk and value issues that come with KM and the various ways in which these risks may be mitigated and the value retained. In particular, the integration of KM with management initiatives like Value Management (V.M) and Risk Management (RM) will be examined. This process is seen as problematic because of the nature of the interrelationship between KM on the one hand and V.M and RM on the other. It is argued that only when organisations fully understand this interrelationship, can they begin to integrate risk and Value Management into their Knowledge Management initiatives. Therefore, the analysis of the relationship between Value Management and Risk Management as semi or fully formalised management processes plays an important part in the research.

The study examines cases where V.M and RM have been incorporated in KM implementations in the South African petrochemical industry in an attempt to arrive at a more accurate assessment of this process. The study argues that Knowledge Management can pose a threat to any organisation that does not manage its attendant risks as well as it does its benefits. As an example, this research looks at how knowledge workers can be deployed by knowledge managers to add value to an enterprise without risking the loss of its intellectual capital, for instance when such workers are recruited by competitors.

The findings of this thesis are somewhat varied in nature. As far as this research is concerned there are no adequate and streamlined measures taken to analyse risk in SASTECH, particularly Risk that comes with or as a result of Knowledge Management. As a consequence there are no formalised control measures and review processes put into place for monitoring these risks.

DEDICATION

This thesis is dedicated to the following important people in my life – Nonofu (My wife), Warona, Boitumelo and Tshego (My cheerleaders) – I love you all and I hope I have made you proud.

Finally, my deepest gratitude to my parents – my father: Ke **Mohlaume** wa bo Malesela, ke Phaswana phankgedi, ke phaswa ya bo Ntaupa . . . to my mother: Ke **Mahlodi** abo ntelele golla kego llišana. Bare ngwana gaa leboge mogopo wa mmagwe, efela nna kere, kea leboga.

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TABLE OF CONTENTS

List of Figures	viii
List of Tables	viii
Abbreviations	ix
 CHAPTER 1	
Introduction and Background	1
1.1. Introduction to the issue of risk	1
1.2. Research Problem – Knowledge Management Risk Exposure	3
1.3. Hypothesis and Research Question	4
1.4. Research Delimitation	4
1.5. Expected Benefits	5
1.6. Introduction to Sasol	5
1.7. Sasol’s KM Strategy	10
1.8. Sasol’s KM management business drivers	12
1.9. Research design	13
1.10. Outline of the Study	13
 CHAPTER 2	
Research Methodology	15
2.1 Introduction	15
2.2 Research Methods used	15
2.3 Research design	16
2.3.1 Triangulation	17
2.3.2 Philosophical perspectives	18
2.3.3 Qualitative research methods	19
2.3.4 Data collection techniques	20
2.3.5 Target audience	22
2.3.6 Survey method	22
2.3.7 Data analysis techniques	24
2.4 Quantitative and qualitative research	25
2.5 Ethical considerations	27

CHAPTER 3

Some Aspects of Knowledge Management	30
3.1 Introduction	30
3.2 Introduction to Knowledge	30
3.3 Defining Knowledge Management	33
3.4 The Value of Knowledge Management	38
3.5 KM and other management concepts	39
3.6 The rise of Knowledge Management	42
3.7 Information and KM	45
3.8 Intellectual Property and how it relates to KM	47
3.9 Intellectual Capital as a paradigm of value creation	49
3.10 Sasol's Intellectual Capital	50
3.11 Sasol's patent portfolio	50
3.12 SASOL's Corporate IP Strategy Matters	51
3.13 Summary	51

CHAPTER 4

The Relationship between Risk and Value Management	53
4.1. Introduction	53
4.2. Knowledge Management and the Risk principle	53
4.3. Defining Risk	55
4.4. Understanding Risk Management	57
4.5. Controlling risk in a KM environment	60
4.6. Principles of Risk Management	62
4.7. Risk Management cycle	63
4.8. Understanding Value Management	65
4.9. The Paradox of Value	70
4.10. Interrelationship of Value, Risk and KM	71
4.11. Summary	72

CHAPTER 5

Assessment and Findings	74
5.1 Introduction	74
5.2 Theme analysis	75
5.3 Knowledge Management Assessment	76

5.4	Findings	78
5.5	Objectives of the Research achieved?	83
5.6	Towards a Solution for Knowledge Risk Exposure	86
	Knowledge risk exposure: The case of Sasol	86
	Knowledge risk exposure: The proposed solution	87
5.7	Conclusion	89
	Bibliography	91
	Appendices	97
	Appendix A: KM self assessment questionnaire	97
	Appendix B: KM risk assessment questionnaire	100
	Appendix C: Knowledge Management survey questionnaire	102

List of Figures

Figure 1.1: Google search results on Knowledge Management	7
Figure 1.2: CETA Scarce and Critical Skills 2008-2009	11
Figure 1.3: Sasol Financial Earnings 2009	13
Figure 1.4: Sasol's Knowledge Management Blueprint	15
Figure 3.1: The relationship between data, information, knowledge and wisdom	40
Figure 3.2: Data, Information & Knowledge	41
Figure 3.3: The agent in the world	42
Figure 4.1: Risk Management cycle	78
Figure 4.2: Principles of Value Management	81
Figure 4.3: The value cycle	82
Figure 4.4: Value Management in a project cycle.	83
Figure 4.5: The Value Management study plan	84
Figure 4.6: Interrelationship between RM, V.M & KM	87
Figure 5.1: Findings spider plo	93
Figure 5.2: Findings chart	93
Figure 5.3: Findings summary	94

List of Tables

Table 3.1: Pollard's Knowledge Management in perspective	48
Table 4.1: Understanding Risk and Contro	74
Table 5.1: Risk Associated with Knowledge Management	95
Table 5.2: Risk of losing Intellectual Property	96
Table 5.3: Understanding Knowledge Risk	96
Table 5.4: Organisation Exposure to Knowledge risk	97
Table 5.5: Organisational Awareness	98
Table 5.6: Knowledge Workers and the Risk to the Organisation	98
Table 5.7: Management Information Systems for controlling risk	99
Table 5.8: Sasol Knowledge Management steering committee	99

Abbreviations

ALDP	-	Accelerated Leadership Development Programme
BPR	-	Business Process Re-engineering
CETA	-	Construction Education and Training Authority
CoP	-	Communities of Practice
DME	-	Department of Minerals and Energy
IC	-	Intellectual Capital
IM	-	Information management
ISO	-	International Standard Organisation
IT	-	Information Technology
JIT	-	Just In Time
KM	-	Knowledge Management
KMS	-	Knowledge Management Strategy
KRE	-	Knowledge Risk exposure
RM	-	Risk Management
SASTECH	-	Sasol Technology
SADME	-	South African Department of Minerals & Energy
TQM	-	Total Quality Management
V.M	-	Value Management
VRKM	-	Value, Risk & Knowledge Management

Chapter 1

Introduction and Background

1.1. Introduction – the Issue of Risk

This study seeks to contribute to the understanding of the complexities of knowledge management in organisations. Knowledge management is largely accepted and to some extent assumed to be potentially benefiting in organisations. Therefore the tendency in most studies has been to interrogate the positives and challenges of knowledge management (KM) in organisations after it has been partially or fully implemented. This study interrogates a different perspective. It interrogates the risk that may require attention as organizations embark on knowledge management implementation process. The use of Sasol in this study is merely to provide a case of a general problem given the complexity and the magnitude of the company.

There is a valid and important interest in how risk is a significant component of KM in the process of instituting and running KM actions and interventions in organisations. The need to understand potential risks, identifying ways and means of minimizing or even entirely removing such risks can provide better benefits. For an example, the higher the level of knowledge the more it has scarcity value and the more the risk of losing it because of knowledgeable people die out / or because it leaks out. The petro-chemical industry deals daily with this sort of knowledge.

In this thesis, the investigation of the topic is situated in the context of the petro-chemical industry in South Africa. In particular the thesis uses SASOL as a case study.

A simple search on the internet reveals the rapid uptake of Knowledge Management (KM) by petrochemical companies around the world¹. British Petroleum (BP) for example has a reputation for its commitment to KM². Companies such as Total, Shell and BP Exploration, to mention just a few, frequently send their top managers to conferences on information and

¹ i.e. Knowledge and Information Management for Oil and Gas companies in the UK. This yearly conference is attended by top management from big companies such as Total, Shell Europe, and BP etc.

² SAIC, 2010

KM as it relates to the oil and gas industry³. These conferences hold the promise of seamless knowledge transfer on systemic KM approaches and information management maturity as well as familiarising delegates with the role of KM in an enterprise's risk management. KM has taken root in South Africa, with many local multinationals⁴ buying into the trend, mainly due to their competing relationship with their international counterparts.

The same search as the one above has little information on risk as the component of Knowledge Management interventions in the petrochemical organisations. This is surprising as the nature of knowledge in the petro-chemical industry clearly falls in the high level, high intensity, and barcket of knowledge.

As far back as December 1998 research by Ernst and Young⁵ suggested that in Europe at least, risk management had not been given the priority that many would believe it deserved. After interviews with what they claim to be hundreds of senior executives it concluded that fewer than 50% of the companies surveyed had appointed a designated risk manager, that more than 25% had not effectively assessed their major business risks, while more than 30% did not have a formalised approach to identifying and registering the risks they faced.

“This is despite the fact that the focus on Risk Management and management has never been as intense as it was in the wake of many high-profile disasters, of which Barings⁶ is only the most dramatic and by no means the largest in terms of cash loss. There has since been a growing clamour for more regulation or supervision in almost all parts of the world, and the pressure on managers to report the extent of their company's risk exposure has grown. Companies listed on the London Stock Exchange are now required to include in their annual reports a statement on the extent and effectiveness of their internal control systems designed to ‘safeguard’ shareholders’ investments and the company's assets.”

There is no doubt that the petro-chemical industry operates in a highly competitive arena and it is critical to maintain competitive advantages. Most of these advantages stem from much specialised knowledge of a high level, high intensity nature. In South Africa, and perhaps in a worldwide context, it applies no more so than to SASOL, given its unique fossil-to-fuel

³ Oil & Gas IQ, 2009

⁴ In this instance oil and gas companies operating in South Africa with offices outside the country or continent are referred to.

⁵ Ernst and Young; 1998

⁶ Ernst and Young; 1998

knowledge. SASOL already has an active KM department, thereby presenting an ideal case study for this thesis.

1.2. Research Problem – Knowledge Management Risk Exposure

This thesis investigates what will be termed here *Knowledge Management Risk Exposure*.

There are three dimensions to the knowledge risk. That is:

- High level knowledge dying with the few that hold it (hence necessitating managed diffusion of such knowledge)
- High level knowledge leaking out (as a consequence of erroneous diffusion and the scarcity value of such knowledge)
- The third dimension is that knowledgeable people sometimes do not know the importance of their knowledge.

There is clearly a tension between the dimensions of risk mentioned above. That tension is how to ensure that knowledge is shared and repackaged; so as to keep it relevant and at the same time ensure that it doesn't leak to competition. There are various processes such as talent management and mentoring process that could be implemented in Sasol to address this issue. This, and how it might help, will be evaluated in the last chapter of the thesis.

There is already an abundance of KM articles, on the benefits of KM, as evidenced in Dutfield⁷ and Addulai⁸, which has been widely adopted by the South African petrochemical industry. There is however little scholarly information on knowledge-risk - Thus making it difficult to find literature that shows how even well-implemented KM can expose organisations to the risk referred to as *Knowledge Management Risk Exposure*. Instead, most of the literatures tend to focus on how to apply KM for maximum results and not on the attendant risks. The phrase “well-implemented” is understood to mean a KM environment that is working according to the best practice and as it was intended in an organisation.

This observation leads to the hypothesis of this thesis and the research question

1.3. Hypothesis and Research Question

The thesis starts from the assertion that although it is generally accepted that KM contributes greatly to organisational value creation, it is not guaranteed unless a clear understanding

⁷ Dutfield, G. 2005; Addulai, D; 2009

⁸ Du Plessis, M. 2005; Despres, C; 2009

exists of the risk exposure brought about by such KM strategies and practices. It is asserted that conventional thinking about KM does not incorporate such an understanding.

Consequently the Research Question posed in this thesis is: how to resolve, or cope, with the knowledge-risk tension as created by the two dimensions of knowledge-risk.

When KM is introduced into an enterprise, it creates both value and risk issues, therefore it is hypothesized that, *If a consistent evaluation of risk as part of the Knowledge Management process can be clearly identified in an organization, then Knowledge Management risk can be managed and contained.*

This thesis aims to show that KM has the ability to create value, but that it must be integrated into the management dynamics of the organisation to minimise the risks and maximise the value.

1.4. Research Delimitation

This research is not intended to investigate what KM is about, how it is practised and why. It is not intended as a guide to KM best practices nor is it intended as research into what works and what does not – these aspects have been exhaustively researched. A search on Google [www.google.com] and any other academic database brings up a vast amount of information on KM

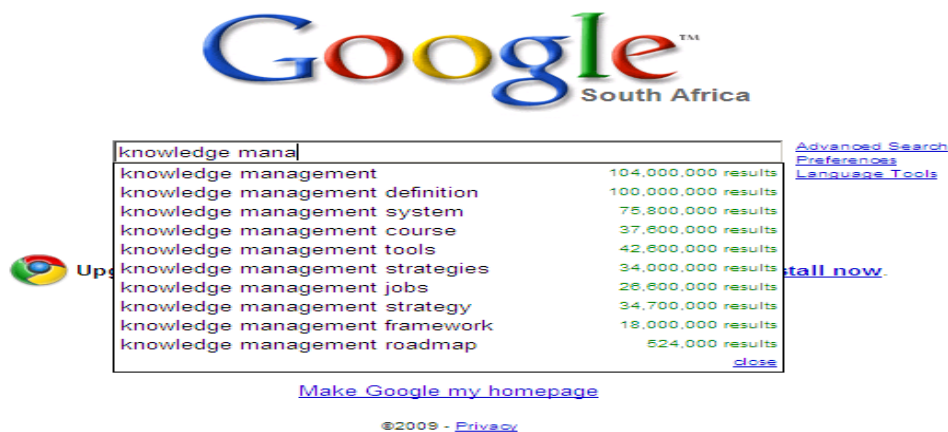


Figure 1.1: **Google search results on Knowledge Management**

Source: Google, 2008

The relationship between knowledge, value and risk management is largely absent from this material, particularly in regard to the South African petrochemical industry – it is this gap in the literature that the research wants to exploit. It is a complex relationship and only a preliminary investigation will be undertaken here to attempt to establish the more pertinent and relevant facts about it.

1.5. Expected Benefits

Risk Management is a very broad field. Attention need to be focused on the issue of risk as an element of Knowledge Management. It is hoped that this research will stimulate academic research and debate related to risk management issues specifically focusing on *knowledge-risk theory* thereby adding an important body of scholarly knowledge in the field of Knowledge Management. This will be done by providing a prototype of what a decent KM theory about knowledge-risk will comprise.

Value Management may seem as an unrelated field to the issues of knowledge and risk Management. Managing the two (KM & RM) may create more value for the organization. Value can be risky in as much as it can be useful. Scholarly research is essential to probe these interrelated issues. Regarding Sasol, this research is intended to serve as a preliminary insight into the developments in the company. It may serve to guide policy and for organization change activities. It will assist management to appreciate the complexity of the company and the organic structures that form it.

It is also envisaged that companies in other industries may be able to adopt some of the insights of this research - by so doing; the knowledge in this field will grow. This research is not intended to be conclusive. It is envisaged that it will be adopted by researchers and improved upon.

1.6. Introduction to Sasol

According to Statistics SA⁹ Sasol is the largest oil and petrochemical producer in South Africa and it is also the world's largest producer of coal-based liquid fuels. The company supplies about 41% of South Africa's liquid fuels. Sasol has business interests in the following countries: Nigeria; Mozambique, Qatar; Malaysia, Italy; Australia, China.

Information from the SA Department of Minerals and Energy (DME) suggests that Sasol's chemical interest is supported, among other things, by mining coal and converting it into synthetic fuels and chemicals through proprietary Fischer-Tropsch technology¹⁰. Sasol's larger chemical portfolio includes the divisions Solvents, Polymers and Nitrogenous Products, to mention only a few.

The DME reports that the group explores for and produces crude oil offshore in Gabon, refines crude oil into liquid fuels in South Africa, and retails liquid fuels and lubricants

⁹ SAPR, Q1; 2007

¹⁰South African Department of Minerals and Energy, 2009

locally through a growing network of Sasol Convenience Centres. Sasol also provides premium fuels, such as jet fuel and lubricants, to stringent aviation specifications. Sasol is also a signatory to Responsible Care, a worldwide initiative that strives to improve performance in safety, health and the environment.

a) Sasol's Corporate Structure

Sasol Limited is comprised of the following key operating companies listed on the company website¹¹

- Sasol Chemical Industries Ltd; Sasol Oil (Pty) Ltd
- Sasol Mining (Pty) Ltd; Sasol Gas Holdings (Pty) Ltd
- Sasol Synfuels (Pty) Ltd; Sasol Technology (Pty) Ltd, and
- Sasol Financing (Pty) Ltd.

b) Sasol – the Vision

Sasol describes itself as a competitive company that is driven to excel¹². Its stated intention is to generate sustainable growth for its stakeholders while becoming a respected global enterprise in the process. It believes that this will be achieved through its clear competitive advantage over its peers in the following fields:

- Coal; Oil
- Fuels; Chemicals and related markets.

In their own words, the company says that they capitalise on their ability to develop, enhance and apply technologies for the production and marketing of competitive products and services. Sasol strive to be the preferred supplier to customers through the delivery of quality products and superior service as well as to develop mutually beneficial relationships with suppliers. The company claims to continuously seek out new business opportunities, including synergistic alliances.

Sasol says it has created an environment where teams of dedicated people, characterised by their diversity of skills and background, grow to their full potential through development, empowerment, recognition, respect and involvement in a safe and healthy working environment¹³. The company claims to respect the communities where they operate and

¹¹ Sasol Limited, 2009 www.sasol.com

¹² Sasol Limited, 2009

¹³ Sasol Limited, 2009

participate in the community's growth and that they conduct their business activities with integrity and in compliance with internationally accepted principles and practices. The company further claims that it combines the shared values of its diversity into one formidable brand, founded on the following value propositions:

- customer focus, winning with people
- safety and excellence in all they do, and
- Continuous improvement and integrity.

c) The People

Business Monitor International, Q3 2007¹⁴, reported that the SA petrochemical industry had the potential to provide 70% or more of the domestic demand for raw materials for petroleum production; in 2007 however; the industry only produced about 25% of manufacturing sales. The main reasons for this underperformance were said to be the following:

- a shortage of engineering and construction resources for large contracts
- cost overruns
- poor project delivery records
- The expense of imported plant, machinery and equipment.

Sasol is concerned about developing and optimising its skills base. Research into the skills supply in South Africa, particularly in the construction sector, shows that South Africa needed the following skills between 2008/09:

¹⁴ *Business Monitor International*; 2007

334101Occupation	Estimated Demands 2009 / 10
MANAGERS	1910
Corporate General Manager	100
Construction Project Manager	250
Contract Manager	160
Programme or Project Manager	500
Team Manager	400
Foreman	500
PROFESSIONALS	1740
Architect	350
Landscape Architect	200
Civil Engineer	200
Civil Engineer Technologist	400
Quantity Surveyor	250
Mechanical Engineering Technologist	40
Environmental Health Officer	100
Occupational Health and Safety Advisor	200
TECHNICIANS & TRADE WORKERS	3272
Architectural Draftsperson	100
Building Inspector	100
Construction Estimator	50
Civil Engineering Draftsperson	110
Civil Engineering Technician	400
Electrical Engineering Draftsperson	100
Electrical Engineering Technician	200
Mechanical Engineering Draftsperson	100
Mechanical Engineering Technician	50
Metal Casting Trades Worker	50
Fitter and Turner	250

Figure 1.2: CETA Scarce and Critical Skills 2008-2009
Source: Construction Education and Training Authority, 2009

This list is not in any way exhaustive and is only included to show just the tip of skills demand iceberg in South Africa. Engineering only makes up a portion of Sasol's activities, but this picture is very gloomy in the light of the numbers of suitably skilled people produced by South African institutions of higher learning every year and the effect of the massive retirement of skilled personnel.

In line with the increasing emphasis on empowering historically disadvantaged South Africans, Sasol awards 50% of its bursaries to black people – Africans, Coloureds and Indians. The remaining 50%, they claim, are awarded solely on the basis of academic merit, irrespective of race or gender¹⁵. Currently, 60% of Sasol's bursars are black and a further 17% are white females (Sasol Limited, 2009). Sasol claim that they remain committed to the fast-track development of high-potential employees from historically disadvantaged groups. Through the third intake of their accelerated leadership development programme (ALDP),

¹⁵ Sasol Limited, 2009

they are developing high-potential black business leaders for future leadership positions. Employee motivation seem to be taken seriously at Sasol because it claims that in order to ensure sustained productivity, safety and reliability in their mines, plants and other production sites in 20 countries, they maintain a strong complement of well-trained and motivated people¹⁶.

In conclusion, Sasol claims to have evolved a culture of lifelong learning and encourage employees to maintain personal career development programmes based on continuous learning and development. During the four financial years to June 2005, they claim to have invested more than R530 million in employee development and training. The company has sponsored more than 1 000 undergraduate bursaries over the last 10 years. Most of these bursaries went to young people studying full-time towards a bachelor degree in science, engineering, geology, metallurgy and commerce, as a company policy dictates.

d) Highlights - Financial

This information is used as an illustration of the general standing of Sasol in monetary terms as at the end of June 2008 and was obtained the Sasol website.

