KNOWLEDGE MANAGEMENT: AN EXPLORATORY OVERVIEW

by

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Preface

Personally I found the writing of this dissertation a rewarding experience that really enhanced my knowledge on a subject matter, that touches every aspect of my daily working life. I hope that I can share the knowledge I gained with my peer group and management who are not familiar with the concepts of KM and CI.

I would like to thank Professor Nic Lessing for his support and advice and my parents for their encouragement. It made all the difference and gave me the inspiration to complete this dissertation.

Brief contents

Synopsis

KM is not an exact science. This is due to the unique qualities of information and knowledge as discussed in section 2.3 of this dissertation. What can be done at best is to look at some of the models available and then adapt it to the company's environment and specific needs. But even before a specific model is adopted, management must ensure that they consider all aspects of KM and not just focus on for instance IT and ignore the people aspect. Therefor it is important to understand the concept of knowledge, information and KM. Chapter 2 in this dissertation is dedicated to explaining the concept of KM and to distinguish it from IM. It is followed by a discussion of two generic KM models and a more practical model that illustrates the flow of information within an organisation.

CI as a subdivision of KM offers guidelines to companies on how to structure their information gathering process on competitors and the competitive environment. The CI process also includes the interpretation and presentation of the results of a CI program. CI practitioners spend a considerable amount of time gathering data, some as much as sixty percent. What is advocated in this chapter, is that CI practitioners or market researchers should construct a plan before they begin to gather information. They should identify the problems that they want to solve and then only collect the data to provide answers to these problems.

The final chapter in this dissertation presents a practical application of the various models discussed in chapter 2 in context of one of the newly established IDC SBU's . The NBD SBU's current KM activities are mapped on a KM map. Accordingly it can determine where it finds itself currently with its KM program and how it could develop its KM strategy. What made this application fairly easy was that the staff members of the SBU are familiar with the sources of market information and are experienced market researchers. They however did lack a holistic view of all the components involved in a

KM process, and the KM map certainly did help them to form a better insight of the possibilities that such a KM program offers.

Chapter 1   **Orientation**

Chapter 2   **A literature overview of KM approaches**

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List of acronyms

1. BI - Business Intelligence
2. CI - Competitive Intelligence
3. IDC - Industrial Development Corporation Of South Africa Ltd
4. IM - Information Management
5. IT - Information Technology
6. JSE - Johannesburg Stock Exchange
7. KM - Knowledge Management
8. KPA's - Key Performance Areas
9. NBD SBU - New Business Development Strategic Business Unit
10. SBUs - Strategic Business Units
11. SCIP - Society of Competitive Intelligence Professionals
12. WANS - Wide Area Networks

Chapter 1   Orientation

Chapter 1

1.1 Background

Developed societies have moved from industrial economies to what is referred to as the information age or knowledge societies. Information and knowledge are the driving forces behind such advanced societies. In an information-based society knowledge is the key element underlying any results-driven human activity. In this knowledge age the balance of company resources has changed to include information as the fifth and most important resource. Accordingly for business performance to improve overall, the way knowledge and information is created, managed and transferred should improve. (Duffy 1998)

A wired world has led to the removal of physical barriers which constraint business to geographical locations or markets in the past. Through intranets and wide area networks (WANS) seamless connections can be established enabling companies to conduct and operate business from various locations in the world. Flat networked organisations have developed with open flows of information. Information is disseminated through knowledge networks where company expertise and knowledge are shared amongst workers. All these developments in Information Technology (IT) have made so much information available that business finds it overwhelming.

The value of information to the company lies in the employee's ability to discriminate between what is useful information and internalise it so that it becomes knowledge. Two components are required to turn information in to a competitive advantage, namely learning people and information technology. Information technology is the enabling agent which make information available to people. To attract and keep the right people with appropriate skills and learning ability have become more important in a world where technology has become standardised and competitiveness no longer are derived from the traditional resources.

Much is currently written on KM, management theories which attempts to capture the evasive qualities of information such as its infinite nature and the fact that it is intangible. Many frameworks and management approaches are suggested, most of which endeavour to explain just how information should be leveraged to attain competitive advantage for companies. Some theories advocate a people approach where the ultimate goal is to create a learning organisation with learning people and IT as the enabling factor. Others say that companies should move beyond KM with the view of IT as an enabler but regard it as one of most critical forces that management have to utilise in order to survive in an ever-changing external environment. Some theories have it that IT has become the environment in which companies operate and think and accordingly new ways have to be found to create relationships between data elements and ultimately add value to existing information. How must management deal with this whole frenzy that KM is fast becoming? To attempt to stay abreast of all the new literature on this subject matter is in itself a full-time assignment.

What should be remembered is that some companies have been practising KM for many years with success before the advent of intranets, WANS, the internet and other IT applications. Companies that realised the importance of knowledge, knew how to effectively apply knowledge and who had systems in place to effectively disseminate information in the company. The Industrial Development Corporation of South Africa Ltd. (IDC) could be used as an example of an organisation that has always recognised the value of its human capital. Virtually all the activities the IDC undertakes are knowledge-intensive. Few business decisions are made without the backup of thoroughly researched reports, completed by various IDC specialist departments. It could also be said that the IDC has both the systems and professional staff in place to give it a competitive edge in the marketplace, and although its aim is not to become competition to existing industries, it does set an example to industry.

The IDC has been in the fortunate position in the past to attract top quality professional staff. It's competitive advantage lies in the comprehensive skills gathered under one umbrella. This enables the corporation to participate in major projects across the whole economy assisting its partners in various aspects of the projects. IDC has always maintained high standards in any research undertaken and has strict guidelines that must be followed when writing reports.

Investigating staff are forced to do extensive research for these type of projects. This has led to a learning culture in the corporation in which the library has always played a central part. Staff who have resigned always comment that they really miss having a well stocked library around, something they took for granted when they were at the IDC.

Through its diverse involvement with the South African economy IDC managed to build up a business and economics library collection which would be suited for the heterogeneous information needs of business. This extensive collection was built up through the years around the activities and projects of the IDC. Various specialist departments, including an agricultural, financial, geological, economy, legal and projects use to exist within the IDC, who were kept abreast of any new developments in their fields through industry journals circulated to them. All of these departments have fallen away since the new structure of the IDC have been implemented. These changes in IDC and the implications thereof for the library are discussed further on in this chapter. Various basic reference-works for these industries have been acquired but the focus of the library is on marketing and economic data. Accordingly the library is in the position to cater for the information needs of business not only through its well-stocked library, which gives a comprehensive coverage of the South African economy, but also through trained and experienced staff members. Dealing with such diverse queries equip the information officers with the necessary knowledge of the information sources to utilise the library stock to its full capacity.

With the advent of the Internet, more sources on information have become available to the IDC that in the past were too expensive, or difficult to access. One such a system that have become available on the Internet is DIALOG, one of the largest collections of online fulltext and bibliographic references databases in the world. Dialog offers sophisticated search methodologies that enable information officers to extract most of the published information available today. With this type of information resources and retrieval tools, the library can offer more comprehensive services than before. The information officers can be instrumental in their patrons decision making or problem solving process with their knowledge of how to select the correct information resources and extract relevant information from the wealth of information available. Unfortunately this information does not come free of charge. There is

in general a misconception about the cost of information, patrons expect to find quality information free, and are not prepared to spend money on authoritative resources. What they do not realise, is that the right information, in many instances, could have saved them many man hours and phone calls, both which are expensive cost items. The IDC are involved in various projects where the focus is often on the export market of which South African business has less knowledge. With these projects it would make sense to include the library in the planning and information gathering phase of the project in a more systematic way. The library is in the best position to establish what information is available, how it should be gathered and what the restrictions are (as discussed in chapter 3 section 3.4.3 collection constraints) in terms of cost and the availability of the information.

Bain & Company SA, benchmarked IDC against various overseas development corporations and came to the conclusion that the IDC should restructure itself, in order to become more efficient and streamlined. Through the years the IDC changed little in the way it operated, it had grown slow compared to a fast moving external environment against which it had to start competing. In the external environment the commercial banks also ventured into the more lucrative corporate banking sector, in which the IDC had little competition in the past. The turn around time for the cycle from the initial application for a loan to the granting of finance was to long and costly. The applications were received by one department, who did a basic assessment to determine whether the company met at least the basic requirements for finance. This department then compiled an investigation schedule which listed the teams that had to investigate the various applicants. The teams were made up from various departments as is explained further down this page. At times it could take a couple of weeks before sufficient staff was available to go on an investigation. This time frame frustrated some clients who normally want the money as soon as possible.