This performance was reported as having been achieved in a deteriorating financial climate:

- Operating profit up 53% to R21,5 billion
- Headline earnings per share up 51% to R21,92
- Oil hedge cushions the impact of sharp decline in oil prices
- Strong balance sheet – gearing lower at 2%
- Overall group production volumes up
- Oryx GTL, Arya Sasol Polymers ramp up production

¹⁶ Sasol Limited, 2009

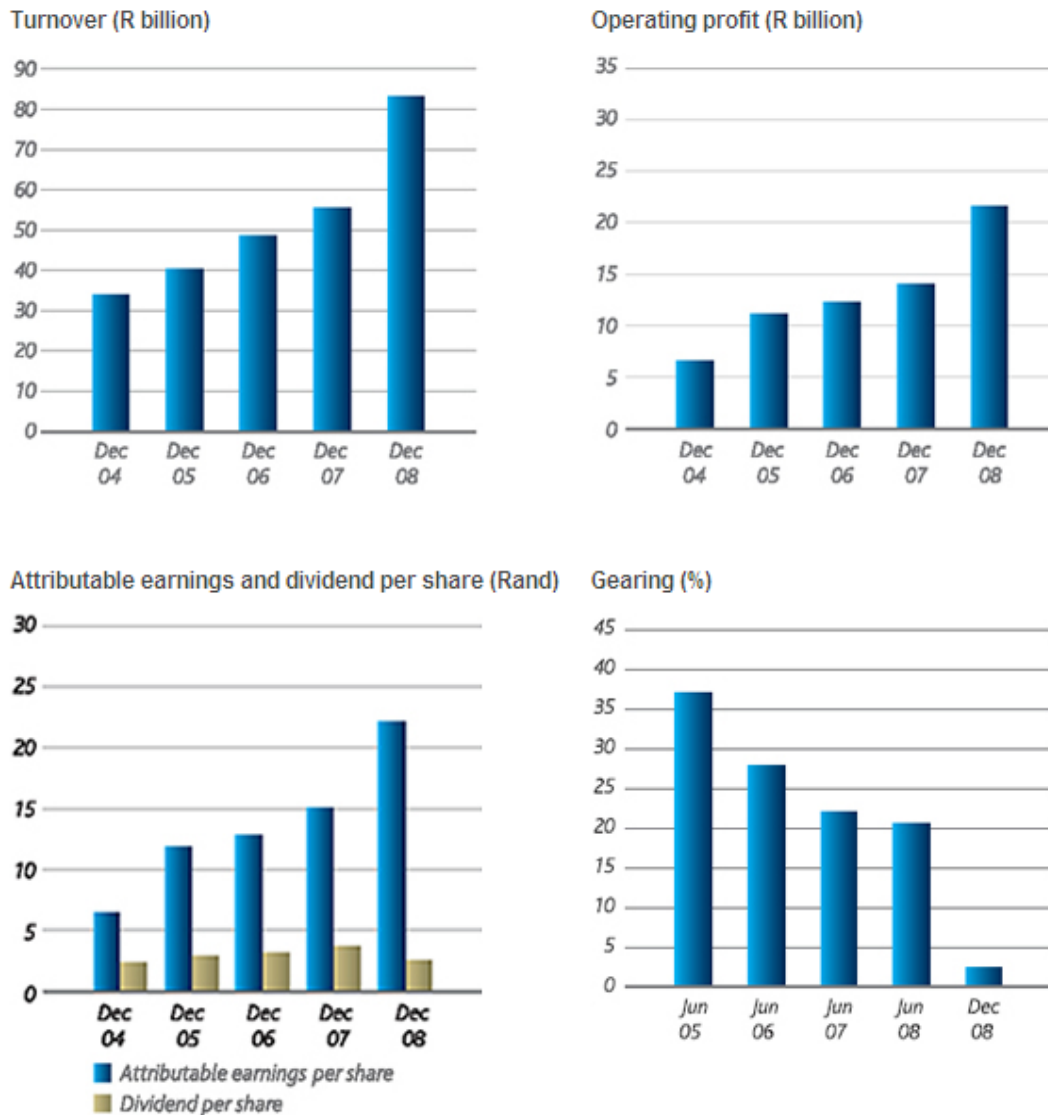


Figure 1.3: Sasol Financial Earnings 2009
Source: Sasol Intranet, 2009

1.7. Sasol's KM Strategy

Over time Sasol has grown into a respected global enterprise with world-class technology, able to compete with the best. The group's core value is "Excellence in all we do" and it intended to translate this into the way it managed its business and created profits, cared for the environment and treated its people. These factors gave the company a competitive advantage, and it was felt that it should be sustained and extended.

In 2003 Sasol embarked on a KM strategy initiative involving the whole group. At the time, the thinking inside the company was that it possessed a wealth of specialised expertise gained from the global nature of its business and it was believed that if this "amazing repository of information" (as it was referred to in the documents) could be shared with other users through

knowledge management, its potential value could be unlocked to the benefit of the whole group.

Sasol is comprised of various operations, both local and international, and there was general consensus that there were a lot of silos (information accessible to few) between these offices, but that managers and supervisors could be used to drive the process so that KM could succeed and contribute to business value.

The broad strategy for implementing KM in Sasol included:

- the training of KM champions
- the implementation of KM processes, and
- The measurement of intellectual capital, aimed at extending available information.

As shown below, SASOL took a multi-pronged KM approach, informed by:

- its business strategy
- its organisational culture
- its leadership
- its people (including CoPs), and
- Its business intelligence areas.

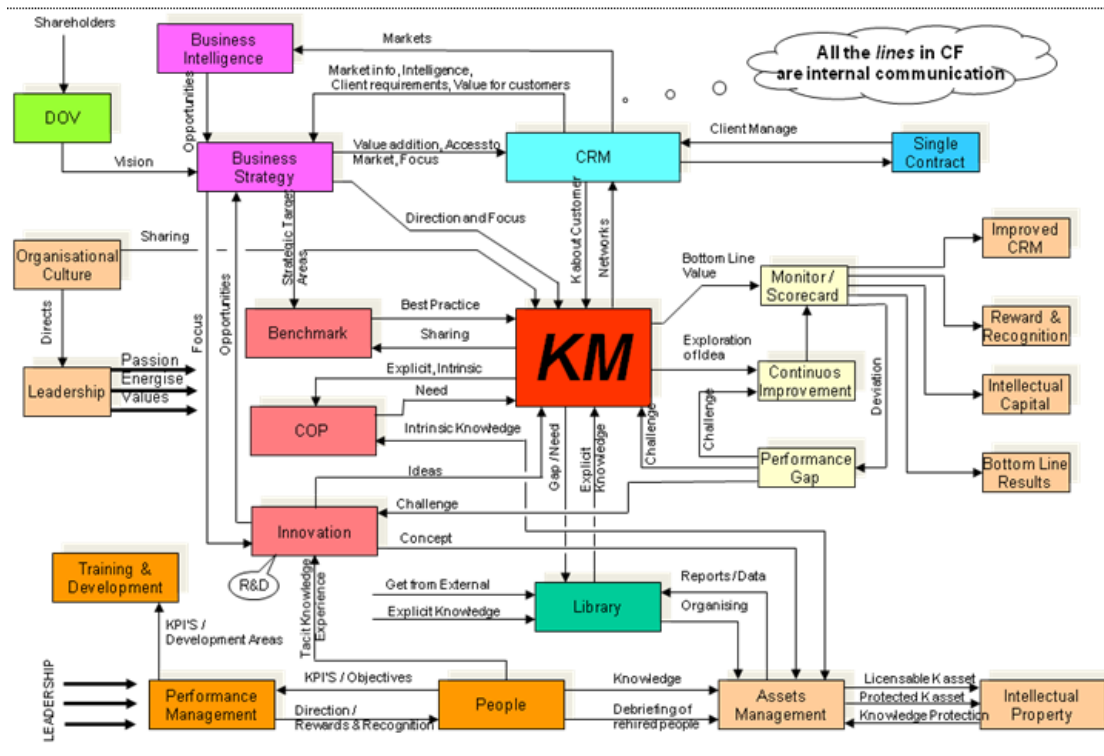


Figure 1.4: Sasol's Knowledge Management Blueprint
Source: Sasol, Knowledge Management Blueprint, 2009

The value to be contributed by a KM strategy was seen as:

- connecting people with people, identifying, capturing and sharing internal and external best practices
- sharing learning from experiences
- faster innovation
- identifying and sharing best people management practices
- rewarding and recognising performance
- measuring the value added by KM
- appropriate management of intellectual property
- strengthening customers loyalty, and
- Fostering a culture of sharing and applying knowledge.

1.8. Sasol's KM management business drivers

a) Organisational learning

Sasol operates in a knowledge-intensive business environment and hopes to ensure that it stays ahead in fuels technology and developments in the petrochemical environment. A learning organisation, such as SASTECH, actively promotes, facilitates, and rewards collective learning through promotions, incentives etc. SASTECH is a SASOL subsidiary that provides operational services such as Legal, Finance, I.T & Project Management to the Sasol group of companies.

b) The knowledge-based worker

Sasol is one of South Africa's companies with the highest concentration of PhDs. As previously mentioned, Sasol is a knowledge-intensive company – without these highly trained people the company would not be able to compete in the various businesses that it is involved in.

c) Continuous improvement and innovation

The idea of continuous improvement is a core value at Sasol. Through it, the company aim to inculcate a culture of continuous innovation and product improvement as well as the general standards according to which employees and contractors conduct their projects.

d) Corporate culture change

The nature of Sasol has changed from being a strategic semi-government “puppet” institution to a full-blown, independent multinational enterprise operating in more than ten countries and the roles and functions of its employees have changed accordingly.

e) Improved customer products and services

The company has been actively involved in introducing innovative products to the markets as well as enhancing the current product range.

f) Specific business challenges

Legislation for increased competitiveness and strict anti-corruption measures are some of the particular business challenges that the company has had to face. All the items mentioned above as business drivers have the potential for creating value for the organisation but they also carry an element of risk and this factor will be brought into perspective in the discussions about KM and Risk that follow.

1.9. Research design

This section describes methods, which have been used to obtain the necessary data to undertake this research. Data has been gathered through triangulation method. This method usually involves three or more sources to be used to arrive at a fair conclusion. This will be explained in detail in the next chapter. It will be noticed that this research uses some of the Knoco tools as instruments for gathering data. This is done to follow the triangulation guideline. It will therefore be found that an internet survey tool and interviews were also used to study Sasol.

In some instances, Open-ended questions were used, to create the opportunity for interviewees to express non-explicit personal views, thoughts, beliefs, values and attitudes.

1.10. Outline of the Study

This research project is divided into five chapters:

a) Chapter 1 – Introduction

The introduction examines KM as it relates to risk and value Management in the petrochemical industry, which, for the purposes of this study, has been contextualised in relation to Sasol only, more specifically to Sasol Technology (SASTECH).

b) Chapter 2 – Research Methodology

This chapter deals with how the research was conducted; how data was collected etc. It also shows the type of questions and questionnaires used during the time of this research.

c) Chapter 3 – Knowledge Management

In this chapter, KM is looked at from the SASTECH perspective. KM is defined in general terms and then related to SASTECH, whose KM strategy is critically discussed and analysed.

This chapter also gives a definition of intellectual capital and contextualises the definition for

the purpose of this research. The benefits of protecting the company's intellectual capital, its relationship with KM, and how companies can employ its intellectual capital are also discussed.

d) Chapter 4 – The Relationship between Risk and Value Management

Risk Management is the primary focus of this chapter: it is discussed and defined in detail and the research delves into ways in which RM should be addressed when dealing with KM issues. Sasol's RM strategy as it relates to KM is investigated and discussed.

Here the researcher also critically defines and discusses value to show how it relates to intellectual capital and KM. The value of KM risk is discussed in detail in order to show the interrelationship between value and Risk. The objectives of Value Management in a KM environment are also discussed.

e) Chapter 5 – Assessment and Findings

Systemic questions from the literature were put to selected samples of SASTECH employees. These sets of questions were then assessed by using the criteria suggested by the literature to arrive at an unbiased and objective conclusion about the objectives of this research.

Chapter 2

Research Methodology

2.1 Introduction

This chapter explains various methodologies that were used for conducting this research. It describes the philosophical perspectives used, the target group, survey methods used as well as the data collection techniques. This chapter also describes the differences between qualitative and quantitative research methodology and explains why the research tends to lean more towards the qualitative without totally disregarding the quantitative.

As this is not sponsored research, factors such as time frames, budget and data collection have had to be carefully factored in to save time and material. This chapter closes by discussing ethical principles that forms the core of this research.

2.2 Research Methods used

Triangulation method for gathering data was used in this research. This method will be explained later in the research. The first method involved an extensive literature study related to Knowledge Management, Value Management, Risk Management and a study of some Intellectual Capital. This means that the primary sources of data were gathered by studying the extant literature; books, articles from journals, other publications.

The second method is the use of case studies. This should also be described as a scientific method. This data collection technique focused on KM, V.M and RM documents. The documents consisted of policy guidelines, rules, manuals and standard procedures in Sasol.

The third method used was interviews. The interview method could also be understood as an empirical method. Structured interviews have also been conducted. Empirical data collection was conducted by means of printed questionnaires. Furthermore some data were collected through the means of conducting face-to-face interviews.

With regard to interviews, respondents were randomly selected among Sasol Technology

staff members. Some writers have referred to interviews as an excellent “window” into an organisation¹⁷. This covered about 60 individuals including senior managers and support staff. The literature also states that this method provides an insight into finding out people’s motivations, and their rationale as to why they did certain things. The inference concerning the findings of this methodology is presented in the final chapter of this research.

2.3 Research design

A research design is a detailed plan of activities for the successful execution of a research. Booth et al¹⁸ argues that without which a researcher will struggle with the project and fail to make readers understand the final report. A good research design focuses on a method and techniques that can be used for data collection without avoiding other important aspects such as ethics.

The methodology used in this research can be said to take an exploratory view, in the sense that the goal which is pursued here is the exploration of a relatively unknown research area – especially in South Africa. This approach was taken in order to gain new insights into the phenomenon, to determine priorities for future research. The study made use of interviews, a survey of some Sasol employees while the literature was investigated as well.

The approach stated above is what Booth et al¹⁹ would define as an academic research project focusing on a conceptual problem. Booth argues that a practical problem can be solved by doing something, while an academic conceptual problem is something that cannot be solved by doing something, but by finding answers to the questions and in so doing arrive at a better understanding²⁰. This argument suggests that one of the philosophical perspectives (Action research) as a qualitative research method would not constitute an academic research in the present format of this research. This could be seen as a biased view. This is however an argument for another paper especially because the methodology in question will not be utilised. It serves as a justification to the chosen method.

The research literature studied was both theoretical and analytical in nature. Theoretical (descriptive) research aims to measure a phenomenon, to find out how widespread it is, or for

¹⁷ Myers, M 2009 79

¹⁸ Booth et al; 2008 5

¹⁹ Booth et al, 2008

²⁰ Booth et al, 2008

instance how it varies across a given population whilst on the other hand Analytical research aims to go further than just documenting a phenomenon – researchers use this method to explain why a phenomenon occurs in the form it does²¹ and this study endeavour to combine the two methods in order to add more to the body of knowledge.

The best study designs use more than one research method to take advantage of their different strengths²². In this study both an analytical and a descriptive approach are taken because, as proposed by Buckingham and Saunders²³, in both these approaches that which is being looked for is usually known to exist and is recognisable – the analytical approach measures it, while the descriptive approach explains it²⁴.

Exploratory research has three interrelated aims:

- diagnosing a situation
- screening alternatives, and
- discovering new ideas²⁵.

It is intended that material published in this thesis should be representative of the many themes encountered in this triangulation (see below) type of methodology. The content of this research will thus range from the philosophical to practical/technical, as well as from the quantitative-statistical to the qualitative-interpretative approaches.

The other aspect of the approach taken was a theoretical study of the literature. In this method, extensive material on Value Management, Risk Management and Knowledge Management was perused. The other technique used to collect data was interviews – especially structured interviews. The collection of data also involved studying Sasol's standard procedures material, policy documents and financial statements that were in the public domain – this aspect will be explained in more detail below.

2.3.1 Triangulation

Triangulation is described by Myers as the concept that a subject must be approached from different angles, i.e. more than one research method should be used for the same topic, two or more techniques should be used to gather data, or both quantitative and qualitative research

²¹ Buckingham et al; 2004, 44

²² Babbie, E; 2007 110

²³ Buckingham et al; 2004, 44

²⁴ Buckingham et al; 2004, 44

²⁵ ZiK.Mund; 2003 111

methods should be combined in one study²⁶. This helps the researcher to look at the same topic from various viewpoints, and to use these varying approaches, opinions and information for defining and refining the research findings. This is what has influenced the choice of different data collection tools, including the use of the Knoco (see appendix A & B) instruments.

Regarding this research, data was gathered by the triangulation method, because it employs the strengths of different approaches for evaluation while avoiding their weaknesses. This results in a more balanced analysis of the facts. This however is a challenging technique especially if the research methods are too different in their underlying approach. This research has combined both quantitative and qualitative research methods – this can be quite challenging. For instance a researcher may want to find out “how and why do managers use risk systems” – two research methods such as (1) a statistically analysed survey, which is a Quantitative method (2) and analytic induction, which is Qualitative; could be used. Using both methods will result in quantitative data (e.g. frequency of system use) and qualitative (transcripts of risk reports). The findings could be rigorous and convincing. To add to a better understanding of this explanation, the dissimilarity of a Quantitative and Qualitative research method will be explained in detail below.

2.3.2 Philosophical perspectives

For the purpose of this research three basic philosophical perspectives will be discussed. As mentioned above, one common way to classify research methods is to make a distinction between a qualitative and a quantitative perspective²⁷. These perspectives are important in the sense that they serve as a guiding principle for what constitutes valid research. They reveal the researcher’s basic philosophical assumptions and the knowledge that informs his thinking. Qualitative or quantitative research can be based on any one of three philosophical assumptions. They are:

Positivist – Myers describes this philosophical assumption as a model that assumes that reality is objectively given²⁸; a positivist case study might use interviews and documents as the main source of data²⁹. The data analysis approach might be analytic

²⁶ Myers, M. 2009 10

²⁷ Myers, M; 2009 35

²⁸ Myers, M; 2009 37

²⁹ Myers, M; 2009 26

induction.³⁰

Interpretive – this method takes a context and focuses meaning on it; interpretive research believes that a context defines a situation and makes it what it is³¹; An interpretive action research study might use mostly interviews and participant observation (fieldwork) the data analysis approach might be semiotics and the findings written up in a thesis and subsequently published in a book³².

Critical – critical research breaks free from social constructs; it questions the status quo but in the most ethical way possible. A critical ethnography might use interviews, fieldwork, and documents. The data analysis approach might be a combination of narrative analysis and hermeneutics³³.

This report takes a critical approach. It disregards the positivist and interpretive as they will not be suitable to the study. The research is therefore a quantitative research method with a critical approach. Below are the qualitative research methods which will give further light to the chosen method.

2.3.3 Qualitative research methods

The definitions above are critical. They provide a guide to the selection of a Qualitative research method for this research. Action research, for example, is concerned with creation of organisational change and simultaneously studying the process. Other research methods are mostly seeking to study organisational phenomena but not to change them. Ethnography method is relevant to research that seeks to understand social issues such as marriage, xenophobia etc. This immediately suggests that these methods will not be suitable to this research. It is important to know the difference and highlight them. They affect the direction or philosophical assumption of this research.

Data collection technique below is guided by the Case study method. This is because Sasol Technology is an understudy of this research.

Qualitative research can be divided into three broad types:

Action research – research that aims to solve a practical problem while simultaneously expanding on scientific knowledge; it provides a good platform to

³⁰ Myers, M; 2009 26

³¹ Myers, M; 2009 37

³² Myers, M; 2009 26

³³ Myers, M; 2009 26

advance knowledge about the concept.

Case study research – case studies illustrate a particular principle or point to show that the theory is practical and brings the subject matter to life³⁴.

Ethnography – this intensive research takes a societal approach, which means people involved in purposeful systems are studied; it takes time to complete and requires the researcher's full involvement.

Grounded theory – grounded theory research in business and management is used to develop new concepts and theories of business-related phenomena, where these concepts and theories are firmly grounded on qualitative data³⁵.

Narratives and metaphor – the former is a qualitative approach to the interpretation and analysis of data involving a story with a plot; the latter is an approach to qualitative data analysis that looks at the systematic use of metaphors in a text³⁶.

Hermeneutics – this provides the philosophical grounding for interpretivism; it can also be used as a qualitative approach to the analysis of texts, focusing on meaning and human understanding³⁷.

2.3.4 Data collection techniques

Myers³⁸ argues that in the social sciences, an important distinction is made between primary and secondary sources of data. Interviews, fieldwork and unpublished minutes of meetings fall under the primary data category. The secondary sources refer to any published data gathered. These would include books, journal articles, newspapers and so forth.

An important point that Myers points out is that *primary data add richness and credibility to qualitative manuscripts*. This is due to the fact that the primary data gathered is unique to that particular research project and the author.

Various techniques for data collection are mentioned in the literature, such as fieldwork (interviews) and the use of documents (questionnaires). In this study the following methods were followed:

Interviews – There are essentially three types of interviews, each of which has its own advantages and disadvantages, but if they are all used in researching a single study, they offer

³⁴ Myers, M; 2009 70

³⁵ Myers, M; 2009 107

³⁶ Myers, M; 2009 259

³⁷ Myers, M; 2009 259

³⁸ Myers, M; 2009 122

better quality information. The three types are:

- structured
- semi-structured, and
- Unstructured.

Structured interviews are pre-formulated questions that are strictly regulated; they tend to channel the interviewee into a particular item under study. Semi-structured interviews offer the same benefits as structured interviews, but they allow a bit of leeway for asking new questions or investigating trends that might emerge during the course of the interview. Unstructured interviews offer a totally different approach to the former two approaches. They are often not limited by time, and they allow interviewees to say whatever they like. This research in the Risk of Knowledge Management in the petrochemical industry used a combination of the above three methods as part of the triangulation approach as explained above.

This also explains the use of different data gather tools which have been appended at the back pages of this research (see appendixes A, B & C). There are potential problems with interviews as noted below. This research has been careful in avoiding most of these problems. This was achieved by using different techniques.

Potential problems using interviews – this have been listed in Myers³⁹ as lack of time, lack of trust, artificiality of the interview, elite bias (whereby a researcher would only interview certain people of high status and will therefore fail to gain an understanding of the broader situation), Hawthorne effect (qualitative interviews are intrusive and can potentially change the situation), Constructing knowledge etc.

The problem with using different data collection techniques during the research process was sometimes the duplication of questions and the respondent/interviewed population feeling that they have too many forms to complete/questions to reply to. As it would later be found, this has resulted in some respondents choosing not to complete some questions of forms.

Participant observation and fieldwork – is another data collection technique where people are observed *in situ*. This means the researcher would immerse himself in the ongoing social activities of some individual or group for the purpose of the research⁴⁰.

³⁹ Myers, M; 2009 127

⁴⁰ Myers, M; 2009 137

This method could have been useful for the purpose of this research in that it enables an in-depth understanding of attitudes, beliefs, values, norms, and practices of the social group or organization being studied⁴¹. It was however not used due to lack of time and resources. It was decided that the questionnaire to be used would be designed in such a way that it would bring more in-depth results without the usual disadvantages of this method.

Using documents – this is an alternative data gathering method that was used to compliment this research. Documents such as internal WebPages and corporate records were used. They helped provide some information that allowed for a richer picture to be built than could be obtained by interviews. This information was useful in designing the questionnaire for this research.

2.3.5 Target audience

The target audience comprised senior managers (Rosebank; Sasolburg & Secunda) and staff in the Engineering Department, Project Management, Finance Management and Information Management; this included a few Knowledge Managers because they are also to be considered knowledge assets in the company; as well as in the general literature. A research survey⁴² was therefore also sent to the latter in order to garner information from them on Knowledge Management in the organisation. They as such formed the primary target audience (the selected population sample).

The company does not encourage the use of company resources and time for private research work by individuals. As this research was seen as such, the sending of e-mails to a company audience might have been seen as interfering with people's work. Because of these company restrictions the use of e-mails for data gathering was limited and some of the questionnaires were distributed manually after normal company meetings.

2.3.6 Survey method

Questionnaires are deceptively easy to construct, relatively cheap to use⁴³ and can provide an array of information, depending on their structure. A cross-sectional design questionnaire was deemed suitable for this study because it allowed for both face-to-face interviews and questionnaires. A questionnaire can be carried out at a suitable point to help provide a

⁴¹ Myers, M; 2009 150

⁴² See Appendix A: Questionnaire on Knowledge Management self assessment

⁴³ Buckingham at al; 2004, 43

snapshot of what is happening at a particular time⁴⁴. It is an explanatory tool used to describe a situation or state of being and is crucial in the sense that what the interviewer does not gather during a face-to-face interview, can be obtained from the questionnaire in writing and vice-versa.

The questionnaires used in the survey were quite wordy, which could have resulted in interviewees not completing the study. To avoid this, face-to-face interviews were used as far as possible – these are still one of the best ways of collecting good quality data, depending of course on the interviewee's understanding, the objectivity of the interviewer and the proviso that the questions are not seen as interrogative. The presence of the interviewer helps clear any misunderstandings that could otherwise leave some questions unanswered in his absence.

The sample was quite small it would therefore be beneficial to get back as much material from it as possible, hence the additional use of face-to-face interviews. As SASTECH has many business units and various departments, every effort was made to ensure that the research data gathering sample was as representative of the research population as possible.

Questionnaire design

KM self-assessment – For the purpose of this research, a KM management self-assessment tool⁴⁵ designed by a UK consulting firm, Knoco⁴⁶, was used to assess the KM status of SASTECH. The instrument was used to test if KM had been embraced by the company, in line with the overall KM strategy that was alluded to earlier in the research. The KM self-assessment questionnaire was sent by e-mail in MS (Microsoft) Excel format and the results were received anonymously.

KM management Risk calculator – The second questionnaire, also in MS (Microsoft) Excel, was used to assess KM risk factors. The questionnaire was also by Knoco and was aimed at assessing the company for management involvement. Items such as internal collaboration, performance management, team and project focus, a holistic approach, assessment and strategy were also scrutinised.

It must be stressed that this questionnaire was not a stand-alone item, but rather a supplementary to the first questionnaire mentioned above. To make things easy and avoid overwhelming interviewees, it was decided to break up these questionnaires into a shorter,

⁴⁴ Du Plessis, M. 2005

⁴⁵ Knoco; 2009 *Knowledge Management Self Assessment tool*

⁴⁶ Knoco; 2009 *Knowledge Management Risk Calculator*

more easily comprehensible tool, which is why the two Knoco questionnaires were the primary choice.

The same answering mechanism was used for the two questionnaires: the interviewees had to pick one of three colours according to how they experienced KM in the organisation: A green mark said “On track”, a yellow “Seek advice” and finally a red mark said “Stop and ask experts”.

KM survey – The third part of the questionnaire was done on-line by means of *Survey-monkey*, an on-line research questionnaire platform with which a survey can be created and sent to a selected group of people. Only 10 questions were asked in this survey, compared to the 20 questions that were asked in the previous two surveys combined.

Survey-monkey allows inexperienced researchers to create a survey easily and at little or no cost. From the website the data can also be easily analysed statistically. Access to the website is simple where there is an Internet connection. Companies such as Toyota and Universities such as Lehigh University and the University of Stellenbosch have all used this platform in order to reach researchers and students who may not be residing on campus.

For the sake of uniformity this survey was also sent to the very same people who had answered the first questionnaire. It was a multiple-question type with only one open-ended question because people generally do not like to feel as if they are answering examination questions, especially if they are not going to be rewarded for it, some people also need more time to answer open-ended questions because of the various possible interpretations of the topic under survey. The interviewees submitted their responses anonymously, which meant there were no opportunities for follow-up questions. (For more information concerning the questions asked in the survey, see Appendix C on this research.)

2.3.7 Data analysis techniques

There are numerous possible approaches to the analysis and interpretation of qualitative data. Some of the more common of these are:

- coding; critical incident; memos
- hermeneutics; analytical induction
- semiotics; event series; content analysis
- conversation analysis; discourse analysis
- narrative analysis, and
- Metaphorical analysis.

Interviews can produce considerable quantities of raw data, which create the need for a structured approach to deciphering and interpreting it. For the purposes of this research, three will be discussed: a hermeneutic, a semiotic and a narrative approach. In practice these interpretive approaches are seldom used in isolation, because they are so closely related and because they usually do not work well in isolation. Myers⁴⁷ believes that the positivist researcher might be better served with something like content analysis or analytic induction, while the interpretive researcher, would find something like hermeneutics, semiotics, or narrative analysis more appropriate⁴⁸. He adds that a critical researcher might choose discourse analysis or some form of ante-narrative⁴⁹.

2.4 Quantitative and qualitative research

The two basic types of research that are widely used both in the social and the pure sciences are the *qualitative* and *quantitative* methodologies – which will now be discussed in detail.

Academic research can be defined as an original investigation conducted with the aim of adding to the body of knowledge in a particular field. The knowledge produced is regarded as new, in the sense that the way the research was conducted is dissimilar to that used for previous research into that subject, and because the conclusions made are also somewhat different to those made before. Research in Social sciences field ideally focuses on a topic that is of relevance to the discipline [social sciences] which is very broad in nature and it may include the following: Psychology, Information management, Education strategy etc. These disciplines often build on research from other external factors and discipline such as statistics, economics etc.

A key feature of a qualitative or quantitative study, as opposed to a purely conceptual study, is that it is an empirical investigation, i.e. it relies on empirical data from the natural or social world⁵⁰. The empirical investigation seeks to contribute to the body of knowledge in a particular field⁵¹. This is also the intention of this research. The findings for this research may in future be compared with findings in other companies to find similarities and differences. This will help academics, researchers and organisations to have an informed opinion about

⁴⁷ Myers, M.D; 2009 174

⁴⁸ Myers, M.D; 2009 175

⁴⁹ Myers, M.D; 2009 175

⁵⁰ Myers, 2009 12

⁵¹ Myers, 2009 12

the Risk elements of KM

In order to answer the questions raised by the problem, the researcher subsequently uses a research method to find some empirical evidence⁵². The research method could be quantitative or qualitative and below is a comparison of the difference between the two types of research methodologies:

Sinuff et al.⁵³ differentiate quantitative and qualitative research in the following manner:

Quantitative and qualitative research have different fundamental assumptions concerning the nature of reality and how best to know it and, hence, answer different types of questions.

Qualitative research offers descriptive models of behaviour, social organisation, and social interaction that can be used to improve behaviour and experiences. It is well suited to exploratory investigations of problems about which little is known. Qualitative research may also point to previously unrecognized causal relationships that are amenable to study with quantitative methods. Furthermore, qualitative studies are useful for generating hypotheses that may later be tested by quantitative studies or for investigating explanations for some quantitative findings⁵⁴.

Mouton et al⁵⁵ argues that the *quantitative approach* may be described in general terms as that approach that is more highly formalised as well as more explicitly controlled. In terms of methods used, this would be relatively close to the physical sciences and it will have a range that is more exactly defined⁵⁶. They regard a *qualitative approach* to a social science research as those approaches in which procedures are not strictly formalised, with a scope that is more likely to be undefined and a more philosophical mode of operation being adopted⁵⁷.

The difference between the two research methods, amongst other things, is that Qualitative investigates problems in which little is unknown about them. Quantitative assumes that more is known about the problem. The two methods have to be compared because they

⁵² Myers, 2009 12

⁵³ Sinuff, 2007 104

⁵⁴ Sinuff, 2007 103

⁵⁵ Mouton, J: 1996 154

⁵⁶ Mouton, J: 1996 155

⁵⁷ Mouton, J: 1996 156

fundamentally inform the direction of this research. It is aimed to guide a reader towards understanding some of the decisions made in this research.

The same aims apply to both descriptive as well as analytical research. It must be noted that although the terms *qualitative* and *quantitative* are fairly commonly use, there is a good deal of confusion about the exact meaning of these terms⁵⁸. Mouton et al eloquently describe this when they say

*One usually finds that some authors are likely to classify all research that does not contain statistics as qualitative, while others may be more inclined to specify that research in which specific methodologies or approaches such as hermeneutics, ethnomedology and phenomenology are used must be regarded as qualitative answer, at the same time, that approaches such as positivism are quantitative by definition. The question which arises is, however, whether the terms **more** or **less** are not in essence quantitative terms when one bears in mind that the notion of ranking, as in **more** or **less**, is an integral part of the number system that we use. From this it would follow that one does not necessarily have to use numbers to have a quantitative approach. Another difficulty that complicates the identification of qualitative and quantitative approaches is the point of view that research is a process that consists of various stages or phases, and that each phase is characterised by a different type of approach. Do dyed-in-the-wool empiricists not become qualitative when, in the interpretation of their research findings, they extrapolate beyond the direct statistical analyses and data? This situation is further complicated by the fact that researchers who have not had any training in statistics sometimes behave in what may be described as a reactionary manner by condemning anything that contains any statistics whatsoever.*⁵⁹

As evident above, there are various arguments in the literature about what constitutes a balanced social sciences research project. This research will not go any further into detail as the research stance on the above has already been discussed. Below are a few philosophical perspectives that have in one way or the other informed the direction of this research.

2.5 Ethical considerations

Reliability, trustworthiness and honesty make a very important party of scholarly research.

⁵⁸ Mouton, J: 1996 155

⁵⁹ Mouton, J: 1996 155

Academic researchers have a responsibility/choice to uphold this.

Everything that is said about a research reflects our belief that it is a profoundly *social* activity that connects you both to those who will use your research and those who might benefit – or suffer – from that use⁶⁰. Booth et al further argues that it (the research) also connects the researcher and his or her readers to everyone whose research you used and beyond them to everyone whose research they used.

This means that if the research was based on untrue events – if interviews and surveys that are claimed to have taken place – if any of those have not taken place, then all future reference to this research will be unreliable. It will not represent a true reflection of the status of the society under investigation.

When a researcher reports ethically, he joins a community in search for excellence. Booth et al⁶¹ argues that when a researcher respects sources, preserve and acknowledge data that run against his results, assert claims only as warranted, acknowledge the limits only as strongly as warranted, even those of certainty, and meet all other ethical obligations in his report – then he/she earns the benefit of being a member of the scientific research society. A research investigation aimed at the best interest of others also serves the best interest of the researcher.

This research started gathering momentum in 2007. That was the time when this researcher joined Sasol. At Sasol's induction training, which usually lasts about five days; new employees are continually reminded about Sasol values. They are six in number. The two that are more relevant to this research are *Honesty & Integrity*. Honesty in everything we do. Integrity in how we conduct ourselves irrespective of where the individual is.

This research was written with an understanding that the company is very protective about its Intellectual Capital (IC) and how it is perceived in the community. Research information that is critical to the organisation's operations; that exposes company secrets will not be tolerated especially when unofficially revealed by company employees. This issue will be addressed further in chapter three, where the company's intellectual capital is discussed.

This research does not expose the company's trade secrets. It does not name the managers and people consulted to gather data for this research. The data results have all been preserved in various formats as it is ethically required from the researcher. The company is aware of it

⁶⁰ Booth, W.C et al; 2008 273

⁶¹ Booth, W.C et al; 2008 276

and they have also financially sponsored this researcher as part of employee skills development. A written authorisation was therefore not deemed necessary by the researcher.

It can be argued that research that is formally sanctioned by an organisation could have varying results to similar but unsanctioned research. It is the notion of this researcher that because people had a comfortable feeling of unanimous contribution and that this research was ethically conducted (not revealing company secrets) they were more eager to contribute as it will not affect their job security.

Even so, Booth et al⁶² argues that a researcher will face such ethical choices from the very beginning of the project. Some of the obvious *thou shalt nots* as they put it are:

- Ethical researcher does not plagiarise or claim credit for the results of others.
- They do not misreport sources; invent data, or fake results.
- They do not submit data whose accuracy they do not trust, unless they say so.
- They do not conceal objections that they cannot rebut.
- They do not caricature or distorts opposing views.
- They do not destroy data or conceal sources important for those who follow.

⁶² Booth, W.C et al; 2008 274

Chapter 3

Some Aspects of Knowledge Management

3.1 Introduction

This chapter is a brief introduction to KM, which is discussed as just one management concept amidst many others. The emergence of the idea of KM as a body of useful knowledge is briefly discussed, as is intellectual capital as a subset of KM. Among other things discussed here is the value of KM to an organisation such as Sasol, how it integrates with Sasol's intellectual capital and how the company regards its approach to a corporate intellectual property strategy.

3.2 Introduction to Knowledge

Knowledge, according to the Oxford English Dictionary, is “familiarity gained through experience of a situation or a fact”. It is also defined as “expertise gained through education or experience”. Amongst philosophers such as Plato, Nozick and Wittgenstein as well as others there is however no common definition of knowledge⁶³.

Plato, a pupil of Socrates, provided one answer to the question, which is derived from a perception that can provide a rational justification for it⁶⁴. Aristotle, a student of Plato's, approached the question by starting with appearances, working through puzzles and returning to appearances, which are easily understood by the uninitiated mind as ordinary beliefs and language. Hume, Kant, Hegel, Locke, and Descartes are other philosophers who examined theories of knowledge⁶⁵. Knowledge in an organisation holds two types of complexities as defined by Senge, i.e. detailed and dynamic complexity⁶⁶. Knowledge has also been

⁶³ Marchand, D; 2000

⁶⁴ Jashapora, 2004

⁶⁵ Jashapora, 2004

⁶⁶ Flood, R.L, 1999

described as *justified true belief*⁶⁷. People skills, judgment, experience and emotions are the assets knowledge workers express, communicate, represent and share with fellow workers and customers to achieve common business objectives and goals⁶⁸.

“It is through information about markets, customers, competitors, partners, internal operations and the mix of products and services offered by the company that managers and employees create business value and improve business performance”⁶⁹.

Of course this information cannot be adequately used if it is not converted into knowledge. Business value is seen as knowing *how*, as opposed to knowing *what*. Effective use of information is critical to how executives manage their companies and how their business creates value in their markets⁷⁰. To build up to a more authoritative model on the relationship between data, information and knowledge, the figure below by Bellinger⁷¹ will be discussed.

A knowledge worker is defined as a worker who uses intellectual ability, as opposed to physical ability, to acquire and process information for financial gain⁷². This is how Sasol Technology (SASTECH) views people i.e. as Knowledge Workers.

One of the most dominant concepts in KM literature is still the notion of “tacit” and “explicit” knowledge, which can be traced back to Ryle (1900 – 1976) and Polanyi (1891 – 1976)⁷³.

These authors argue that people need to know what value represents in an organisation so that they know when value is lost or gained. Knowing how value is created also usually gives direction to the factors that create this value. At the individual level the concept of value is critical⁷⁴. Individuals tend to ask these questions about value: “What is the value of my organisation; how is value created or contributed to and lastly, what is the value chain of my contribution?”

KM value may exist where people are able to share knowledge, thereby finding suitable answers to the above questions.

⁶⁷ Flood, R.L, 1999

⁶⁸ Marchand, 2000

⁶⁹ Marchand, 2000 4

⁷⁰ Marchand et al; 2000

⁷¹ Bellinger, 1997;

⁷² Senge, P. 1990

⁷³ Jashapora, - 2004

⁷⁴ Ungerer et al; 2006

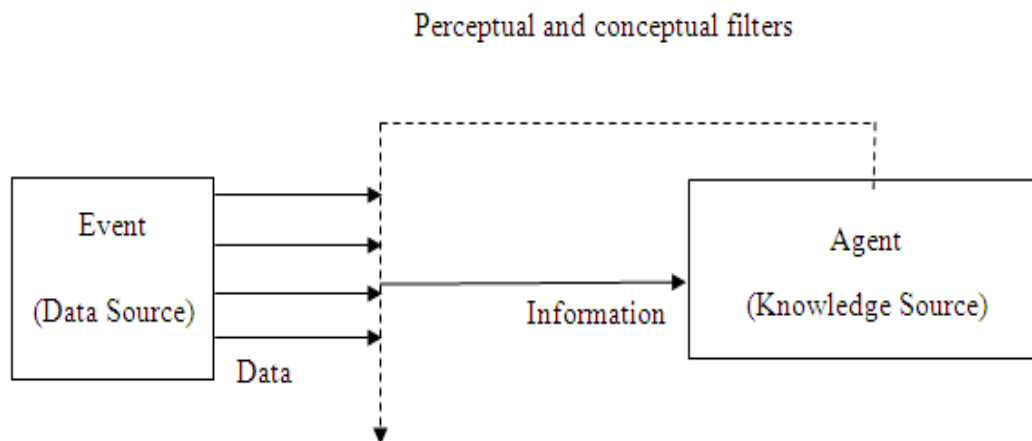


Figure 3.1: **Data, Information & Knowledge**
Source: Boisot, 1998

Boisot,⁷⁵ argues that knowledge builds on information that is extracted from data⁷⁶. He defines data as discrimination between physical states that may or may not convey information to agents⁷⁷. This also is dependent on the agent's experience, which Boisot refers to as the prior stock of knowledge⁷⁸.

Looking at figure 3.2 above, it can be seen that information is shown as existing between data and knowledge. This is what Boisot means when he says that information, in effect, establishes a relationship between things and agents⁷⁹ and that knowledge is a property of agents. According to Boisot, knowledge can be conceptualised as a set of probability distributions held by an agent that orient his or her actions⁸⁰. Boisot⁸¹ defines knowledge as the set of expectations that an observer holds with respect to an event, it cannot be observed directly, but is inferred from behaviour. He adds that this disposition to act is changed by the arrival of information that is extracted from data.

The Knowledge definition of Boisot will be used in this research as grounded theory. Combined with this will be the notion of the relationship between, data information and knowledge as used by Boisot. To further illustrate the dynamic nature of knowledge in

⁷⁵ Boisot, M 1998

⁷⁶ Boisot, M; 1998 pg 12

⁷⁷ Boisot, M; 1998 pg 12

⁷⁸ Boisot, M; 1998 pg 12

⁷⁹ Boisot, M; 1998 pg 12

⁸⁰ Boisot, M; 1998 pg 12

⁸¹ Boisot M; 1998 13

relation to information and data, Boisot et al⁸² expanded on the original Boisot model, depicted in figure 3.2, by replacing it with the one in figure 3.3 below.

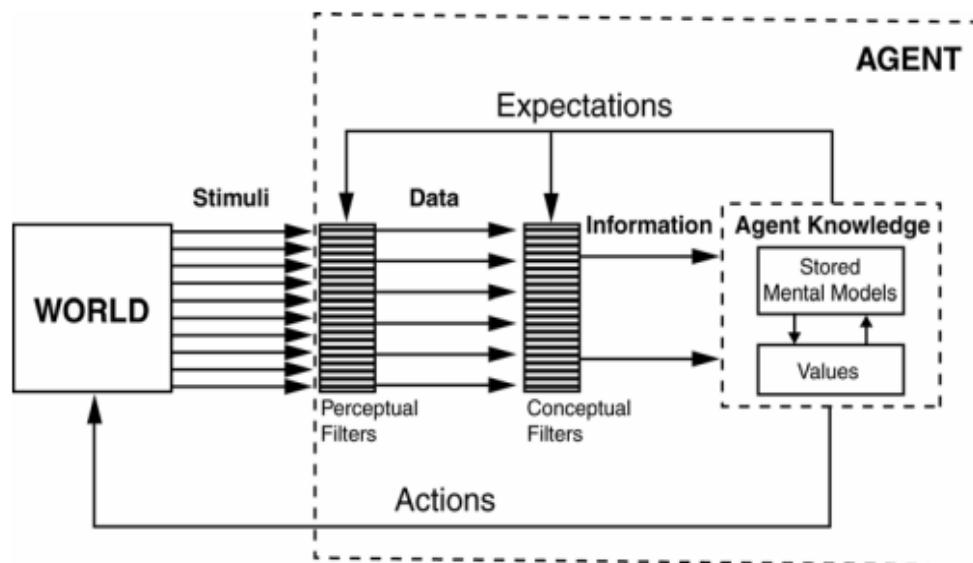


Figure 3.2: **The agent in the world**

(Source: Boisot et al, 2008)

The *World* provides stimuli when there are discernible state changes in objects within the sensory domain of the *Agent*. Perceptual filters first orient the senses to certain types of stimuli that operate within a given physical range. Only stimuli passing through this initial filter get registered as data. Conceptual filters then extract information bearing data from what has been so registered. Both perceptual and conceptual filters are functions of the knowledge agent's knowledge disposition. The information derived from the data influences or updates the knowledge agent's stored mental models and values dynamically, changing the perceptual and conceptual filters, but also causes the agent to act on the world in a certain manner.

It is this ability to act from which value is derived for the organisation. This ties in with the idea that knowledge is dynamic, but shows that the dynamism results from an interaction between information, data and knowledge.

3.3 Defining Knowledge Management

There is a lot of literature on the subject of KM and no shortage of definitions of this subject. There can however be no single definition of KM such as those found in the natural or pure

⁸² Boisot, M et al; 2008d

sciences. Rastogi⁸³ for an example, in his writings on KM and intellectual capital, describes KM as a “systemic and integrative process”. The process that Rastogi is describing is one of

“...acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups in pursuit of major organisational goals.”⁸⁴

Keyes⁸⁵ is not far off Rastogi’s mark with his definition of KM as

“...the identification and analysis of available and required knowledge, and the subsequent planning and control of actions, to develop these into ‘knowledge assets’ that will enable a business to generate profits and increase its competitive position.”

An article in the Journal of Knowledge Management & Practice⁸⁶ has compiled the following definitions of KM. The same author proceeds to say that defining what is understood by KM may be somewhat simpler than defining knowledge. He claims that as a consequence to the issues like the above in the literature, there are more ideas and definitions on Knowledge Management than just on knowledge, although these are not always clear as there are numerous terms connected with the concept. Lloria⁸⁷ quotes Quintas for the following definition of KM:

“Knowledge Management . . . is the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities.”

The above statement is to an extent true, but it is difficult to manage “knowledge of all kinds”, so this definition is not wholly applicable to this research. It is quoted because it serves as an important building block towards a definition more applicable to this research. The following definition dates from 1998, a year after the above definition by Quintas. Close scrutiny reveals that this is not a real definition rather an explanation of what KM seeks to achieve. Here Lloria⁸⁸ quotes Guns et al. as follows:

“Knowledge Management seeks to facilitate knowledge flows and sharing to

⁸³ Rastogi, 2002

⁸⁴ Rastogi, 2002

⁸⁵ Keyes, 2006

⁸⁶ Lloria, 2008

⁸⁷ Lloria, 2008

⁸⁸ Lloria, 2008

enhance the productivity of individuals and hence the enterprise.”

In 1999, Martin et al. as well as Andreu et al. took a somewhat different view to the above; they derive their KM definition from the organisation's direction or strategy. This definition is also derived from Lloira's⁸⁹ article in the *Journal of Knowledge Management and Practice* and in this instance she is quoting Martin et al:

“Knowledge Management requires understanding, firstly of the organisation's strategy under which knowledge will be developed and exploited; secondly the content and kind of knowledge; thirdly the organisational context and, finally, the technological context that supports the architecture of knowledge in the organisation.”

Another approach that could be called the Process Approach, delves into the issues of problem-solving and sustainable competitive advantage – Andreu & Sieber⁹⁰ as mentioned below, define KM as:

“. . . The process that continually ensures the development and application of all kinds of knowledge that is pertinent to a firm, with the objective of improving its problem-solving capacity and thus contributing to sustaining its competitive advantages.”

In the course of time KM definitions started to include words such as “people, processes and technology” with profit as their aim. Tsoukas is a respected author and his definition of KM is a good example of a process approach, although somewhat less explicit: (Quoted from Lloira⁹¹).

“It is the dynamic process of turning an un-reflexive practice into a reflexive one by elucidating the rules guiding the activities of the practice, by helping to give a particular shape to collective understandings, and by facilitating the emergence of heuristic knowledge.”

Below is a short explanation of what constitutes KM In this instance, KM is subdivided into three parts, and those are creation; retainment and transferring of Knowledge. What this explanation does not do, is to define that which is to be managed – and that is knowledge. It however, also serves as a building block towards a definition on KM for the purpose of this

⁸⁹ Lloria, 2008

⁹⁰ Andreu et al; 1999

⁹¹ Lloria, 2008

research. The explanation is also taken from Lloria⁹² quoting other authors and this instance; he is referring to Argote et al's definition.

Knowledge Management can be subdivided into creating or developing new knowledge, retaining the knowledge, and transferring knowledge.

The other definition, taken from the same journal as the above definitions defines Knowledge Management in some depth. Lehane⁹³ as quoted in the journal define KM as follows:

Knowledge Management refers to the systematic organisation, planning, scheduling, monitoring, and deployment of people, processes, technology and environment, with appropriate targets and feedback mechanisms, under the control of a public or private sector concern, and undertaken by such a concern, to facilitate explicitly and specifically the creation, retention, sharing, identification, acquisition, utilisation, and measurement of information and new ideas, in order to achieve strategic aims, such as improved competitiveness or improved performance, subject to financial, legal, resource, political, technical, cultural, and societal constraints.