Investigation team usually conducted a due diligence study on clients, where they looked at the expertise of the management team, the relevant markets and the financial well being of the company. Some companies disliked the fact that strangers were virtually going through every aspect of their business. Although decisions were always grounded on thorough research it had to go through to many layers of management. This slowed the decision making process

down with to little responsibility channelled to individual investigation team members. Accordingly, clients had to wait to long before a loan for finance was approved. Some potential clients felt that it was cumbersome to approach the IDC for finance and went to commercial banks. Commercial banks are normally satisfied with the assurance that it has security for the loan and does not concern itself with every detail of the company's operations. They also usually grant loans within a couple of days.

Based, on the recommendations of Bain & Company SA, the IDC is currently going through a process of restructuring which will have significant implications for the way the library operates. Although the library is uncertain of the exact implications of this transformation on its operations, it knows that the IDC is re-organising itself into various strategic business units (SBUs). These SBUs are based on the current client base of the IDC and the various industries they represent. Included are SBUs for tourism, textiles, metals, agriculture, large beneficiation, minerals and mining, agro-industries, chemicals, wood and paper and new sector development. The aim with the establishment of these SBUs is to make the IDC more competitive and effective in its operations. Each individual SBU will be responsible for an entire application for finance from its initiation to fruition. Accordingly, management wants to increase the accountability of SBUs and monitor the performance of specific staff members. Once the success or failure of IDC can be traced to the performance of specific SBUs, reward and remuneration structures will be adjusted accordingly.

It is clear to the library that in future it will have to cater for the information needs of the corporation in the context of these SBUs. In the past the practice was that before IDC granted money to companies investigation teams made up from the financial, marketing and technical departments had to assess the viability of the application in terms of the existing business and proposed expansion plans. The marketing person who assessed the potential and existing market obtained the necessary background material from the library. Typically, manufacturing statistics, imports and exports, or information on other companies in the same industry and relevant journal articles are utilised to determine the market size. Media cutting files compiled from newspaper- and journal articles and databases covering various topics have been accumulated through time and are considered as the most useful source provided by the

library. Industry trends can be followed in these files. Information is supplemented by industry yearbooks, specific market research reports and various online databases. Information the library gathered for various projects in different industries are kept in paper copy in files.

The library now has the opportunity to make a contribution and give input in the planning phase of the SBUs towards establishing a KM and CI strategy for each SBU. For the purpose of this dissertation the New Business Development (NBD) SBU was taken and a broad KM strategy devised utilising two KM models. Although a competitive intelligence (CI) strategy would be useful to the SBU at a later stage, the SBU has implemented certain concepts of CI in their KM strategy.

1.2   Problem statement

Traditionally information officers and librarians and IT specialists were responsible for looking after the information sources of companies. They acquired, organised, stored and disseminated the information within companies. With the advances in IT much more can be done with information than those activities traditionally undertaken by librarians, new relationships and applications are possible within data elements. Accordingly KM has developed as a science that explores the possibilities that exist within new IT applications such as intranets, the internet, e-mail and others. KM offers new insights to information officers and some proactive information officers (or librarians) consider themselves as knowledge managers within their companies. Information officers have the potential with their knowledge of information resources, knowledge of the company, its employees and their information requirements, to play a vital role in KM. They will, however, have to take cognisance of the existing theory as well as new developments in KM.

One area of KM that should be utilised when scanning the competitive environment is that of that of competitive intelligence (CI). CI offers the possibility of providing a framework to the research officer in which to interpret and utilise information gathered in the competitive external environment. It is also utilised in specific research projects with the information

gathering phase of the projects With CI the research topic can be broken down to smaller components, which ensures that all relevant aspects are covered when information is gathered. CI offers a holistic approach to the information gathering and planning phase of projects by looking at aspects like the restrictions that could exist in the gathering of information.

KM gives a theoretical and practical framework from which to expand the traditional library functions of acquiring, organising, storing and disseminating information. Despite the wealth of literature on KM, little is written at a level which is easily understandable to the layman. Complicated theoretical models with jargon only familiar to the subject experts are presented, some of which only covers one specific aspect of KM. What is required is a straightforward, understandable approach, which brings familiar concepts to the manager or librarian in a coherent and structured way. CI as a subdivision of KM, encompasses the scanning of the competitive environment and more specific create a framework in the planning and information gathering phase of research projects.