KM seeks to create value for the organisation. The point to be noted in this definition is that KM deals with the management of Knowledge related activities. That is, KM does not manage knowledge but the knowledge related activities. This is a very useful explanation as it will be later used to justify the KM definition for the purpose of this research.

Knowledge Management 'deals with the management of knowledge related activities such as creating, organizing, sharing and using knowledge in order to create value for an organization. It is promoted as an essential cornerstone for companies to develop sustainable competitive advantage and to remain at the forefront of excellence in a level playing field market.

The statement below, as with the above definition, puts KM in the central part of business operations. This statement by Dayan & Evans⁹⁴, talks about the *promise* of KM as can be seen below.

Knowledge Management is a rather young discipline promising to maximize innovation and competitive advantage to organizations that practice knowledge

⁹² Lloria, 2008

⁹³ Lloria, 2008

⁹⁴ Lloria, 2008

capture, documentation, retrieval and reuse, creation, transfer and sharing of its knowledge assets in a measurable way, integrated in its operational and business processes

There are many definitions of KM in the literature that recognise the elements: people, processes and technology. Tsoukas⁹⁵ describes KM as an ever-changing process, which involves turning non-performers into a performing entity by setting the rules and the policies that guide workers about what is expected of them in KM – the organisation is provided with a single way of doing things in order to shape a collective understanding.

Given the above definitions, Knowledge Management will for the purpose of this research be defined in the way Keyes defines it:

“. . . the identification and analysis of available and required knowledge, and the subsequent planning and control of actions to develop these into ‘knowledge assets’ that will enable a business to generate profits and increase its competitive position.”⁹⁶

This definition refers to some integrated processes of normal management practice as well as emphasizing the *value factor* at the same time, albeit that no *risk factor* is mentioned. It is taken that risk in this case is considered to be a given constant. The premise of this thesis is that risk is a variable factor that should be constantly/continuously managed when practicing KM. This can only be done if these risk factors are visible to the management of organizations. The risk factors might differ from organizational to organizational type, therefore the research reported in this thesis will be focussed on the Petrochemical industry and any significant findings will only be applicable to this industry.

The major focus of KM, according to Keyes, is to identify and gather content from documents, reports, and other sources and to investigate that content for meaningful relationships⁹⁷. According to Pollard⁹⁸, the expectations for KM are that it will improve the following aspects of an enterprise:

- growth and innovation
- productivity and efficiency, reflected in cost savings

⁹⁵ Tsoukas et al; 2002

⁹⁶ Keyes, 2006

⁹⁷ Keyes, 2006

⁹⁸ Pollard, 2005

- customer relations
- employee learning, satisfaction and retention, and
- Management decision-making.

What	How	Why
Knowledge Management	Acquiring, creating, storing, sharing, diffusing and developing knowledge	Organisational performance Continuous improvement Competitive advantage

Table 3.1: **Pollard’s Knowledge Management in perspective**
Source: Pollard, 2007

It is claimed, by the same author (Pollard) that KM can meet these goals if it is embedded within the organisation by using what is referred to as a bottom-up, rather than the more usual top-down approach.

In the article published in the *International Journal of Information Management* of 2005, du Plessis concluded that KM is no longer just a “buzz word”. He claims that KM works and that it has been implemented in numerous firms. The only question to ask, he said, is: “What is it that makes KM so great?”⁹⁹For the purposes of this research, the definition of KM will be that of Keyes as quoted above.¹⁰⁰

3.14 The Value of Knowledge Management

KM has gained a lot of momentum in the 21st century. From the writings of Nonaka, Castells, Boisot and others, there is a general understanding that knowledge is a crucial asset and that it needs to be managed. However, as important as KM may be, it is generally difficult to measure and value anything as intangible as knowledge assets¹⁰¹. Scholars such as Chang and Ahn propose that KM can be better evaluated when one understands how knowledge impacts on performance – the performance-oriented KM approach¹⁰². Performance-oriented KM refers to factors such as innovation (both product and process innovation) and the impact of knowledge on quality and cost. According to Chang and Ahn, a

⁹⁹ du Plessis, 2005

¹⁰⁰ Keyes, 2006

¹⁰¹ Chang et al; 2008 3

¹⁰² Chang & Ahn; 2005 4

performance-oriented KM approach would involve the following four items¹⁰³:

- product knowledge
- process knowledge
- market performance, and
- Organisational performance.

KM projects involve more than just delivering a KM service to an organisation. They must reflect the long-term business needs of those who commission them and deliver the expected benefits¹⁰⁴. In a nutshell, the value of KM in an organisation is that, as previously proposed, it enhances product knowledge, process knowledge, market performance and organisational performance – like most other management concepts it can be said to be aimed at adding business value, reducing costs, managing risks and creating new realities.

KM is generally driven by the need to enhance the following facets of a business¹⁰⁵:

- intellectual asset management
- operational efficiency
- knowledge worker productivity
- customer and competitor intelligence, and
- Continuous improvement.

The value of KM does not lie in turning knowledge workers into knowledge-producing machines, but rather about creating a platform from which they can perform at an optimum level to drive business growth¹⁰⁶. As Van der Westhuizen puts it:

*“Knowledge Management is about embracing a diversity of knowledge sources, from databases, web sites, employees, and partners, and cultivating that knowledge where it resides, while capturing its context and giving it greater meaning through its relation to other information in the company.”*¹⁰⁷

3.15 KM and other management concepts

A lot of management concepts such as the ones discussed below have a very rich history of applications and theoretical arguments. Most of them however, as it will be evidenced in the

¹⁰³ Chang, 2005, 5

¹⁰⁴ Dallas, 2006 xi

¹⁰⁵ Thomas et al, 2001

¹⁰⁶ Van Der Westhuizen, 2005 10

¹⁰⁷ Van Der Westhuizen, 2005 11

arguments to follow, were oversold at certain stages. They have nonetheless made some contribution to the palette of management techniques that the managers have available.

Fink, in his article on the lifecycle approach to management fashion, raises the old argument that management concepts are usually created by academics and consultants as an ingenious way to solve the problems of the day:

*“Although it is generally not possible to assess their economic benefits, either in advance or even in retrospect, most executives rely on the reasoning and the ideas promoted in modern management concepts.”*¹⁰⁸

He further argues that in their combined efforts to promote their respective management concepts, all players pursue individual objectives, such as profit, prestige, influence, or career-related goals¹⁰⁹.

Fink argues that management concepts are usually well presented and structured in such a way that “. . . they allow managers to reduce the complexity of the decision-making process.”¹¹⁰ For this reason, management often blindly accepts these concepts and invests heavily into implementing them because of the quick benefits that they promise. Often though, these management concepts promise “one size fits all”, ready-made solutions to the problems they seek to solve, which could also be the reason why so many business process re-engineering interventions fail¹¹¹

Fink has designed a classification portfolio of management concepts and divided them as follows: base concepts, speculative concepts, pacemaker concepts, and key concepts. According to his study, KM is a pacemaker, i.e. it is a differentiating concept in the perceived cost of leadership potential. Fink articulates his argument in this fashion:

“Pacemaker concepts are also management concepts at a preliminary stage of development in terms of content, but these approaches already display a considerable amount of strategic potential in the eyes of the managers who may use them. In practice, these concepts include Knowledge Management and Customer Relationship Management, as well as eBusiness/eCommerce.

Although their rate of adoption is still relatively low, it begins to increase as a result of the high degree of perceived strategic potential

¹⁰⁸ Fink, 2003 46

¹⁰⁹ Fink, 2003 47

¹¹⁰ Fink, 2003 47

¹¹¹ Fink, 2003 48

(thematization/expansion). For fast-acting pioneers in particular, the opportunity to gain competitive advantages over a relatively large proportion of rival companies, which are not yet pursuing the respective concept, emerges at the beginning of this phase. In view of the increasing rate of adoption and perceived strategic potential, more and more consultants start to promote and improve the underlying ideas and principles."¹¹²

The costs and benefits of KM have been described as follows by Fink:

*"In principle, when a company decides to adopt a certain management concept, this decision is equivalent to an investment in the main ideas and principles embodied in the concept. Thus, the expected future discounted surpluses that result from the implementation of the concept must more than compensate the initial expenditure for such a 'management investment', should this investment comply with the requirements of economic efficiency."*¹¹³

Two management techniques that have commonly been employed in most companies are:

- Business Process Re-engineering, and
- Total Quality Management.

Well-implemented business process re-engineering (BPR) brings the promise of radically changing processes within the organisation. It is intended to do away with old, confusing and cumbersome processes and replace them with new, seamless, quick and easy systems aimed at catapulting an organisation to greater service levels and higher revenues.

Re-engineering has been defined as "the fundamental analysis and radical redesign of business processes, to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality service and speed." This definition is derived from Hummer (1990) by Kaye Loveridge¹¹⁴ in the book, *Blackwell's Encyclopaedic Dictionary of Strategic Management*.

Human beings are creatures of habit and sentiment and BPR by definition seeks to change business processes in a failing organisation by redesigning them fundamentally to improve

¹¹² Fink, 2003 57

¹¹³ Fink, 2003 48

¹¹⁴ Loveridge, K; 1997

performance. Loveridge¹¹⁵ says: “The companies are usually unsure about how the new structure will actually fit together” and argues that BPR requires a great deal of time, resources and the re-skilling of certain employees. Its financial impact is usually considerable, although mostly negative, which in most instances creates uncertainty and threatens jobs.

Marchand¹¹⁶, in his book on competing with information, alludes to the reasons why BPR so often fails. Loveridge also mentions the fact that most BPR initiatives fail because of the lack of understanding about the intricacies of the firm. Jashapora¹¹⁷ in the book *Knowledge Management: an integrated approach* also attacks BPR and quotes reasons of why it fails. He says that TQM ultimately it relies on pay incentives to enhance the positive effects of its strategy on customer and quality performance in general.

Just-in-Time and Continuous Improvement are similar techniques, geared towards providing better products at all times. There is also Shareholder Value Management (SVM) as a management concept. SVM places emphasis on making the shareholders happy and it includes highly incentivising senior managers as a reward for excellent performance and for revenue generated. High incentive comes as recognition of skills, experience, knowledge and the value that an individual is likely to add to the organisation.

Knowledge Management encourages the transfer of IP among employees. The sharing of knowledge and IP within an organisation is good in any business sense. Businesses thrive on the collective knowledge and intellect of the team. Knowledge Workers¹¹⁸ are the cream that knowledge managers must rely on for KM to succeed. The above-mentioned management strategies have all been touted as being as good as KM is purported to be, yet some of them still failed badly. It is however not concepts that fail, but their implementation. It would therefore be wise to study the research material contained in research journals, management consulting reports, books and other reliable sources to test the evidence in order to prevent failed implementations and where they do succeed, to leverage their success.

3.16 The rise of Knowledge Management

In trying to put knowledge workers into context, the management consultant and self-styled

¹¹⁵ Loveridge, 1997

¹¹⁶ Marchand, D; 2000

¹¹⁷ Jashapora, 2004

¹¹⁸ Drucker, P; 1999 50

“social ecologist”, the “father of modern management” Peter Drucker¹¹⁹, in his paper about managing knowledge workers, said that although the ancient pyramids were built by thousands of men and through intense physical labour, only a few individuals had the knowledge to build them – and these men managed the entire labour force. It was still true in the pre-industrial era and even long afterwards, that people had to perform hard physical labour for survival while owners and managers (the select few) “knew everything”.

During the Great Depression of the 1920s, people were forced to start looking at other means of survival and productivity. As Nonaka¹²⁰ put it “*In an economy where the only certainty is uncertainty, the one sure source of a lasting competitive advantage is knowledge.*” The wheels have now turned and today we have more people doing what was considered to be the job of the select few, i.e. knowledge work.

Nowadays there is a need to manage these knowledge workers just as there a need to manage physical labourers¹²¹.

The rise of KM as a field of study was fuelled by the fact that it transcends old boundaries. In this century, ideas, information as well as knowledge are mostly still contained in documents or books in every discipline, as observed by Brown¹²², and this repository needs to be preserved and re-used. Much of the thinking on Knowledge is based on the writings of two philosophers, Gilbert Ryle and Michael Polanyi¹²³.

Disciplines such as business strategy, business consulting, IT, psychology, sociology and many other disciplines have their thinking about KM informed and guided by Nonakas’ book, *Knowledge Creating Firm*. KM has been readily accepted in many institutions because of its focus on integrating technology, organisational design and processes. Part of the rapid rise is that is believed to offer some or all of the following benefits, as listed by Wiig¹²⁴:

- more, easier access to knowledge and better understanding of relevant expertise
- the potential to help in the sharing and renewal of information
- improved use of IT
- greater customer understanding

¹¹⁹ Drucker, P; 1999 51

¹²⁰ Nonaka, 1999

¹²¹ Drucker, P; 1999

¹²² Brown, 1999 xi

¹²³ Jashapora, 2004 33

¹²⁴ Wiig, K.M; 2000

- exceptional market image
- healthier profit margins
- increased viability of the firm, and
- Better community and employee relations.

The following global firms are also known to have adopted KM, which has boosted its general acceptance:

- KPMG; Hewlett-Packard; Microsoft
- IBM; BP; Xerox; 3M; Skandia, etc.

Numerous management theories have come and gone; according to Dietmar, 70% to 80% of all new concepts ultimately fail¹²⁵. Despite this, most companies still invest large sums of money into implementing these concepts¹²⁶, possibly as a result of their prior perceived success. Some of more common of these management concepts, to mention just a few, are:

- Total Quality Management and Business Process Re-engineering
- Shareholder Value Management
- Just in Time (JIT), and
- Learning Organisation.

Learning about these management concepts alongside KM is crucial as they will assist in determining if it's the flaw in the concept/theory that fails or if it's something else. Most importantly, researching about the risk/s of KM actions and interventions is crucial for a balanced academic contribution to the field of *Knowledge Management in the South African Petro-chemical industry*. These risks will be elaborated in detail as part of knowledge-risk factors below.

Prior to erecting a petrochemical plant, an environmental impact and risk assessment is conducted and the results may determine whether to build or not. With regard to KM however, it usually gets implemented long before any of the risks that this may pose to a business are investigated. Here business managers have a critical role in leading and managing knowledge managers and workers in order to add business value.

Tsoukas et al, in their paper entitled *On organisational becoming*¹²⁷ frequently mention that

¹²⁵ Dietmar, F; 2003

¹²⁶ Dietmar, F; 2003

¹²⁷ Tsoukas et al; 2002

studies about organisational change often put a lot of emphasis on the item of change itself – the state. They argue that a problem – as researchers usually call the state of change – is often not the real problem, but only a manifestation or symptom of the problem. They add that what really needs to be studied is the transition period between two points: the initial manifestation of the “problem” and its eventual resolution; only then can we gain valuable insights into some of the organisational problems.

The crux of the issue, they say, and the real problem that needs to be analysed is what contemporary philosophers refer to as the “root cause”. Tsoukas et al¹²⁸ argue that *what really exist is not things made, but things in the making. Once made, they are dead, and an infinite number of alternative conceptual decompositions can be used in defining them.* This assertion resonates well with KM management and the importance of being aware of the risks associated with it prior to and during implementation.

Knowledge management however brings with it certain risk factors which may result in organisational problems. These factors are referred to as Knowledge-risk factors and they are elaborated on below. The risk exposure in most organisations is normally reported in monetary terms. This is probably due to the fact that investors put money in the company and they are interested in fair returns of that. What most companies, including Sasol, may not realise is that they could make more by paying a particular attention to some activities in their companies - with knowledge-risk as one of areas of concern. Knowledge-risk may have the potential knock-on effect which will subsequently erode the company’s returns over time.

3.17 Information and KM

In the foreword to Brown’s book *Knowledge Advantage*¹²⁹, he says that documents evoke reactions and creations in the knowledge process. A shared document may at times provide the basis for discussions with interested individuals and this in itself is knowledge-sharing. It represents not the end, but the process of reciprocal communication, in which learning is bound to take place.

Knowledge and learning organisations are created and supported in various enabling conditions such as vision, strategy, and structure, among others. KM, by its nature, places more emphasis on the creation and application of knowledge and information by people and

¹²⁸ Tsoukas et al; 2002 181

¹²⁹ Browns; 1999 xi

how companies can enhance these processes¹³⁰. Information management is different in the sense that it places more emphasises on the proper management of documents, storage and retrieval systems and the re-use of physical documents. The best way to create business value with information is to reduce costs; to add value via the products and services offered to customers, and lastly by companies using information to innovate, to invent new products.

Rastogi¹³¹ says:

“Knowledge creates value through its instilling into products like cars, computers and copiers; and services such as financial, medical, and logistical. Knowledge in this context does not merely imply know-what, know-why, and know-how; it more importantly implies a firm’s ability to produce and deliver customer valued outcomes. The test of value creation is whether customers are willing to pay for a firm’s product(s) and/or service(s) under conditions of wide competitive choices open or available to them.”

The figure below by Donald Marchand illustrates how organisations use information in four possible ways to create business value. The structure is not cast in stone, as companies can apply any combination of all four strategies. Company B, for an example, may make use of information to create a new reality as well as adding value, while reducing and managing risk is not that important to company B. On the other hand, company A may put more emphasis on what company B is not doing, and uses information to reduce cost and manage risk.

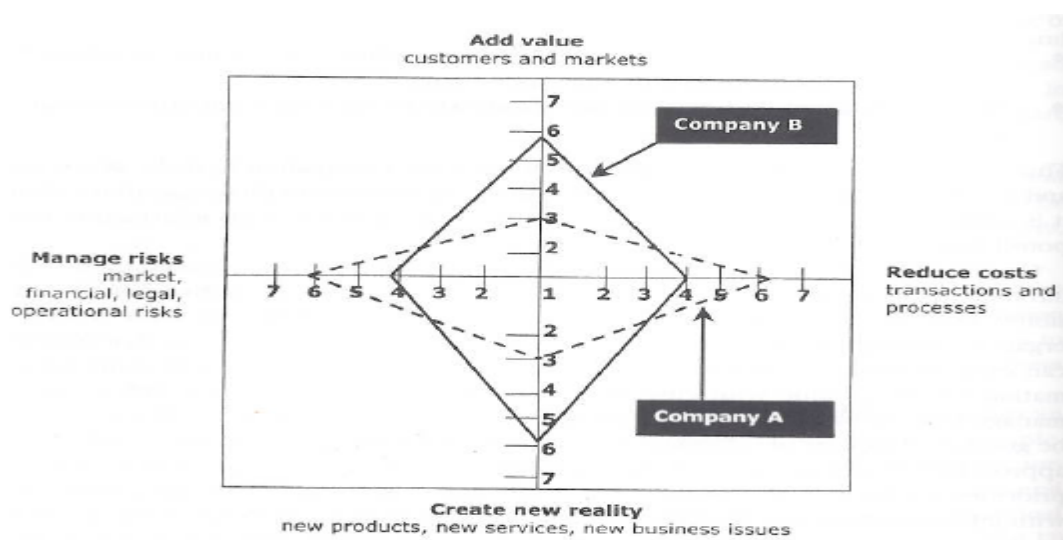


Figure 3.6: **How information creates business value**
(Source: Marchand: 2000, P. 6)

¹³⁰ Marchand: 2000; 09

¹³¹ Rastogi, 2002 234

This polar diagram is used to demonstrate various ways in which companies try to add a competitive edge to their business performance. A company which is seen to incline towards any of these information domains, shows that it has knowledge about its business environment and that the direction it is taking is the one most likely to bring success. The questions that will be asked in the KM survey will be shaped to provide clues about the way Sasol especially SASTECH tends to lean.

3.18 Intellectual Property and how it relates to KM

Intellectual Property is included in this research because it is often understood to be related to KM. It can also be defined as the knowledge, the sum-total of skills for making goods or providing services, that an organisation or a person has built up over years. Sasol takes IP seriously. This research may however not be adequate enough to discuss this in depth. Intellectual Property (IP) is a significant resource for many companies¹³² (including Sasol as already mentioned); it is the knowledge that can be applied to making money or for any other purpose that may be useful to an individual or organisation. The term Intellectual Property combines the following elements :

- an economic component, and
- intellect (“brain-power”).

The owner of IP can use it to produce goods and services while earning money in the process. This may be one of the reasons why companies like Sasol have dedicated teams on IP. This knowledge (IP) or information is never easily acquired nor is it commonplace and needs to be protected. Terms such as Restriction of Trade, Patent Rights or Copyright are examples of measures by which individuals or an organisation can prove and safeguard their rights to commercially valuable intellectual property.

In order to promote development, a holder of registered intellectual property (IP) might collaborate with partners yet retain the identifiable right as its legal title-holder¹³³.

“The most widely used definition of intellectual capital is ‘knowledge that is of value to an organisation: its main elements are human capital, structural capital and customer capital.’ That definition suggests that the management of knowledge (the sum of what is known) creates intellectual capital.”¹³⁴

Rastogi, in his article on Knowledge Management and intellectual capital competitiveness,

¹³² Sullivan, P.H; 2006 132

¹³³ SASOL, 2009 - Intranet

¹³⁴ Bassi, 1997

argues that

“ . . . KM engenders and encompasses a dynamic nexus of organisational learning, innovation, skills, competencies, expertise and capabilities. It evolves and graduates toward the development of a company's intellectual capital¹³⁵”

Intellectual Property and how it relates to KM can be clearly understood in their similarities as defined by Rastogi below. Rastogi defines intellectual capital as

“ . . . The holistic meta-level capability of an organisation to generate creative and effective responses to extant and emerging, present and potential challenges facing it, in an ongoing manner”¹³⁶. The similarity with the two is that “... both KM and IP represent modes of competitiveness based on the individual and collective brain power of people.”

.From the explanations above, it can be deduced that the difference between the two is that KM also includes managing IP, but not the converse. In his paper on KM and IP, Rastogi alluded to the fact that

“ . . . the only thing that gives an organisation a competitive edge – the only thing that is sustainable – is what it knows, how it uses what it knows, and how fast it can know something new”. The researcher wants to find out if this has risk potential in as far as Knowledge Management is concerned.

Rastogi¹³⁷ sees IP as something that represents a firm's meta-capability toward overcoming challenges and exploiting opportunities in its continual pursuit of value creation.¹³⁸ The difference between commercial success and failure, as Harvey puts it, is IP. This is because, according to Harvey, IP represents between 50 and 70% of America's private sector GDP¹³⁹. Globalisation has created a space in which information can be used to produce anything from anywhere in the world. In order to succeed, organisations need to think, create and design new innovations and it therefore becomes inevitable that the IP of a company will become its core¹⁴⁰.

An example given by Bassi concerning KM and IP relates to software companies. He says

¹³⁵ Rastogi, P; 2002

¹³⁶ Rastogi, P; 2002

¹³⁷ Rastogi, P; 2002

¹³⁸ Rastogi, P; 2002

¹³⁹ Harvey, I; 2004 01

¹⁴⁰ Harvey, I; 2004

that the competition in this type of business is so intense that the only way for the company to keep afloat is if it has the better know-how on managing its knowledge, creating and capturing and then leveraging with the very knowledge that they have for a competitive advantage

Intellectual capital is everywhere; it flows through every aspect of the life of a business, and it can make or break it.¹⁴¹ IP protection (both legal and otherwise) is designed to ensure that the owner of an IP right is sufficiently reimbursed for the use of this right, so that socially beneficial creations will exist (i.e. will be created in the first place) and will also be used by those other individuals that most value them (that is, access to them will indeed be able to be successfully marketed in a socially fruitful manner)¹⁴².

IP (Intellectual Property) is a synonymous to Intellectual Capital (IC), except that it relates more to the range of personal property rights attaching to various products of the human mind¹⁴³. It is intangible and as a result IP property rights are not enforceable by possession, but by action. IP usually refers to tangible, governable sets of formal documents such as patents, trade-marks etc.

It must be noted that KM is a critical factor in developing the value of a firm's intellectual capital¹⁴⁴. In today's business environment, strong forces of competition and globalisation have created an urgency to focus how an organisation controls and nurtures its intellectual capital¹⁴⁵.

3.19 Intellectual Capital as a paradigm of value creation

Most companies' value is identified by their tangible, physical assets i.e. immovable and movable property. Trends are however slowly recognising the value of non-financial, non-tangible assets such as brand names, employee culture, business relationships etc. The Industrial Era has come and gone and the Information Era seems to be taking the same path. This is because companies can no longer compete simply on the value of information as they have done; as Bassi¹⁴⁶ remarks: "*The ever declining cost of technology for information*

¹⁴¹ Elmslie, M; 2006 01

¹⁴² Watt, R; 2007 677

¹⁴³ Elmsie et al; 2006

¹⁴⁴ Ungerer, U; 2006 84

¹⁴⁵ Perrott, B; 2007

¹⁴⁶ Bassi, L.J; 1997

processing has made both technology and information ubiquitous.”¹⁴⁷

Currently the worth of something like a patent (an IP item) is very big in monetary value. In 2000 IBM was reported to be receiving at least one billion dollars a year on patent royalties alone¹⁴⁸. In some instances, IP may be a good, solid, easy-to-sell step towards a larger KM programme.

3.20 Sasol’s Intellectual Capital

Sasol is a company with interests in various business spheres, both locally and internationally so the value of the IP locked up in all these entities is closely guarded. Sasol has an Intranet website that contains details on group’s IP. The website is also used for registering all new patents arising from the group’s business.

Sasol also has what “IP Focus Areas” tasked with managing its IP when collaborating with external partners. Examples of this are managing their gas-to-liquids and coal-to-liquids technology in joint ventures. This also applies to its gasification IP management, technology ring-fencing, Syngas-to-chemicals IP strategy, and corporate trademarks – its world-renowned Fischer-Tropsch catalysis – establishing guidelines, networks and systems to optimise innovation capturing.

Sasol implements systems for protecting non-registered IP, and for trade secret policy implementation and for its pilot collaboration with China; it develops and implements IP governance structures, employs IP technical advisors and provides IP administrative support, to name some of its IP activities.

3.21 Sasol’s patent portfolio

May¹⁴⁹ defines patents as follows:

“Broadly, patents protect industrial knowledge or ideas (which must be codified in a formal application to a patent office); copyrights only protect the particular expression of ideas (related to artistic and other expressive forms, like music), while trademarks are renewable registrations of specific signs used to identify specific companies’ products. All are subject to (varying) time limitations.”

¹⁴⁷ Bassi, L.J; 1997

¹⁴⁸ Koenig, 2000

¹⁴⁹ May, C; 2002 1048

Sasol's IP, represented by its copyrights, patents, trade-marks confidential information and trade secrets and designs, are categorised according to its various technology fields:

- O&S and Solvents businesses
- Fischer-Tropsch catalysis and integration
- Refining and fuel
- Waxes, mining, phenolic resins and other polymers
- Explosives, fertilizers and polymers, and
- Gas-to-liquids (GTL) and coal-to-liquids (CTL).

3.22 SASOL's Corporate IP Strategy Matters

The group has developed a patenting strategy for appropriate IP protection. There is also an IP Governance Committee that provides governance in all IP-related strategy matters in the Sasol Group. This takes the form of IP guidelines, policies and procedures and includes external research on IP ground rules, a legal privileged communication policy, a communication protocol, a standard employee IP and confidentiality agreement, a patent infringement risk assessment process etc.

A quote from Sasol's Intranet site on its general IP considerations says:

"The effective management of our intellectual property is an essential component in obtaining and maintaining a competitive advantage in our businesses and creating long-term shareholder value. Intellectual property rights (IP rights) are constituted by legal rights arising from a person's intellect and creative talents. These IP rights take the form of patents, confidential information, trade secrets and technical know-how, registered design rights, copyright, and trademarks, trade names and domains".¹⁵⁰

3.23 Summary

This chapter attempted to explore the development of KM, from Socrates to the present day. However, this research is not about the history of KM, but rather its application to modern business practices. Donald Marchand was extensively quoted in this chapter as an authority on matters of knowledge and information management. The value of KM to an organisation was discussed and it was compared with other notable management concepts.

This chapter also explored the literature and included the thoughts of high-profile

¹⁵⁰ SASOL, 2009

management analysts like Peter Drucker. It traced the rise of KM as reflected in the writings of Japanese academics Nonaka and Takeuchi and charted the virtually universal adoption of this concept by a huge range multinationals. Marchand's work was again consulted when examining the issues of information and Knowledge Management and various definitions of intellectual capital were discussed. This chapter also mentioned the possibility of intellectual property rights stifling development or competition if not properly managed. The following chapter will be looking at Risk Management as well as Value Management as they relate to Knowledge Management and what this means to organisations.

Chapter 4

The Relationship between Risk and Value Management

4.1. Introduction

In this chapter, the concepts of Risk and Value Management are defined and discussed for the purpose of this research. An attempt is also made to explain the principles of Risk Management, the Risk Management cycle and Value Management in the context of Knowledge Management. The work of Boisot on the “paradox of value” within the broad KM spectrum is also brought into perspective. The chapter ends with an examination of, the interrelationship between value, Risk and Knowledge Management.

4.2. Knowledge Management and the Risk principle

Every organisation faces risks during its lifespan, but they can generally be mitigated by good control systems, which can either alert management to existing problems or, better still, prevent them from happening¹⁵¹. As it has already been mentioned, Sasol has various departments with a mandate to mitigate risk.

In the well-documented case of the failure of Barings Bank in London, a small but important segment of the company’s trading wing had been neglected, with disastrous results. The risk control measures in place had been designed to cope mainly with agency, rather than the growing proprietary, business¹⁵². This statement supports some of the arguments of this research; that organisations, including Sasol, are most knowledgeable about the positives of KM They may even at times have some risk management systems in place. However, Risk in relation to KM is not adequately addressed. The organisations may thus be unknowingly opening themselves to risk that comes with KM

In her book *The IT Practitioner’s Guide to Knowledge Management, Business Intelligence &*

¹⁵¹ Marchand, D; 2000 203

¹⁵² Marchand, D; 2000 204

Content Management, Jessica Keyes¹⁵³ argues that the major focus of KM should be to collect relevant company documents, reports and other sources and to analyse their contents with a view to identifying meaningful relationships. This is not the approach proposed by this research, which departs from the notion that “*at the heart of all KM practices lies the process of learning*”¹⁵⁴

The major focus of KM is therefore not to analyse contents, but rather to learn and create value through interaction with the people or interest groups in a specific field or domain. Keyes¹⁵⁵ makes the point about the dramatic ascension rate of innovation in the market place, emphasising that knowledge must evolve and be assimilated at an ever-increasing rate. She proposes that knowledge cannot just be assimilated by gathering content, but that learning should be an essential part of gaining knowledge as well. It is this value and the subsequent risks that this research is about.

The notion above seem to be supported by various authors including Marchand¹⁵⁶ when he argues that while IT and Information specialists play important roles in supporting how a company uses information effectively, general managers should be able to, in their daily running of their company, understand and deal with the following¹⁵⁷:

- business processes
- organisation structures
- Behaviour and values amongst other things, to achieve business strategies because they (general managers) are wholly responsible for their company’s performance.

The prevalence of KM risk in Sasol or any other organisation for that matter has financial consequences. It is in most cases, financial disasters, which have threatened the collapse of even the “strongest” businesses. The examples below bear evidence.

- Financial markets turmoil in the UK
- The housing market disaster in the United States of America
- The collapse of Enron

¹⁵³ Keyes, J; 2006

¹⁵⁴ Rastogi, P; 2002 236

¹⁵⁵ Keyes, J; 2006; Vii

¹⁵⁶ Marchand, D; 2000

¹⁵⁷ Marchand, D; 2000

- The near collapse of the French bank – by a 20 year old
- Locally, the failure of O.K. group of companies
- The collapse of the mining giant – Matodzi resources.

The lessons learned from these events are generally applicable to any business and Sasol is no exception. Sasol itself has also been the target of anti-competition laws, leading to fines of almost R300m being imposed locally, while the company has also been heavily penalised on the same count overseas (in the UK).

There are lessons learnt from these happenings in the financial sector of recent years as they relate to general management issues around the use of business information in managing risk. These lessons are therefore highly relevant to all firms¹⁵⁸. It is envisaged this research will add some value to Sasol in that regard.

The Knowledge Management strategy document¹⁵⁹ for Sasol says that KM for Sasol will continuously add value by:

- Connecting people with people
- Sharing and learning from experiences
- Creating platforms conducive to culture of sharing
- Appropriate management of Intellectual property.

The strategy document however fails to make aware, potential risks, however insignificant or significant that this may be to the company. This is the selling point of this research. To bring forth those issues; to make aware. Risk may have various meanings to various people. Below is the definition of Risk that will be adopted for this thesis.

4.3. Defining Risk

There are many different ways in which people, scholars and business managers define risk. The definition of risk varies somewhat between the various disciplines. Risk is a negative phenomenon that may adversely affect the company if left unmanaged. Companies that take Risk Management seriously can manage and anticipate risk factors and even turn some of the risks into opportunities, thereby creating value for the company. Simply put, managing risk is the process of containing any negative surprises¹⁶⁰.

¹⁵⁸ Marchand, D; 2000 197

¹⁵⁹ Sasol, 2003

¹⁶⁰ Mangiero, S.M; 2005

The following two terms are frequently used in relation to risk: Risk Assessment and Risk Analysis. Depending on how they are being looked at, these terms are interchangeable: *Risk analysis* is applied to the whole process of identifying a risk and its qualitative and quantitative assessment, while *risk assessment* is judging, either qualitatively or quantitatively, the probability and the potential impact of some risks.

The Project Management Institute¹⁶¹; although referring to specific projects, seems to agree with Vose¹⁶² by saying that the objectives of Project Risk Management are to increase the probability and impact of positive events, and to decrease the probability and impact of adverse events in projects. This definition is specific to projects environments and its also relevant to the purpose of this research. PMBOK (Project Management Body of Knowledge)¹⁶³ mentions the following fields as potential beneficiaries of risk management:

- education Risk Management
- military Risk Management
- IT Risk Management
- construction Risk Management & start-up Risk Management, etc.

Risk and uncertainty are inherent factors in most business and government operations and need to be understood for rational decisions to be made¹⁶⁴. Sasol is not immune to this fact. For the purpose of this research, the author will show the types of risk terminologies available in the various literatures from which a definition specific to this research will be formulated. Valsamakis et al¹⁶⁵ quote Dickson's definition of Risk Management as *the identification, analysis and economic control of those risks which threaten the assets or earning capacity of an organisation*. The purpose of a business is primarily to make money – that is the bottom line and the definition above displays an orientation toward a general management function as mentions the word/s *economic control*.

Valsamakis et al¹⁶⁶ argues that *Risk Management is a response to the view that an organisation's leaders have a generally recognised responsibility of securing and protecting against pure risks threatening it assets and earning capacity*. The above explanation

¹⁶¹ Project Management Institute; 2004 237

¹⁶² Vose, D; 2000

¹⁶³ Project Management Institute; 2004

¹⁶⁴ Vose, D; 2000

¹⁶⁵ Valsamakis et al; 1992 13

¹⁶⁶ Valsamakis et al; 1992 14

acknowledges that organisations need to recognise as well as protect against risk. They (Valsamakis et al) define Risk Management as *a managerial function aimed at protecting the organisation, its people, assets, and profits, against the consequences (adverse) of pure risk, more particularly aimed at reducing the severity and variability of losses*¹⁶⁷.

It can be evidenced from the above explanations that the definition of risk is relative. risk as defined by Sasol may be according to their important projects. Valsamakis et al argues that one of the problems in defining risk in a universally accepted manner is that the contexts within which risk can be viewed, are so diverse¹⁶⁸. They argue that this brings about various interpretations as well as definitions that are suited only to specific area of study. Hence, in an actuarial context for example, risk is given a statistical interpretation; whilst in the world of insurance, the term *risk* may be used to describe the subject of the policy (the property or liability that is insured) or the peril that is insured under the contract¹⁶⁹. This is also defined differently in the context of Sasol as it will be evidenced later in the research.

Whilst Risk Management is defined by scholars such as Dallas¹⁷⁰ as the identification of organisational uncertainties, their critical definition and analysis as potential threats to the firm and the identification of ways to weaken or eliminate them by means of risk avoidance, reducing its impact or by transferring the risk to another party.

For the purpose of this reseach, Risk Management will be defined as the process of managing negative surprises and attempting to create value from them. For this to happen one needs to understand Risk Management as discussed below.

4.4. Understanding Risk Management

To properly appreciate the concept of risk, this paper will briefly trace risk to its origins. This however does not mean that there are no other contradicting different perspectives on this concept or even the origin of risk management. It is generally accepted that the modern concept of risk management originates in the United States of America¹⁷¹. Some scholars may however argue differently. According to some literature, risk management, can be traced

¹⁶⁷ Valsamakis et al; 1992 14

¹⁶⁸ Valsamakis et al; 1992 24

¹⁶⁹ Valsamakis et al; 1992 24

¹⁷⁰ Dallas, M.F; 2006

¹⁷¹ Valsamakis et al; 1992 3

as far back as 1700 BC when the Babylonians established bottomry¹⁷² as a means to handle the risks associated with international trade¹⁷³. These are the same developments that contributed to the establishment of the insurance industry. Risks were handled mainly by transferring the financial consequences of the risk to the insurance industry¹⁷⁴. In 1916 however, a man called Fayol, wrote a seminal article on the functional approach to management identifying some basic management activities¹⁷⁵ and that's how risk management got to be recognised as a separate management function.

A close scrutiny will reveal that the above explanations, prior to Fayol, almost always equates risk to finance. The focus has mostly been on investing in risk with a hope of financial compensation in case of a loss of assets.

The concept of risk in this instance, does not adequately address the purpose of this research. This is partly because KM risk cannot be insured in the traditional way or any other way for that matter. This is also due to the fact that in a KM economy or environment such as Sasol, people are the single most important Knowledge assets of the organisation, and they cannot be insured against "Knowledge loss" in case they leave the organisation.

An examination of the relevant statistics reveals the substantial impact that various risks have in terms not only of economic loss, but also of human suffering¹⁷⁶. This statement by Valsamakis et al is important to this research because human suffering in this instance can be equated to or replaced with organisation suffering. This could mean things such as financial loss, loss of productivity due to the departure of a knowledge expert amongst other things. It is postulated in this research that a need exists to find a risk management process that effectively address the issue of Knowledge Management risk.

At some point in the spectrum of risk, lies pure risk¹⁷⁷. The nature of pure risk has dictated a Risk Management process which may be seen as divorced from traditional risk theory with which definitions of risk and return have been expounded and trade-offs between return and

¹⁷² Bottomry was a type of loan which was issued on the value of goods that were shipped between two countries. Repayment of the loan was based on the safe arrival of the goods – the seller had to repay the grantee if the goods arrived safely, if not, the loan did not have to be repaid.

¹⁷³ Valsamakis et al; 1992 2

¹⁷⁴ Valsamakis et al; 1992 2

¹⁷⁵ Valsamakis et al; 1992 3

¹⁷⁶ Valsamakis et al; 1992 12

¹⁷⁷ Valsamakis et al; 1992 12

risk evaluated against a general financial market activity or index¹⁷⁸. Valsamakis et al continues to argue that *pure* risk management has tended to evolve piecemeal and implies in part a *physical* process of controlling risk, as well as a *financing* process for funding the consequences of risk, where the insurance mechanism has traditionally played the most significant role. It is therefore argued in this research that *pure* risk management could be used as a means to isolate, understand and to manage Knowledge Management risk in Sasol.

The challenges facing contemporary risk managers is simply whether or not risk management as it pertains to pure risk situations can be approached in a structured and integrated manner¹⁷⁹. A need exists for the effective management of risk – a *total approach* to the problem of risk – which encompasses more than simply prudent insurance management.

Effective risk management ensures that value is not eroded by avoidable mishaps or uncertainties¹⁸⁰. A look in some of the Information and Knowledge Management articles¹⁸¹ indicates that research into risk management, specifically implementation risks, is not something new. There is a general shortage of literature about KM environments that are functioning well in organisations, and especially about the risks that attend them.

Chatzoglou and Diamantidis are two of the few researchers who have conducted research into risk, specifically the IT impact of firm's non-financial IT risk¹⁸². In their view, firms are typically affected by four types of risks¹⁸³ and they are:

- financial risk
- hazard risk
- strategic risk, and
- operational risk

Chatzoglou et al, however warn that the risks mentioned above are classic and therefore common to every organisation. Among the risks that they regard as “beyond classic risk types” are aspects like reputation and data integrity. The risk that is investigated by this thesis is the one that Knowledge Management may pose to Sasol. It therefore may include all of the above mentioned risk type.

¹⁷⁸ Valsamakis et al; 1992 12

¹⁷⁹ Valsamakis et al, 1992; 12

¹⁸⁰ Dallas, M.F; 2006 xi

¹⁸¹ Chatzoglou, P.D. et al; 2009

¹⁸² Chatzoglou, P.D. et al; 2009

¹⁸³ Chatzoglou, P.D. et al; 2009 119

In an introduction to this research it was said that Risk Management is a very broad field and that attention needed to be focused on the issue of Risk as an element of Knowledge Management within Sasol. Understanding what risk management is and how it operates will add value towards managers within the company.

R.M is seen as a vitally important, dynamic phenomenon. Dr Steven Barriers, a partner of KPMG's Risk Advisory Service, is quoted by Clayton¹⁸⁴ as emphasising that

“ . . . Risk is an undeniable part of business; we live in a world of change, with changing consumer landscape, technological change and psychological mobility of people . . . risk now depends on the people's ability to respond to risk with Information. It is a matter of strategy. Risk Management is a kind of Knowledge Management . . . that has to create space for informed decisions”.

From the above it can be deduced that RM is not about avoiding risk – it is rather about understanding risk. It is also not about avoiding threats that could affect the organisation and ensuring that they become less likely happen – Risk Management is also about managing benefits.

Consider this example: a company brings a new innovation to the market – cheap Fuel from Maize. The market becomes so receptive to this product that they buy up all stock within days of its release. The company then has too many orders to handle; people get frustrated by this and then buy an alternative but similar type of device that is readily available on the market. The risk in this instance comes from the overwhelming demand for the product (which is good for the company) and the under-capacity of the organisation to supply it (which is bad for the product). In the end, because there is such demand pressure on the market and a need to increase productivity that product quality drops, which stifles demand and directs potential buyers automatically to the competition. Now consider the same example in a KM environment. That is, KM is expected to yield positive results – but what about the unintended consequences of those results. Below is a look into risk in a KM environment

4.5. Controlling risk in a KM environment

The best way to controlling risk in any organisation or environment is to understand the need for risk management. If there is understanding, there will be acceptance that avoidable risks must be clearly identified and eliminated, while those that are not minimized must be “laid

¹⁸⁴ Clayton, S; 2007

off’ to the greatest extent possible¹⁸⁵. There is a general understanding of a need for risk management/control in Sasol – as evidenced by various risk departments the company has. However there needs to be focus on KM risk. The figure below should make it simple to understand the dynamics of risk and control:

Risk is:	The <i>uncertainty</i> of an event occurring, that could have an <i>impact</i> on the achievement of <i>business objectives</i>
Control is:	Any <i>action</i> to <i>manage</i> risk and increase the likelihood that established <i>goals</i> and <i>objectives</i> will be achieved

Table 4.1: **Understanding Risk & Control**

Source: Marchand; 2000

Like any other component of business practice, risk has to be managed. It is clear that risk is a part of doing business and its assessment, monitoring and control needs to be managed. Marchand¹⁸⁶ argues that the following four important actions as the key elements of a top-class Risk Management process. They are:

- RM has to be given top priority, from the directors downwards
- RM policies and practices need to be well implemented and regularly monitored.
- An integrated RM framework must be in place
- The whole organisation must be informed of these measures.

It has been evidenced that risk management process basically entails the control of risk. Valsamakis et al¹⁸⁷ argues that when the overall discipline is considered, it is necessary firstly to lay down a foundation on which individual activities and even disciplines can be based as this will achieve not only clarity in so far as what the objectives of the discipline are, but also clarity as to how activities may be integrated to help achieve the objectives. This is what it is referred to as, an integrated approach and it entails the following:

Risk identification

Risk identification may look into things such as loss of *knowledge assets* - which could be sudden, an accidental events resulting in financial loss. Before any attention can be focused on the management of risk, the source of risk must be identified and this would be the first step in mitigating risk in the KM environment.

¹⁸⁵ Marchand, D; 2000 211

¹⁸⁶ Marchand, D; 2000 211

¹⁸⁷ Valsamakis et al, 1992; 60

For instance the strategy document intends to implement and align KM processes in all Sasol Business units – this could be the first step in as far as Risk identification is concerned.

Risk evaluation and assessment

Valsamakis¹⁸⁸ argues that the evaluation process does require expertise in several disciplines and use of techniques, which by nature necessitates interface with numerous organisational units. For example, he says, in evaluating liabilities emanating from contractual agreements or in evaluating possible losses from a liability viewpoint of a new product, input from both the legal and research-and-development department is required¹⁸⁹. This is currently not the case in the company (Sasol) in as far as KM is concerned.

Risk control

This is aimed at implementation of a physical risk management programme to – reduce the magnitude of the exposure; reduce the frequency of the loss-producing events. This could be done by implementing such measures as knowledge transfer, coaching, shadowing etc. in a KM environment.

4.9. Principles of Risk Management

Risk Management in a KM area is concerned with improving the confidence levels of the organisation, to convince everyone that the R.M programme brings genuine business benefits. As mentioned earlier in this research, a lot of things can go wrong with any project or programme in an organisation and R.M helps to ensure that there is a structured way of capturing and reducing surprises¹⁹⁰.

R.M is most evident in the financial services industry; banking and insurance institutions, who have large numbers of dedicated personnel to manage risk issues. Sasol also has the internal services departments such as Finance, Insurance etc as mentioned above which makes the industries mentioned above. Risk Management in those instances is somewhat enforced by law and corporate governance; which may explain why Sasol has them.

Although big businesses also consider risk factors when they make business decisions, this

¹⁸⁸ Valsamakis et al, 1992; 60

¹⁸⁹ Valsamakis et al, 1992; 66

¹⁹⁰ Dallas, M.F; 2006

practice does not seem to filter through to other business functions. Risk is usually managed or calculated in monetary form only and this view makes it difficult for other types of companies to use risk management units when looking at their KM activities. KM units in most firms are so small that they are not allocated dedicated teams to manage their activities. However, if one considers the amount of company knowledge or rather intellectual capital that organisations stand to lose, this oversight could be catastrophic.

Every business needs to take risks, but if these risks are not managed effectively they could find that trading conditions become so bad that they go under¹⁹¹. It must however be noted that risk management is not just about eliminating risk altogether, but also about recognising risk and making available the necessary tools to mitigate that risk. Some risks may not be worth eliminating while some may require intervention at board level. It is completely up to an organisation's risk profilers and management to determine a policy on this matter.

The following aspects should be investigated when assessing risk issues:

- **Risk consequences** – What is likely to happen when the identified risk hits? Scenario building might help in this kind of solution. It must however be noted that risk probability and scenarios building are just that: they help expect the unexpected, but they cannot accurately describe what will happen once the risk has occurred.
- **The impact of risk** – The impact of a risk is likely to affect the following value propositions: Time, Cost and Quality. This is the only time that the risk manager will know the full impact of risk once it has occurred and this may have a profound impact on client satisfaction in terms of both service and product, e.g. productivity and profitability.
- **Likelihood of risk** – This may be expressed in various ways. The most common way of expressing this is qualitatively or quantitatively¹⁹²; qualitatively, as a “likelihood” and quantitatively, as a “probability¹⁹³. It is very important to note that the likelihood of one incident of risk triggering another is very common – a domino effect – and this must be factored in when doing risk analysis.

4.10. Risk Management cycle

This is a typical scenario that managers in a KM environment often use to mitigate or manage

¹⁹¹ Dallas, M.F; 2006 35

¹⁹² Dallas, M.F; 2006 36

¹⁹³ Dallas, M.F; 2006 39

KM risk. Knowledge managers do not see the project itself as a risk – that is, instead of investigating a KM as a risk, they investigate risk to the KM project. The scenario below shows a universal Risk Management cycle. In this case, the cycle can be used to investigate risks that KM brings to the company/business as well the risks that directly affect the KM project. The author's argument is that the company comes first and the project next.

For an example, if an ERP system such as SAP is to be implemented in a company, what is normally initially investigated is the risk of such a system to the company. Later in the project (but still during the initial stages) the risks to the SAP ERP, for example, will be investigated and addressed.

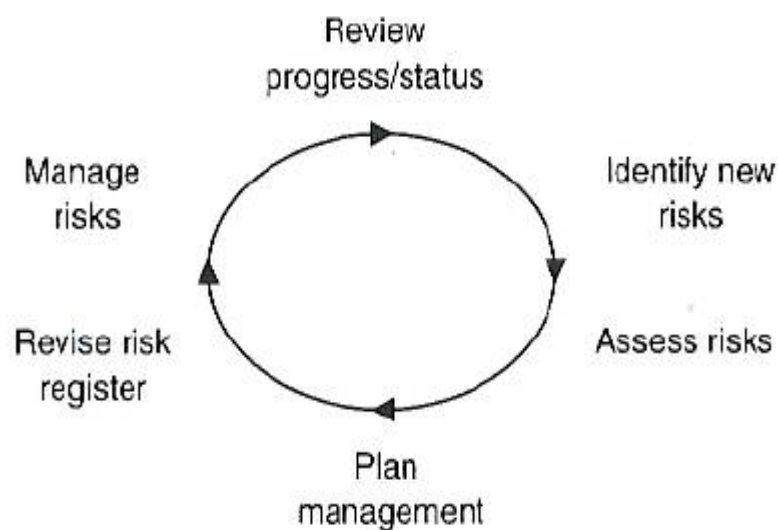


Figure 4.1: **Risk Management cycle**
(Source: Dallas, 2006:41)

Identifying new KM risks to the organisation may include such actions as a cost/benefit analysis; it may also include user acceptance in terms of organisational readiness: does the organisation see enough potential value in the initiative? Other factors such as organisational culture, the diversity of the people and the recognition and reward policies of the company will also have to be taken into consideration. Introducing a KM into an organisation often fails in the pre-feasibility stages, a fact that is often overlooked.

The diagram above by Dallas¹⁹⁴ shows the typical phases that an organisation will go through when establishing KM projects in a company. The inception, Stage 0, for the purpose of this

¹⁹⁴ Dallas, M.F; 2006

research, is about the project itself. Note that the author is referring to KM, first as a project and once it has been implemented, it becomes a business unit in the organisation.

4.11. Understanding Value Management

Fong et al.¹⁹⁵ quote the definition of Value Management used by the British Standards Institution as

“A style of management, particularly dedicated to motivating people, developing skills, and promoting synergies and innovation, with the aim of maximizing the overall performance of an organisation . . . Value Management simultaneously addresses management goals, encourages positive human dynamics, respects internal and external environmental conditions, and positively provides the methods and tools for achieving results.”

Standards Australia and New Zealand¹⁹⁶ define it as a structured, systematic, and analytical process, which seeks to achieve value for money by providing all necessary functions at the lowest total cost consistent with required levels of quality and performance. The process may be applied to management decision making at any level of an organisation and may specifically be applied to projects, products, systems, services, or processes.

Value Management (V.M) involves clearly articulating what represents value in terms of project and general business benefits and then linking these to the most cost-effective design solution. For the purpose of this research, V.M will be defined as, management goals to maximise overall performance with fair levels of quality and performance¹⁹⁷. The objective of V.M in a KM environment is to allow people to engage themselves for the greater benefit of the organisation, as well as for individual personal growth. An example of this is how BP achieved subconscious competence in KM¹⁹⁸ by matching BP’s performance with priorities, and how this helped operations to tap into relevant knowledge wells and provide mutual support in achieving targets. Some of the benefits realised from this initiative, as reported by Collison and Parcell¹⁹⁹ were that:

- a way was found of introducing new company-wide processes, based on the creation of a common language and self assessment tools, and

¹⁹⁵ Fong, Hills, & Hayles; 2007

¹⁹⁶ Standards Australia and Standards New Zealand, 1994, 4

¹⁹⁷ Dallas, M.F; 2006

¹⁹⁸ Collison et al, 2001

¹⁹⁹ Collison et al, G; 2001

- New ways to visualise overall performance were created, linking the “best in class” with those actively seeking improvement.

These benefits seem to support Fong’s quotes of BSI when they say that some of the tangible benefits of V.M are better decision making, increased project effectiveness, and improved understanding of customer/client requirements, enhanced competition through innovation, and the establishment of a common value culture, improved communication, enhanced teamwork, and creation of a win-win situation for all stakeholders²⁰⁰. Still, even in acceptable situations like this Risk Management has to be taken into consideration and avoid risk emanating from these fixes.

This takes us back to the suggestion by Ungerer et al²⁰¹ that the people in the organisation need to answer these questions:

- What is their value to organisation?
- How do they create and contribute to value?
- What is the value chain of their contribution?

Although the added value is not immediately financial in nature, it helps employees to touch on a Performance-Oriented KM approach²⁰² in that it encourages them to improve their:

- product knowledge
- process knowledge
- market performance, and
- organisational performance,

which then have an immediate impact on the bottom line. The effective application of V.M principles in any organisation will, in most cases, enable it to increase transparency and understanding of its organisational brand. Figure below by Dallas suggests that the likelihood of organisational success and reduction of the potential for failure and increased costs will be realised. V.M, like any other management practice, needs a commitment to continuous improvement in order to be sustainable over time. The graph below shows that Value Management is about time, cost and quality constraints – value is only realised if all three the items mentioned are kept to a minimum but remain consistent with the required levels of

²⁰⁰ Fong, H et al; 2007

²⁰¹ Ungerer

²⁰² Changs, S; 2005

performance and quality

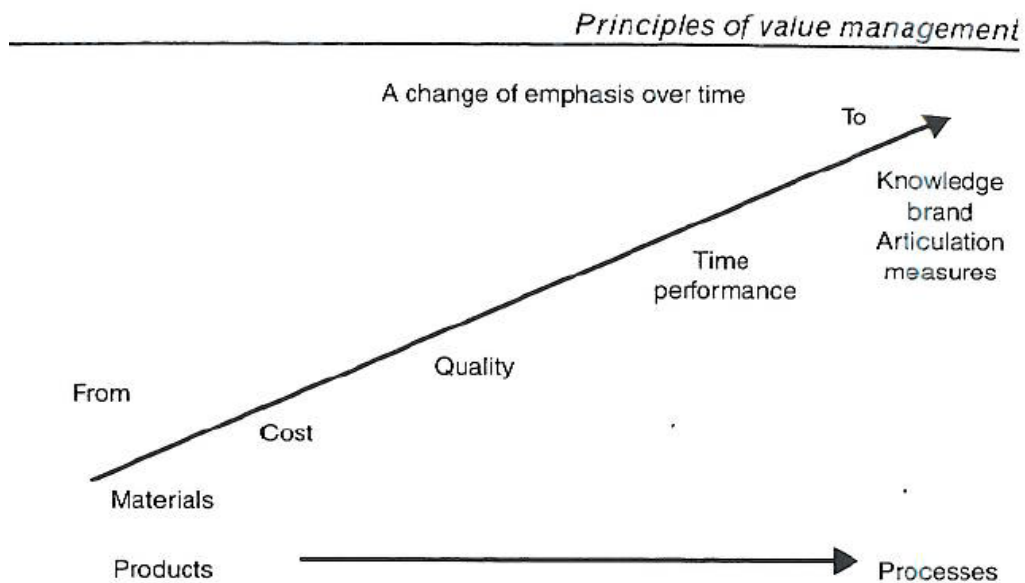


Figure 4.2: Principles of Value Management
Dallas (2006: 13)

In order to ascertain where the above-mentioned constraints about V.M are being adhered to, there are a number of measures that an individual or a company can follow and the next example by Dallas suggests how this can be approached. The value cycle is a representation of continuous improvement – it is meant to continue for as long as the employer takes V.M management seriously and the cycle typically starts with addressing the need for V.M

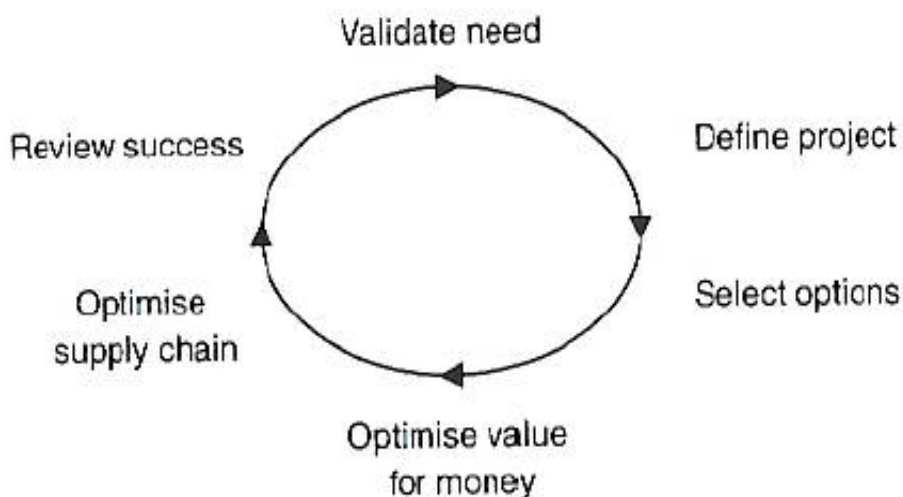


Figure 4.3: The value cycle
Dallas (2006:19)

Above is a typical value cycle, which starts by validating (recognising) a need. This stage is

mostly about what the project is intended to do for the organisation and seeks to answer the why, what and how questions. In this instance, KM would be seen as a value addition to specific parts of the organisation only and not the organisation as a whole. For example, KM might not be viewed as adding value to a finance department. The V.M cycle goes through many of the phases of any small-scale management project and would typically follow the Deming²⁰³ cycle of:

- planning
- doing
- checking and Acting.

Using the figure below as an example, during a project or in a work environment, the V.M Planning phase would cover the area from zero up to the first half of Gate 1 (Inception and half of Strategy) A combination of Strategy and Feasibility (Gates 1 and 2) represent the Doing stage.

This is where a manager would typically determine if V.M is needed in a KM environment, for an example. Pre-construction corresponds with the Checking stage – ideal for the graphic presentation of the value cycle in the previous figure. The Acting phase combines the Construction and Use phases below.

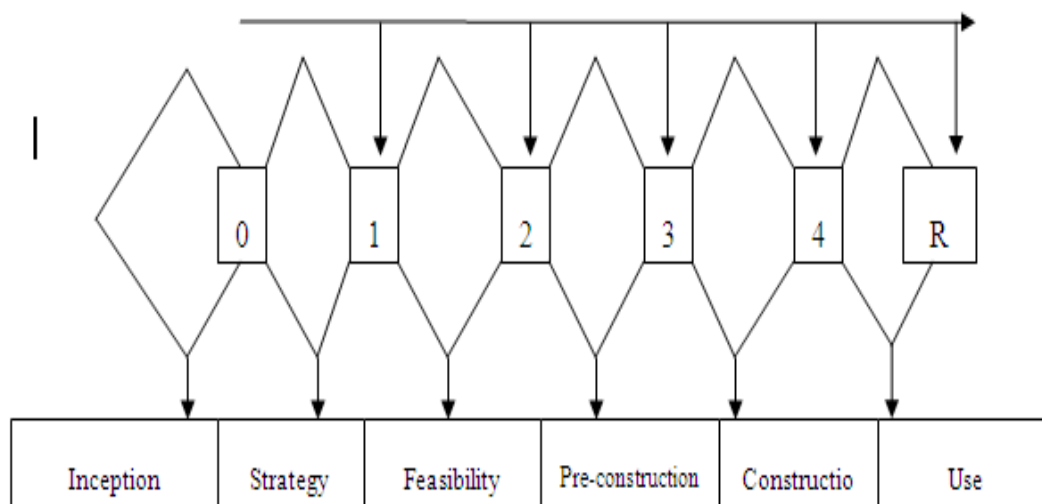


Figure 4.4: **Value Management in a project cycle.**
Adapted from: Dallas (2006:18)

There are different ways in which various people can ensure the continuity of value in any

²⁰³ Dallas, M.F; 2006

organisation. The figure below shows how Dallas sees V.M being applied in a construction environment, although this graph could be applied to any field that requires a V.M plan for business productivity. Each of the blocks below represents Decision gates, which is to say that at each block, a manager is supposed to stop and answer some pertinent questions before clear and valid decisions can be taken.

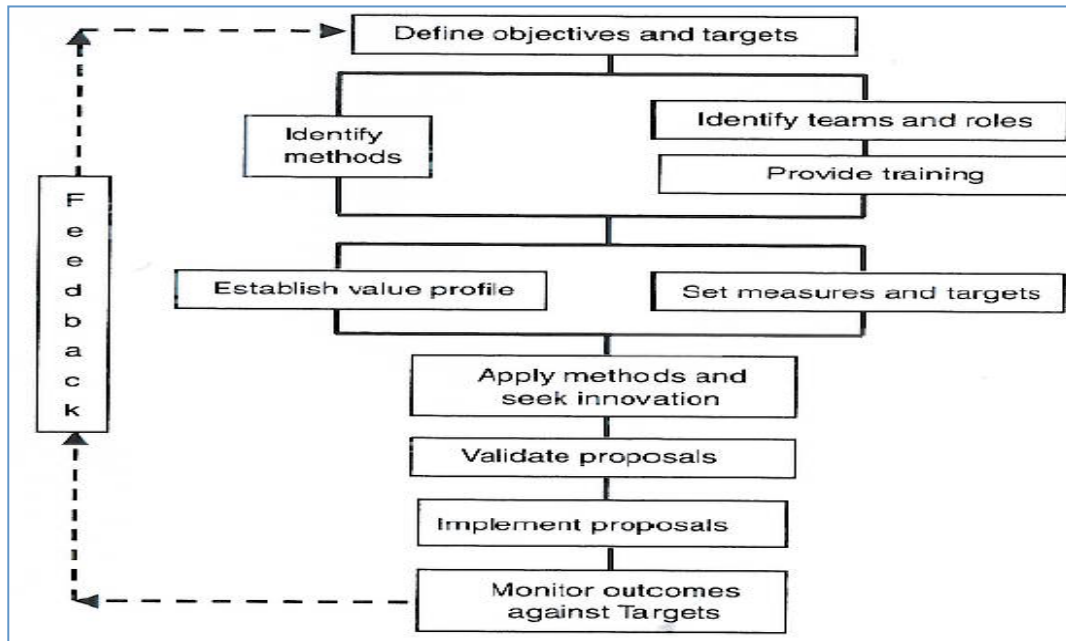


Figure 4.5: **The Value Management study plan**
Dallas (2006:20)

In essence, the V.M plan has seven important steps:

- pre-feasibility, where objectives and targets of the projects are measured
- Feasibility, facility planning, where best alternatives to a problem are developed, where teams to deal with it are identified and where the project execution philosophy training is conducted.
- Basic development, where project planning takes place, measures and targets are set and a value profile is established.
- Applying methods and seeking innovation, the stage that could be called Execution; here assets are allocated according to the business plan and items get implemented with minimum changes.
- validation and implementation of the proposals; in a KM environment this would be the start-up implementation phase where steady operation is factored in
- Evaluation and operation, where outcomes are monitored against targets, feedback is obtained and used or parked, and the cycle continues.

4.12. The Paradox of Value

As discussed in the introduction to Chapter 4, the interrelationship between Risk and Value Management must be clarified. This study is, among other things, aimed at determining how these two concepts (Risk and Value) complement each other in achieving business objectives. Boisot is an authoritative figure in the field of KM, and his book on Knowledge Assets²⁰⁴ has a chapter where he discusses the “Paradox of Value” and some of its implications. In order to illustrate his argument, Boisot devised the idea of I-Space (or Information Space)²⁰⁵, which will be explained below. In a nutshell, in I-Space, value will be determined by how useful information turns out to be in a *particular* application, and secondly, by how many different potentially useful applications can be found for it²⁰⁶.

Boisot says that:

*“The paradox of value holds that the further into the maximum value region the firm manages to move its knowledge assets, the more precarious becomes their residence time in the region on account of the competitive forces at work there and of the resulting diffusion of know-how that they set in motion.”*²⁰⁷

This study proposes that knowledge cannot be created in an organisation without putting its value at risk – risk and value in an organisation therefore both needs to be managed. The creation of new knowledge also gives rise to a new set of risks. The paradox as formulated by Boisot is that the more knowledge assets are shared, the less competitive an organisation becomes, yet in order to realise business value, a knowledge asset may need to be shared.

*“In industries (such as the Petrochemicals) characterized by high degrees of job mobility and informal ‘knowledge trading’ between professionals working for different firms, firm-specific knowledge may begin to leak out and diffuse fairly early in the process of codification and abstraction and hence well before it reaches the maximum value region of the I-Space”*²⁰⁸

Boisot²⁰⁹ claims that some economic concepts of “value” are always controversial in the sense that classical economists tend to see value in physical terms – this, he says, is

²⁰⁴ Boisot, M: 1998 84

²⁰⁵ Boisot, M; 1998

²⁰⁶ Boisot, M; 1998 78

²⁰⁷ Boisot, M; 1998 86

²⁰⁸ Boisot, M; 1998 86

²⁰⁹ Boisot, M; 1998 85

influenced by the concepts of land and labour, which are the main factors of production to classical economists²¹⁰. Boisot says these economists took value to reside either in nature itself or in the transformation that humans wrought upon nature²¹¹. In these arguments, one notices that “value” has been mostly defined from an economic or financial point of view. The value of KM in this case is attributed to the bottom-line impact that it brings to an organisation – and the bottom line is money. In all these instances knowledge or information does not play any significant role²¹². Boisot then developed the concept of value in the I-space²¹³.

Instead of defining the value of KM as is, Managers and Scholars measure and value what is called knowledge assets, which are things like copyright issues and intellectual property. Boisot maintains that knowledge assets are a source of competitive advantage to the firms that possess them²¹⁴. He further says that knowledge assets do not automatically guarantee a competitive advantage, but that firms need to know how to extract value from them.²¹⁵

4.13. Interrelationship of Value, Risk and KM

Value Management is about clearly articulating what represents value in terms of the project benefits and then linking these to the most cost-effective design solution²¹⁶. This suggests that for KM projects to succeed for instance, the most important item from the onset is communication – that is; communicate what is regarded as value-add to the organisation so that employees can take cue from there and know when they are performing outside or inside the scope.

On the other hand R.M is about identifying causes of uncertainty and what can go wrong, and then putting in place activities to minimise the adverse impact on the project²¹⁷. These two activities complement each other in a sense that while V.M can reduce risk, R.M increases value or at least it has that potential; R.M can also help maintain value²¹⁸. The figure below

²¹⁰ Boisot, M; 1998 73

²¹¹ Boisot, M; 1998 72

²¹² Boisot, M; 1998 72

²¹³ This is a tool that allows the drawing up of a value map for the analysis of knowledge assets.

²¹⁴ Boisot, M; 1998 70

²¹⁵ Boisot, M; 1998 70

²¹⁶ Dallas, M.F; 2006

²¹⁷ Dallas, M.F; 2006

²¹⁸ Dallas, M.F; 2006

shows what the outcome would be if the three concepts are better understood and managed.

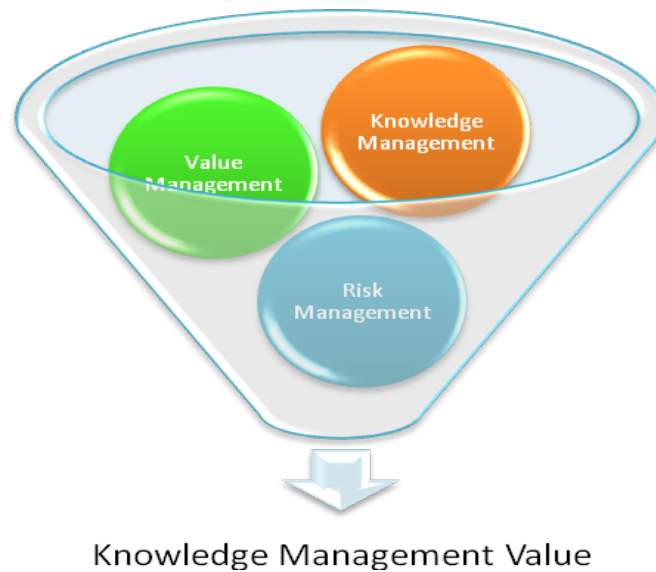


Figure 4.6: **Interrelationship between RM, VM & KM**

Source: Author, 2010

The key features and benefits of V.M, among other things, are to define desired outcomes; seek effective delivery processes; provide effective process to maximise value; address inconsistencies and provide a language map; provide clear briefs in clear priority; deliver cost-effective business benefits; provide a basis for refining the business case; provide mutual learning and enhanced team work; provide a way of measuring value and differentiate value types and demonstrate value for money

while the key features and benefits of R.M, among other things, are to define desired outcomes; minimise the unexpected and uncertainties; provide a process of managing risk; set clear project scope and expectation; establish project risk profile; be diligent with risk allocation; improve confidence to deliver within TCQ constraints; escalate severe risks in an orderly manner to obtain direction from the top; provide mechanisms for risk reporting, and record value and risk trails for audit purposes. The key features and benefits of KM among others are to stimulate growth, innovation, productivity and efficiency; build good customer relationships, employee learning, satisfaction, and retention, and assist with management decision making.

4.14. Summary

This chapter started with the premise that the objective of V.M in a KM environment is to allow people to engage in the most innovative way for the greater benefit of the organisation as well as for individual personal growth. V.M was defined here according to the British

Standards Institution's definition as a style of management dedicated to motivating and promoting synergy and innovation in the organisation, with the intention of uplifting the overall performance of the organisation.

This chapter concluded that RM preserves value by guarding against uncertainties and that reputation and data integrity are new risk types that will soon be included alongside the classic risk types. It is also noted that IP is a value and risk element that needs closer attention. It also takes cognisance of the fact that it is difficult to value intangible assets but that it is imperative for researchers and managers to do this. It was ascertained that RM strategies must be employed in any KM initiatives and that RM could essentially be seen as V.M. It was also acknowledged that RM in KM is difficult to measure in monetary value. The last chapter presents the conclusions, findings and recommendations as well as suggestions for future research. It will also present evidence that the objectives of the research have been achieved and to what extent.

Chapter 5

Assessment and Findings

5.1 Introduction

This chapter will delve into data analysis and data collected for the purpose of this study. The primary source of data for this research was obtained from the general literature. Managers, as well as the general staff were used as a secondary sources of information. As indicated in previous chapters, most sources obtained for this research concerning the company were public and official in nature. These sources can also be regarded as secondary sources of data.

In Chapter 1 Knowledge Management was discussed as one of management concepts amidst many others. What sets it apart is that knowledge-risk still needs to be fully explored and understood in scholarly terms. The literature consulted, e.g., Pollard said that the general expectations for KM, as already mentioned in the thesis, are that it will improve the following aspects of an enterprise: growth and innovation; productivity and efficiency, reflected in cost savings; customer relations; employee learning, satisfaction and retention, and management decision-making.

This is the general consensus in the literature in as far as Knowledge Management is concerned. This needed to be verified within the context of Sasol Technology. This is the reason why Knowledge Management self Assessment tool that is attached at the end on this thesis was used. Furthermore, the Risk potential of these general expectations need to be scholarly researched and analysed fully, since it is believed that they could have risk potential. Therefore, the recommendations and findings of this research wishes to add to the body of Knowledge in that context.

Intellectual capital may at first seem unrelated to the researched topic. It was discussed here as a subset of KM In essence, KM deals with Intellectual capital issues. That needed to be understood in relation and within the context of this research. This is due to the fact that among other things that were discussed was the value of KM to an organisation such as Sasol, how it integrates with Sasol's intellectual capital and how the company regards its approach to a corporate intellectual property strategy. All this has a bearing to the research

results obtained for this research. It is therefore important to understand IC and the justification for its inclusion in this research.

The literature as previously discussed says that People skills, judgment, experience and emotions are the assets knowledge workers express, communicate, represent and share with fellow workers and customers to achieve common business objectives and goals²¹⁹. The research results will reveal if this is the case in Sasol. It will reveal if this has a bearing on risk as a component of Knowledge Management. The above discussion involves Intellectual Capital at the least.

Included in chapter 1 is a figure by Bellinger²²⁰, which gives an understanding of the relationship between Data, Information and Knowledge. A similar model was developed for the purpose of this research. It is envisaged that the model will bring the researchers thinking into perspective and help to better comprehend the field of Knowledge Management and risk as understood for the purpose of this research.

It is also argued in various literatures that in organisations, people are driven, amongst other things, by the need to know what value they represent in an organisation so that they know when value is lost or gained. Knowing how value is created also usually gives direction to the factors that create this value. The literature says that at the individual level the concept of value is critical²²¹. Individuals form part of organisations, which in-turn forms multifaceted organic structures with a specific value proposition. KM is also a subset of those structures and its value need to be understood from various entries – hence discussions on value. This research studied the relationship between Value Management, Risk Management and Knowledge-risk factors in the South African petrochemical industry and proposes that organisations will be able to use the findings to assess the importance of the roles of RM and V.M more accurately when dealing with KM initiatives – only when organisations understand the relationship between Value, Risk & Knowledge Management will they know how to incorporate RM and V.M in their KM activities

5.2 Theme analysis

Questionnaires were mostly returned as hard copy after the interview and were then manually captured as Excel spreadsheets for processing. In the KM self-assessment interviews 10

²¹⁹ Marchand, D; 2000

²²⁰ Bellinger, 1997

²²¹ Ungerer at al, 2006

questions were asked, covering areas like communities of practice, learning before, after or during the project, knowledge assets, business alignment etc. This was done to assess the degree of satisfaction with the current KM environment in the company. The belief in KM as a concept was mentioned in the introduction of this research. This however still needed to be confirmed within the Sasol context hence tools such as KM Self Assessment and KM risk assessment were utilised. That is, to confirm or deny this assertion with regard to Sasol.

The premise of this research was that KM has been seen as beneficial to most companies and this questionnaire was used to see if the feeling was shared by the people of SASTECH. The interviewees were requested to rate the questions/statements on a scale of 1 to 10, with 1 as the current situation and 10 as the ideal. The second spreadsheet was then used to convert these into graphic representation of the current and ideal situations for further analysis. Next, the second questionnaire, which also comprised 10 questions, was given to the same people who had answered questionnaire one. The results below give some perspective on KM in SASTECH.

The following procedure was adopted for collecting data:

There were various methods used to collect data. That is, a Survey, a questionnaire which were supported in some case by an interview. A survey was online, via SurveyMonkey website (see appendix c). Questionnaires were used for Knowledge Management self/risk assessment portion. The KM questionnaire was sent to 60 targeted SASTECH employees, of whom 25 responded by completing the questionnaire. A mixture of multiple-choice questions with options to comment in own words was used. This approach helped in a sense that the respondent could complete the questionnaire with some reference towards answering the questions. It must be acknowledged that this may have some flaws. It may make, as in this case, some respondents lazy to answer in their own words.

Below and on appendix C are the 10 questions that were answered on the proprietary data-collecting software (www.surveymonkey.com). The answers were downloaded and processed in MS Excel to enable a statistical version of the results. Some survey questionnaires were returned as hard copy by respondents with no access to the Internet. These were also submitted anonymously and were manually entered into the system.

5.3 Knowledge Management Assessment

The graph below shows the results of the High-Level Knowledge Management self-assessment tool used by Knoco to assess the degree of readiness or the state of KM in an

organisation. In this case, the tool was used to assess SASTECH by using the same five points as Knoco. A 1–10 scale was used as shown in Figure 5.1 below, with 1 being the lowest score and 10 the highest. The intention to practice correct KM is evidenced by the red line running between 2 and 10 on the results spider plot. The lowest point given for current KM practice was 2. This tool was used, as previously discussed, to confirm if KM is stronger in the company.

The KM self-assessment tool showed that the company scored 64 percentage points on the current level and 94 points on the ideal situation that most people would like to see for themselves in an organisation. The graph shows that currently KM is not working at the levels the people would like it to be. The results are however satisfactory in as far as the current state is concerned. For clarity the spider plot results are also shown in the bar chart below:

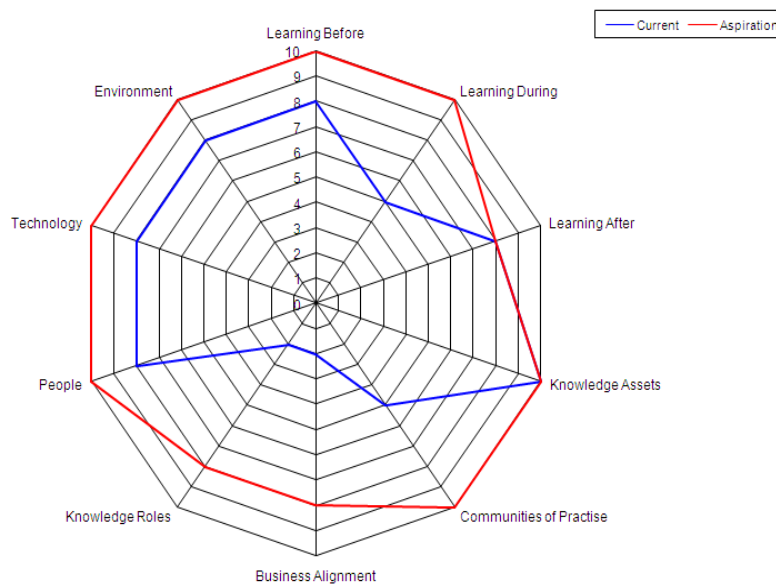


Figure 5.1: **Findings spider plot**
Adapted from: Knoco Ltd, 2009

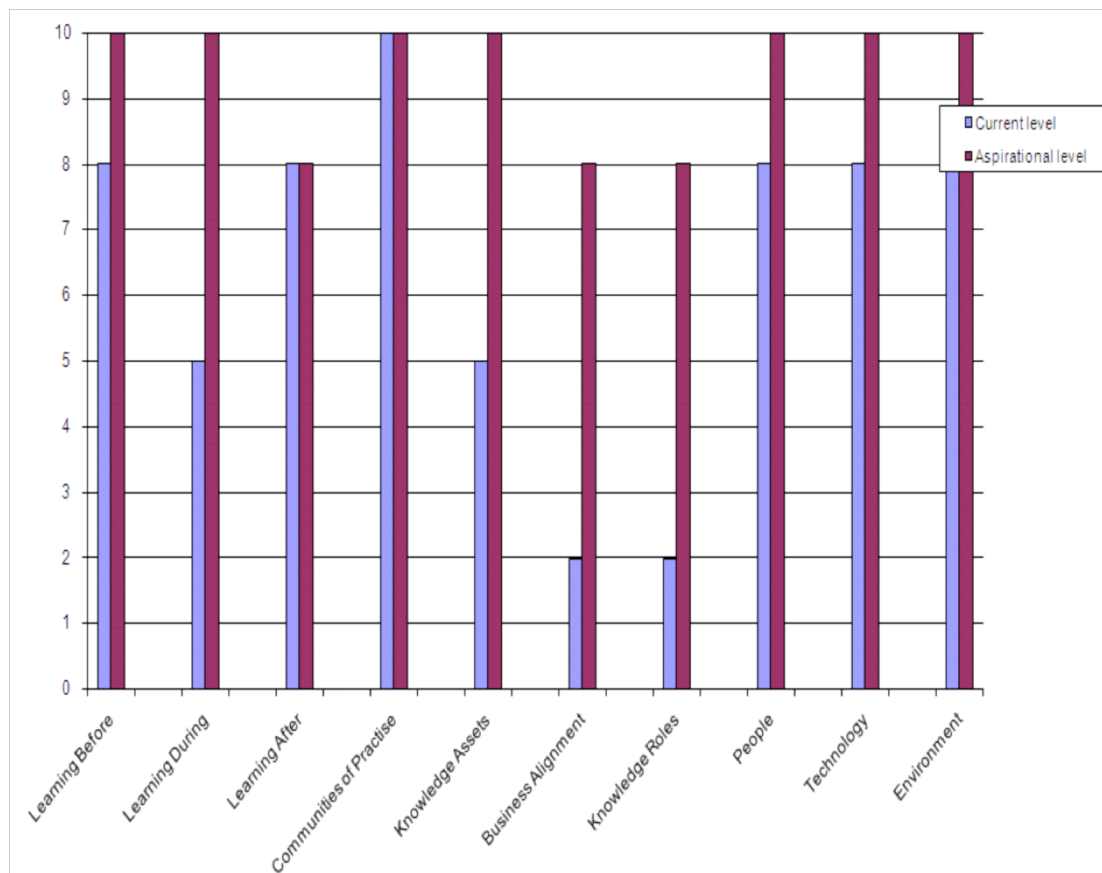


Figure 5.2: Findings chart
Adapted from: Knoco Ltd, 2009

5.4 Findings

The items that were identified as risks to Sasol's KM strategy were matters like over-optimism regarding the benefits of the KM effort or initiative overload (too many simultaneous project initiatives). This is in contrast to the 2003 Sasol's strategy document as discussed in chapter 1. There was also awareness that a competent IT infrastructure for capturing, categorisation and sharing knowledge was very important to the KM initiative and that it could become a threat if the IT aspect is not properly integrated into a Knowledge Management Strategy (KMS).

It was also suggested that it would be a waste of resources and in the worst case a great risk if the various business units did not formally accept and support the KM initiative. The cost-cutting activities that the company is currently implementing might pose another risk – the company might not invest adequate capital in the KM initiative to ensure its success. An effective partnership between the KM and IM divisions of the company would also need to be established, as the two units presently often duplicate each other's responsibilities. This is in relation to KM self assessment.

In the first chapter, it was mentioned that questions which falls under the following categories will be posed i.e. Process related issues; People related issues; Organisational change issues; Risk Management issues. Because they were many, the questions were then scrambled to the format evidenced below. They however still carry the purpose of this research.

With regard to the survey, the first question posed was: “Which risks below are you most likely to associate with a KM initiative in your organisation?” This question was intended to gain understanding of how people perceive KM in their organisation to determine if the organisation has the measures in place to ensure that RM is inculcated into the organisation from the lowest to the highest levels as previously discussed. Also it is intended to find out if there are reliable management information systems in place capable of controlling risks during times of change amongst other things. Respondents also believed that a lack of leadership could pose a risk to the KM initiative. Perceived failure of the project as well as an over-engineered solution were the aspects least regarded as risks. Below is a graphic presentation of the interviewees’ answers:

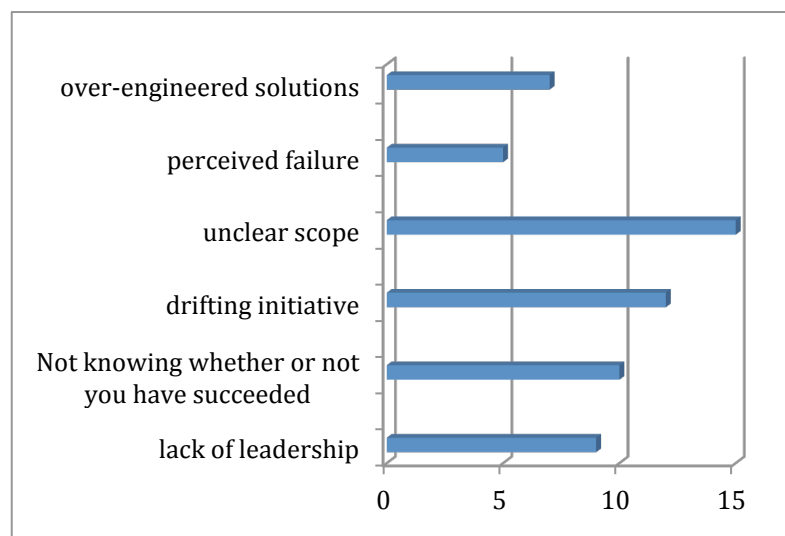


Table 5.1: Risk Associated with Knowledge Management

The second question, “How does your organisation ensure that it does not risk losing Intellectual Property when knowledge workers (skilled individuals in a specific domain) are recruited by the competition?” wanted to discover whether there was a general awareness in SASTECH about the risk of a knowledge worker to a competitor. Interestingly, most interviewees believe that KM offers a better way of managing of this possibility. Getting employees to sign restrictions of trade agreement and registering patents were given as the second most preferred way to avoid this situation.

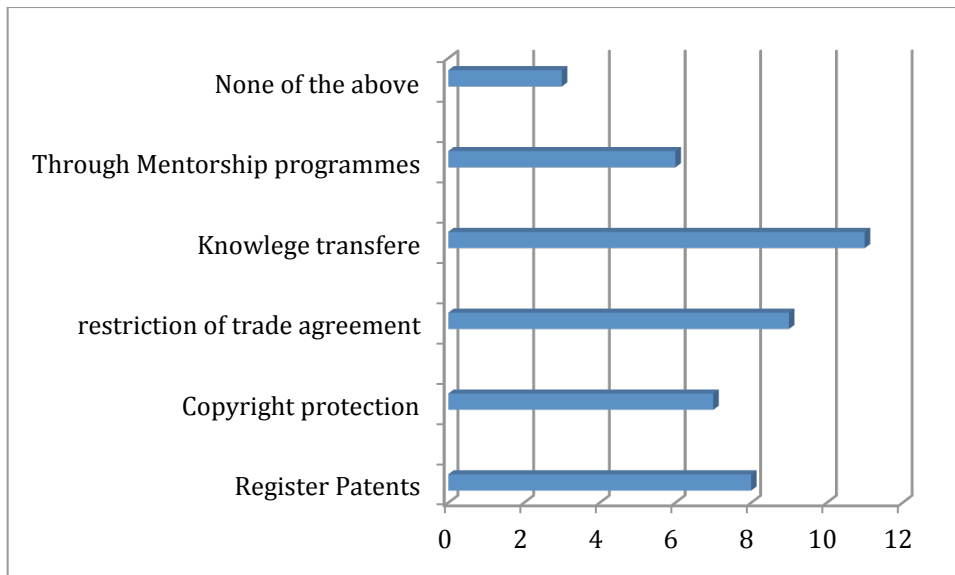


Table 5.2: Risk of losing intellectual property

Some of the people interviewed in this survey are managers. Although not explicitly mentioned, this question, “What action has been taken in your organisation to analyse and understand KM risk?” was addressed to them in particular. Most respondents said that they were not aware of any actions in the organisation to analyse and understand KM risk. Eight people said that the company was conducting internal reviews with the help of consulting firms, while majority said that the company had set up a RM department specifically to look into this.

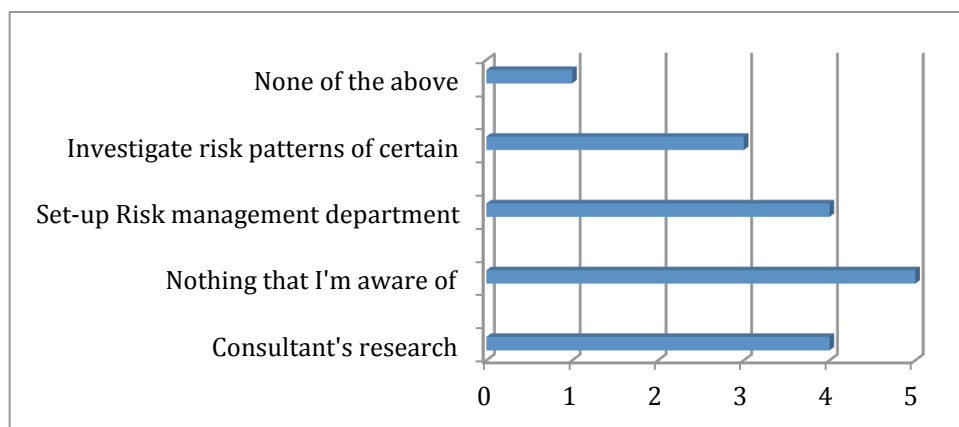


Table 5.3: Understanding KM risk

The question, “What review procedures are available to monitor these risks?” was intended that the interviewees would provide some sort of lead to information that may otherwise have been missed when evaluating the company. The answers came in as follows:

- Policies, training and evaluation of employee understanding of policies and procedures;

confidentiality agreements; None

- None that I am aware of; I am not aware of review procedures undertaken
- No information; None; Not sure
- Some procedures are in place but not in line with KM

This looks like there may be some sporadic interventions happening in the company, which the general staff members may not be aware of. The next question was that, “If a key staff member leaves, how much would the organisation be exposed?” A few people said that it would be close to impossible to tell just how much the company would be exposed if a key staff member left the company in their specific area of work. Very few (four) people believed that the company would run the risk of losing business to the competition; the same number as those who said that they didn’t have any idea as well.

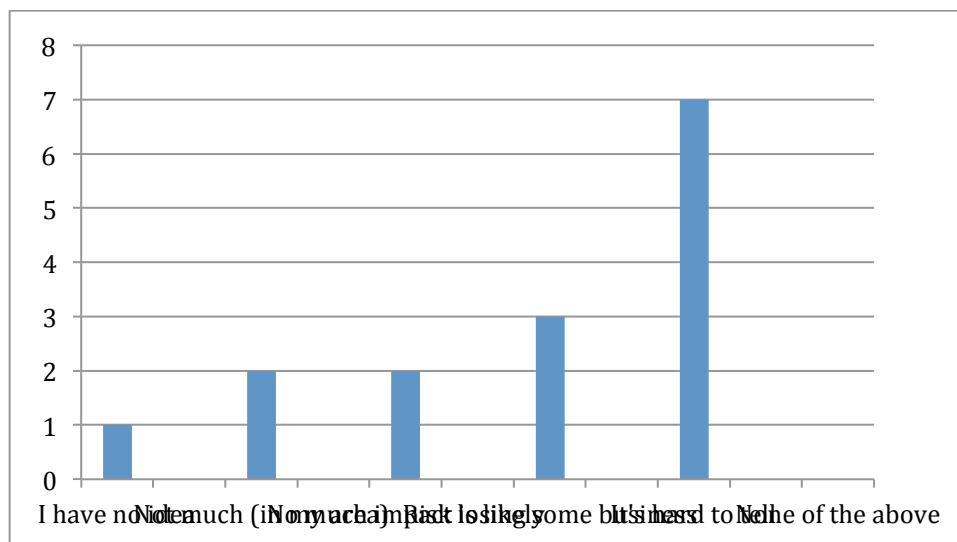


Table 5.4: **Organisational Exposure to Knowledge risk**

“Are there any plans that you are aware of to ensure that risk management is inculcated in the veins of the organisation – from the lower level employee to the board?”

According to 12 people, there were no plans in the organisation to ensure that risk management is inculcated in everyone in the organisation, although eight people believed that there was such an initiative in the company.

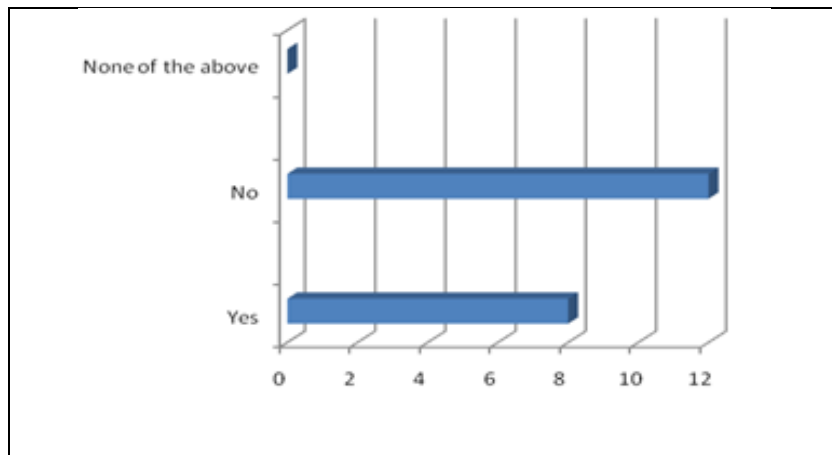


Table 5.5: **Organisational Awareness**

To the question “Could you identify how Knowledge workers could pose a potential threat to the company?” a substantial percentage of the interviewees said that they could identify how an individual could be a potential threat to the company: six said “no”, the other four were neutral, but the remaining twelve people said “yes” they could..

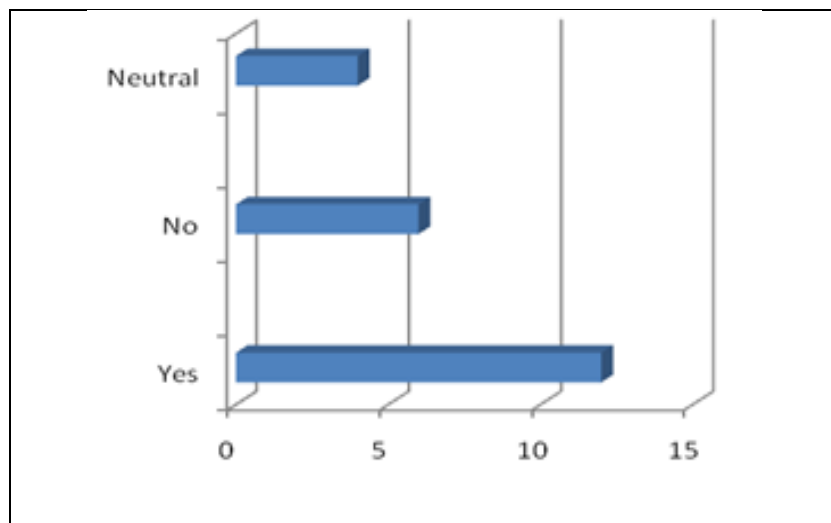


Table 5.6: **Knowledge Workers and the Risk to the organisation**

There seems to be difference of opinion when coming to Question 8, “Are there reliable management information systems that are adequately capable of controlling risks?” Eight people said “yes” and seven negated the statement, two just skipped the question, and another eight said that they were not aware of such systems.

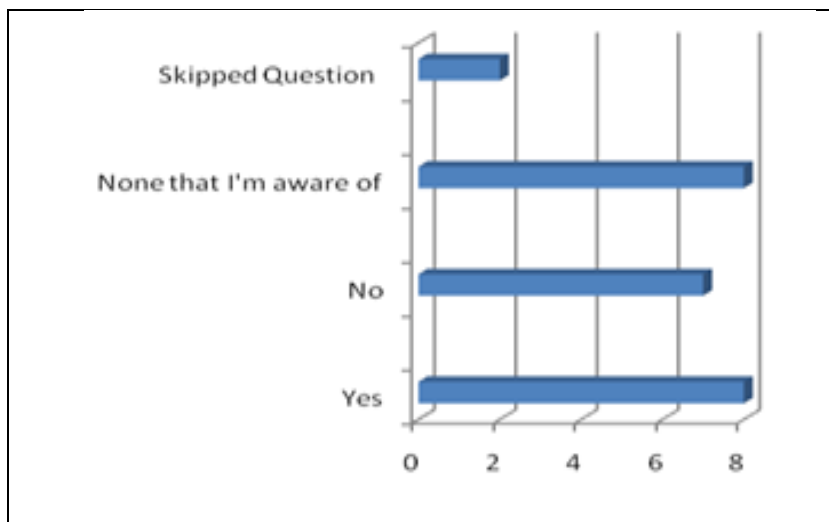


Table 5.7: Management Information Systems for controlling risk

To the last question, “Is there a team that is specifically overlooking KM investment and KM risk in the company?”, sixteen people said “yes”, there was a steering committee in the company responsible for the KM investment in the company as well as ensuring that risk was eliminated – seven said “no”.

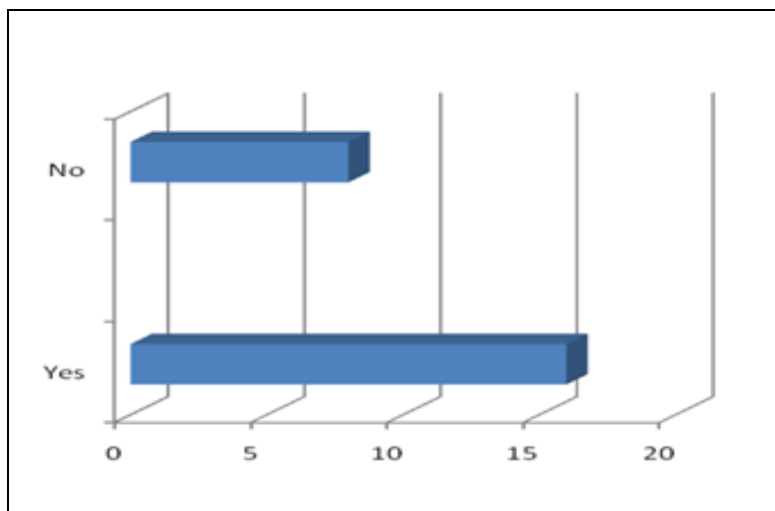


Table 5.8: Sasol Knowledge Management steering committee

5.5 Objectives of the Research achieved?

The hypothesis of this research is that if a consistent evaluation of risk as part of the Knowledge Management process can be clearly identified in an organization, then Knowledge-risk can be managed and contained.

Knowledge-risk was therefore tackled as the basis for this study. More specifically, the research argues that Knowledge Management can create both value and pose risk to a

company and therefore the study identified the objective of this research to examine the relationship between Knowledge Management, Value Management and Risk Management. There is a knowledge-risk tension that is created by the above factors. Only when organisations understand the relationship between the three, can they begin to incorporate risk and value management into their Knowledge Management activities.

This research investigated the risk and value associated with Knowledge Management implementations in the petrochemical industry of South Africa and how knowledge workers could be used by Knowledge managers to add value to the company without putting the intellectual capital of the organisation at risk. Among other things, this was achieved through:

- Investigating how knowledge workers can be used by Knowledge managers to add value to the company without risking losing the intellectual capital of the organisation when these workers are recruited by the competition.
- analysing the interrelationship between VM, KM and RM
- understanding RM in a KM environment
- identifying VM in a KM area, and
- Understanding IC as part of the broader KM initiative.

The research used various tools to investigate the consistency of the evaluation of risk and Knowledge Management within Sasol, particularly SASTECH as a case study.

The objectives of the research were achieved. The research was able to identify the relationship between Value Management, Knowledge Management and Risk Management as set-out in the study. Response rate to the survey and interview tools was adequate. The general participation in the study was satisfactory. The research was also able to relate Intellectual capital to Knowledge Management as it happens in Sasol. This is an important aspect as it may or may not be the case in other institutions. Below are the conclusions to this research and suggestion on how other studies may take the lead.

The conclusions derived from this research are that knowledge-risk is a general problem that goes with knowledge management activities and that it affect not only Sasol but other organisations as well. Organisations can to some extent alleviate this problem by resolving or coping with the knowledge-risk tension by having a comprehensive knowledge-risk schedule. The schedule should be focused on a) strategy b) policy and c) systems.

Risk management is a broad concept when it is applied to the context of Knowledge Management it requires a multi-disciplinary analytical approach. This was not found to be the

case in Sasol. However, there were sporadic signs within the company that this issue may be addressed in future. The Knowledge Management strategy document of 2003 – 2004 is a case in point. This is however an old document. It has since never been updated whereas people and organisations continually adapt to new and changing work environments. Secondly, Value Management is a rather theoretical concept, which for this reason also requires a multi-disciplinary analytical approach. It was established that value Management cannot be done in isolation. In-fact this is not possible. To create value some risk is needed, to create risk some element of value may be added. This was found to be the case in Sasol. Thirdly, Knowledge-risk can only be contained in an organisation. It cannot be completely curtailed; an organisation can only decide on how much risk it wants to expose itself to; bearing in mind that this can have both negative and positive impact.

- Process related issues

As far as this research is concerned there are no adequate and streamlined measures taken to analyse risk in Sasol, particularly Risk that comes with or as a result of Knowledge Management. As a result there are no formalised control measures and the review procedures put in place for monitoring these risks.

- People related issues

The assertion made from this research is that should a key staff member leave, the organisation would not be that much compromised. There are contracts and confidentiality clause in place for this type of issues. The strength of the company grows with people that stay, join and even with those who choose to leave. It was also found out that Knowledge managers cannot do much in as much retaining Knowledge workers is concerned. They can however help some of the Knowledge that this people possess. New recruits don't always understand the culture, the systems and the control procedures of KM and there are currently no training initiatives to remedy this.

- Organisational change issues

There is no general senior management awareness in the environment except for the sporadic awareness from staff members. However, the general structure of the organisation easily understood.

- Risk Management issues

The organisation has the measures in place to ensure that RM is inculcated into the organisation from the lowest to the highest levels, but this is not KM related. There are also

no management information systems for managing risk in place for Knowledge Management.

5.6 Towards a Solution for Knowledge Risk Exposure

Although most organisations recognise the need for RM controls, most of them take this lightly. It is self-defeating to have good policies and procedures in place and not use them. Too often control systems are seen only as additional superstructure and not as something that can and should add value by ensuring the effective utilisation of assets and the avoidance of waste²²² In creating an RM ethos, it is important to understand the key elements of the process:

- risk analysis
- risk avoidance and mitigation, and
- Risk monitoring and control.

This study proposes various solutions for knowledge risk exposure. It goes into detail on various processes such as people issues; process related issues; risk management processes as well as organisational change issues. First, knowledge risk exposure is looked into from the Sasol point of view, and then a general solution for any organisation is proposed in order to protect organisations from the knowledge risk exposure. Sasol, as discussed below, is a complex organisation with multiple and complex reporting structures. This makes it susceptible to knowledge risk exposure as will further be discussed below in detail.

a) Knowledge risk exposure: The case of Sasol

Sasol is a large South African multinational company that is formed by over 11 business units. There are various departments within these business units. Risk management department and knowledge management department are one of them. They each belong to different business units in the company. It is clear that the company is investing in risk management as well as knowledge management.

Risk management department is largely concerned with competition, legal and insurance issues. This means that knowledge risk exposure to business is largely ignored. This is an area of concern. Knowledge management department is concerned with productivity, continuous improvement and innovation. The two departments have got varying mandate which could see them leveraging on each other which is not the case currently. Between the two departments mentioned above it is not clear who is responsible to conduct knowledge

²²² Marchand, D; 2000 212

risk exposure. However, that is something for the management to decide. This chapter discusses a solution towards knowledge risk exposure – which the said management can use. The solution to knowledge risk exposure is thus discussed below.

b) Knowledge risk exposure: The proposed solution

It was postulated in this thesis that *Knowledge Management Risk Exposure* has three dimensions to the knowledge risk and that there may be a high level knowledge dying with the few that hold it (hence necessitating managed diffusion of such knowledge); also the same high level knowledge may leak out (as a consequence of erroneous diffusion and the scarcity value of such knowledge). The third dimension to this is that knowledgeable people sometimes do not know the importance of their knowledge.

The tension above needs to be resolved as it clearly manifest between the dimensions of risk mentioned above. That tension was how to ensure that knowledge is shared and repackaged; so as to keep it relevant and at the same time ensure that it doesn't leak to competition. There are various processes such as talent management and mentoring process that could be implemented in Sasol to address this issue.

In order to derive a solution, this research has utilised the following research questions which form part of the questionnaire on Appendix A. They are derived from Donald Marchand's book *Competing with Information*, and provide an overview of the sort of issues that need to be addressed when assessing a company's risk management measures. These questions should help resolve the issue of how to implement processes such as talent management and mentoring process. The questions are divided into 4 categories. These questions serve towards the solution for knowledge risk exposure. They are Process, People, Organisation and the risk management issues:

- **Process related issues**

Process related issues are things such as the measures taken to analyse risk in the company. They should look at what level in the organisation is this risk identified as well as the control measures and the review procedures put in place for monitoring these risks. This must be documented and communicated with the relevant stakeholders. A process review mechanism should be put in place to periodically evaluate the relevance of the set processes.

Process related issues must be able to effectively manage the use and or sharing of valuable knowledge to support specific business problems. This process will govern who (as in the role) should have access to certain information.

This discussion raises many additional process issues, such as high level and lower level process mapping that need to be addressed if organisations are to effectively manage the extent of the company's knowledge risk exposure. As a start, the organization must look into the following:

- Risk analysis pertaining to knowledge/Knowledge management activities
- Risk definition
- Appetite for risk i.e. low medium & high (there are four things an organisation can do in this regard – and that is Avoid, Accept, Mitigate & transfer risk)
- Governance – when the above is done, decide who is to have access to what type of sensitive information
- Then put in a process to govern above mentioned factors.
- **People related issues**

In this instance the questions that could be asked are: If a key staff member leaves, how much would the organisation be compromised? Do new recruits understand the culture, the systems and the control procedures of KM? If not, are there training initiatives to remedy this? How can knowledge managers help to retain knowledge workers - & find ways in which knowledge workers are/can be used to add value to the company and if so, to what extent?

In most instances however, knowledge managers cannot retain knowledge workers in the company. What they may be able to do is device a plan that would adequately cover the questions already asked. Such plan could be

- Minimise the degree of impact on business should the person with critical information be absent (i.e. leave/die/get sick etc)
- Ensure that this process tie with the process related issue above, especially on governance.
- The information to critical Fisher-tropsh technology for instance could be kept to very few directors (this will however need to be addressed by the risk control measures below)
- Training or access to training for the information above should be kept to the most minimum.
- **Organisational change issues**

Are there adequate reporting arrangements for KM to function? Are there areas of business that are largely ignored? Is the general structure of the organisation easily understood? Is senior management awareness maintained? Is there an awareness of the critical factors for

success/failure from the start?

Knowledge managers or managers in general could use these types of questions to evaluate their own SWOT within the context of knowledge risk exposure. They could use this to formulate a questionnaire type of instrument that they could use in the organisation to ascertain the level of Knowledge risk exposure. It is critical to remember that:

- KM function in many ways – but mostly as a support business
- Therefore adequate reporting procedure should include KM reporting to risk management about knowledge risk exposure and this should be made a rule.
- Not all Sasol business will experience knowledge risk exposure the same way
- Some will be critical whereas some will be high or low depending on what the business unit does.
- Senior managers need to be aware of this and have this decisions taken and documented about KRE of each business unit.

- **Risk Management issues**

Does the organisation have the measures in place to ensure that RM is inculcated into the organisation from the lowest to the highest levels? Are there reliable management information systems in place capable of controlling risks during times of change? If not, have they been considered for implementation? Is there a link between KM and Risk?

Some risks do have business value in cases where the price paid for the incurred risk is lower than the value it creates, in other words, where it has a favourable cost/benefit ratio. In assessing any risk, the expense to the business (the cost) should be restricted and managed in order to create more value (the benefit). This is one area where the risk management and knowledge management department have an opportunity to work/complement each other.

- KRE should always be monitored in an organisation
- Systems (IT and non-IT) should be put in place with proper access levels to control this.
- Risk exposure and appetite should be clearly defined.

5.7 Conclusion

Assessing the impact of risk in any organisation, as well as assessing the risk probability and building a risk management plan may prove to be key to any organisations risk management activities. This will help the organisation to be aware and manage risk by mitigating it, transferring, accepting or avoiding. The management will have a clear understanding of transparency about risk to the enterprise and also be able to understand the extent to which the company can absorb such risk. Critical knowledge in an organization will be better

protected and used when an extent to which is risky could be clearly defined and understood.

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Appendices

Appendix A: KM self assessment questionnaire

(Knoco, 2009)

KM self-assessment					
Focus areas	0	2	5	8	10
Learning Before	'Learning before' never occurs. All projects start from a knowledge base restricted to the tacit knowledge of the participants.	'Learning before' is a rarity. Most projects have no pre-learning.	'Learning before' occurs sporadically. It is neither unknown behaviour, nor is it routine nor expected. It occurs on an ad-hoc basis, or occurs locally within the firm.	'Learning before' is accepted behaviour for most pieces of work. It is however not required behaviour, nor is there the requirement to act on knowledge received.	Learning before' is part of required business process and occurs by default in all projects. Any knowledge so acquired is acted upon, and the originators are routinely acknowledged.
Learning During	'Learning during' never occurs. Any project reviews of forward plans have no element of knowledge capture.	'Learning during' is a rarity, and relies on the enthusiasm of the project leaders.	'Learning during' occurs locally within the firm, being applied at certain levels and not at others, or for certain tasks.	'Learning during' is accepted behaviour for most pieces of work, and is practised at most levels, but is not applied routinely, or is not embedded into business process.	'Learning during' is part of required business process and occurs by default in all projects, at all levels (managerial to factory floor). Any knowledge so acquired is acted upon, and the forward plan updated.
Learning After	'Learning after' never occurs. Any post-project have no element of knowledge capture.	'Learning after' is a rarity, and relies on the enthusiasm of the project leaders.	'Learning after' occurs locally within the firm, being applied at certain levels and not at others, or yielding results which are far from ideal from the point of view of re-use of knowledge	'Learning after' is accepted behaviour for most pieces of work, and is practised at most levels with reasonably user-friendly results, but significant levels or classes of project are omitted	'Learning after' is part of required business process and occurs by default in all projects, at all levels. The process is an effective one, and the output is specific actionable recommendations for the future.
Communities of Practice	There is no sharing of knowledge through practitioner networks.	'Communities of practice' are rarities. Either networking is not a standard business process, or the majority if networks do not function as knowledge-sharing mechanisms.	'Communities of practice' are set up for some business activities, or for many activities but without a focus on routine knowledge sharing.	'Communities of practice' are accepted mechanisms for knowledge sharing for most key business activities, but by no means all.	'Communities of practice' exist and are maintained, monitored, facilitated, and actively used, for all key business activities at all levels

Knowledge Assets	None of the companies operational knowledge is stored for future re-use.	'Knowledge assets' are rarities. They exist for a small proportion of business activity, and are not routinely owned by the communities of practice.	'Knowledge assets' exist and are owned on an ad-hoc basis for some business activities. Re-use of this knowledge is patchy.	'Knowledge assets' exist for most key business activities, but by no means all, or else are not routinely updated.	'Knowledge assets' exist and are maintained, owned, updated (by or on behalf of the communities of practice), and actively used, for all key business activities at all levels.
Business Alignment	Knowledge Management is treated entirely separately from the normal activities of the business.	Generally the Knowledge Management activities of the company are not aligned to the business processes, with a few exceptions	Knowledge Management is loosely linked to business processes, business targets and business needs. Some anecdotal linkage can probably be found in many cases.	Knowledge Management is generally linked to business needs, though by no means as 'hard wired' as, for example, financial management processes.	Knowledge is treated to the same business rigour as other assets of the organisation, such as money and people. Knowledge is covered in budgeting, auditing, Risk Management and all other critical business processes.
Knowledge Roles	There are no defined knowledge roles, and no assigned knowledge accountabilities in the organisation.	Explicit knowledge roles are a rarity in the organisation. Few business units have defined accountability for knowledge.	Knowledge roles are sporadically developed within the company. This is not a defined career path.	The majority of business units have somebody with a defined accountability for Knowledge Management.	Knowledge roles are established in all business units and in all communities of practice. There is a chief knowledge officer or equivalent at board level. Knowledge Management is an established career path.
People	The behaviours and the attitudes of the employees are entirely opposed to the free sharing of knowledge.	It is unusual to find people who are open to sharing and reusing knowledge. The default behaviour is still hoarding and reinvention.	Knowledge sharing is neutral behaviour. It is neither seen as desirable nor undesirable. It occurs in some areas of the organisation, but not others.	There is a general freedom in the sharing of knowledge throughout the organisation although some pockets of resistance remain and by no means everybody is open to sharing and receiving knowledge.	The behaviours and the attitudes of the employees are entirely conducive to the free sharing of knowledge. Knowledge sharing is default behaviour.
Technology	There is no technology available for communicating or sharing knowledge with others.	Some technology infrastructure exists, but only for relatively minor sharing of knowledge.	There is a general infrastructure of communications, but it is by no means easy or possible to share knowledge across the entire company.	The technology communications systems are generally good, but some barriers existed to free company wide sharing.	Technology exists for all staff to communicate company wide, both in real-time and asynchronous league, and to freely share and store written and recorded knowledge

<p>Environment</p>	<p>The company environment is such that Knowledge Management would have no effect, as there is no performance management system in place</p>	<p>The general environment of the company is not one in which organisational performance is a main driver, though there are some steps in place</p>	<p>Although there is some level of performance management system in place, it is patchy, ad hoc or incomplete.</p>	<p>Although there is a reasonably good performance management system, within the organisation, there is still some room for improvement</p>	<p>Knowledge Management is fully integrated within a risk and performance management system throughout the organisation, allowing KM to deliver its full potential.</p>
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Appendix B: KM risk assessment questionnaire



KM risk factors

Score = 0

	Green	Yellow	Red	
Internal Collaboration	The organisation drives performance through internal collaboration, rather than internal competition. A clear link can be seen between individual reward and collective performance	Although collaboration is encouraged and partially rewarded, there is also level of reward for internal competition. As a result, people are subjected to conflicting motivational pressures	The organisation drives performance through internal competition. Individuals, teams and business units are rewarded through competition, and there are no incentives to collaborate and share	Green
Performance Management	There is a very clear and visible system of setting clear targets, measuring results, and rewarding performance. Everyone is part of this system	Although some elements of a performance management system are in place, this is by no means uniform, or rigorously applied.	There are no clear targets, no measurement of performance, and no clear linkage between reward and measurable performance.	Green
Team and project focus	The work of the organisation is largely divided into projects, with internal customers, accountable project leaders, project teams, deliverables and deadlines	Some parts of the organisation work in projects and on teams, but many parts don't.	There is very little project work or team work in the organisation. Most employees are individual contributors	Green
Empowerment	There is full empowerment at all levels. Staff are empowered to make all relevant decisions, within clear boundaries	There is a degree of empowerment, but still many instances of a command and control approach.	The culture is one of command and control. The majority of decisions are escalated to management	Green
High level sponsorship	KM has an active sponsor in the highest executive levels of the organisation	Sponsorship rests at divisional level, rather than the highest level, or else the high level sponsor exists, but is not providing active championship.	There is no high level sponsor. Knowledge Management is being pushed from below, not above.	Green
Accountable team	Delivery of KM into the organisation has been given, as an objective, to an accountable individual supported by a dedicated team, with a budget. This team can drive change.	A team may exist, but may lack resource, budget, or experienced leadership, or may be at the wrong level to effect organisational change.	There is no single accountable person or dedicated team. KM instead is being delivered as a "skunk works" project or through an informal community approach.	Green
Holistic approach	The approach being taken is a balance of people, process and technology, with equal weight (and budget) being given to all three elements. "Connect" and "Collect" approaches are both addressed	Although all elements are being addressed, there is a significant bias towards one (technology, or processes, or communities, or knowledge bases etc)	The approach is heavily skewed towards introduction of new technology (or towards communities or practice, or towards explicit knowledge capture etc) to the exclusion of the other elements	Green
Assessment	A detailed external assessment has held, giving a clear view of the strengths and weaknesses of the current approaches, and of the corrective actions	Some level of assessment has been done, but this was either self-administered, or a "quick and dirty", or did not lead to a list of actions.	There has been no external assessment. The KM interventions are driven by a subjective internal perception of what is needed	Green
Strategy	A KM strategy is in place, and fully endorsed by senior management. This sets direction for a KM plan, objectives and deliverables, and aims towards the creation of a sustainable KM system.	There is a KM strategy, but it is either high-level, or incomplete, or does not feed through into a clear implementation plan	There is no KM strategy. Individual KM interventions are not chosen within a strategic context.	Green

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**Select the colours that apply using the pull-down choices.
Your final score will appear in the top line.**

Green final score - on track.

Yellow final score - seek advice.

Red final score - Stop! Ask the experts

Source: Knoco, 2009

Appendix C: Knowledge Management survey questionnaire

(As presented on surveymonkey.com)

1. Which, of the risks below, are you most likely to associate with a KM initiative in your organisation?
 - not knowing whether or not you have succeeded
 - drifting initiative
 - unclear scope
 - perceived failure, and
 - Over-engineered solutions.
 - other, (please elaborate)
2. How does your organisation ensure that it does not risk losing Intellectual Property when knowledge workers (skilled individuals in a specific domain) are recruited by the competition?
 - registering patents
 - copyright protection
 - getting employees to sign restriction of trade agreements
 - knowledge transfer
 - mentorship programmes
 - none of the above
 - other (please elaborate)
3. What action has been taken in your organisation to analyse and understand KM risk?
 - nothing that I'm aware of
 - set up a risk-management department
 - investigate risk patterns of certain departments
 - none of the above
 - other (please elaborate)
4. What review procedures are available to monitor these risks?
5. If a key staff member leaves, how much would the organisation be exposed?
 - I have no idea
 - not much (in my area)
 - not much impact is likely

- risk of losing some business
 - it's hard to tell
 - None of the above.
 - other (please elaborate)
6. Are there any plans that you are aware of to ensure that Risk Management is inculcated in the veins of the organisation – from the lowest level employee to the board?
- yes
 - no
 - None of the above.
 - other (please elaborate)
7. Can you identify how Knowledge workers could be potential threat to the company?
- Yes
 - No
 - Neutral
 - other (please elaborate)
8. Are there reliable management information systems that are adequately capable of controlling risks?
- Yes
 - No
 - None that I'm aware of
 - other (please elaborate)
9. Has there been training initiatives in terms of understanding risk in the organisation?
- Yes
 - No
 - None that I'm aware of
 - other (please elaborate)
10. Is there a team that specifically overlooks KM investment and KM risk in the company?
- Yes

- No
- other (please elaborate)