1.3   Research objectives

A general overview of different KM approaches are given at a level which is accessible to management and people outside the KM field. On a more practical level two KM models namely Despres & Chauvel's KM Mapping Model and the Input-Output Model are discussed for application in the context of the New Business Development Strategic Business Unit (NBD SBU). The influence of culture on IM is illustrated in Max Boisot's Cultural Anthropology Model. CI is discussed for possible later application once the SBU is more established.

1.3.1   Objective 1 - An overview of knowledge management approaches. Information is a unique company resource with characteristics which calls for a different management approach than other resources. Much is written currently on KM, because of its newness as a management field a lot of attention is still given to define exactly what it is, a complex assignment for an entity which is intangible and infinite in nature. Each author has his own angle on the topic which could vary from a focus on human capital, or leveraging IT in new ways to gain competitive advantage. One message which comes through quite clearly in the

literature is that companies cannot ignore KM in the external environment, which is largely driven by IT.

Most companies have now moved beyond a technical perspective of merely using IT to accomplish certain tasks. Companies who have become comfortable with IT want to apply IT in new ways to help the company operate more effectively but also to leverage the technology in such a way that the company can obtain a competitive edge in the market place. KM offers a methodology of bringing human capital and IT together in such a way that the most can be made of available knowledge in the company. This dissertation attempts to look at KM from a holistic viewpoint through bringing various KM approaches together in an order which the student considers useful. KM takes the whole concept of managing information much further than the acquiring, organising and dissemination of the information traditionally undertaken by libraries.

1.3.2   Objective 2 - An overview of competitive intelligence (CI) as a business tool with the emphasis on the information gathering phase. This dissertation explores the possible applications of CI as a subdivision of KM with the emphasis on the information-gathering phase of CI. CI can provide a useful methodology in its information-gathering phase for specific research projects. It helps the research officer to identify what issues are involved when gathering information, such as collection constraints he should consider when planning the collection of the information in order to solve the research question.

1.3.3   Objective 3 – The practical application of the KM map and the input-output model as discussed in chapter 2 is applied to build a KM strategy for the NSD SBU. A CI strategy for possible later application in specific research projects is also discussed.

The NSD SBU is newly formed and has the opportunity to plan a KM strategy from its initiation. The KM map provides a chart whereby a company can plot and assess where it finds itself currently on the KM map and how it wants to develop its KM programme. The KM is based on what Despres and Chauvel's phrases as the "knowledge process". This process commences with the initial assimilation of information from the environment and progresses to

the highest level of value adding namely to innovate and evolve. The extent to which the company uses the knowledge it gains, to evolve and keep up with changes in the external environment, determines its success. Chapter 2, section 2.3.1 explains the six steps involved in the knowledge process. An input-output model is also used to consolidate all the sources of information on the IT industry for the SBU and can provide the framework within which the NSD SBU can plan and monitor the flow of information and knowledge and consolidate it in a database. The possibility of a CI strategy is mentioned in chapter 4 without going into any detail of how to apply it in practice, the NBD SBU should refer to chapter three for a more in depth overview of CI.

1.4 Research methodology

A general literature overview of KM is given followed by a brief overview of CI, as a subdivision of KM, and the CI process. In this way the reader is provided with an insight into various aspects and applications of KM. Most companies should have at least some sort of methodology to deal with its information and knowledge but this is often informal and unstructured. This could range from storing information in hard copy in files to informal meetings where knowledge and experience are shared between colleagues. A company that has no knowledge of its competitive external environment would for instance have little chance of survival, hence most companies would be applying at least some form of CI. If a company applies some aspects of KM and CI in a random fashion it does not mean that it has the necessary perspective and awareness of KM and CI to understand the potential benefits to be gained by having a more structured approach to KM and CI. The remainder of the dissertation focuses on the practical application of the KM models discussed in chapter 2.

1.4.1 Literature overview of KM

The study commences with a literature overview of KM. The literature was selected on the following basis:

- **Clarity**. Whether it is written in a clear and understandable language. From all the books, the one of Morris is written in the most accessible style and format, yet it still manages to

bring key concepts of KM to the reader. Chapter 2 is presented at a level that an audience with little knowledge of KM would understand.

- **Holistic**. It should offer a holistic approach to KM and bring KM across in such a way that the reader forms a perspective of an integrated process that involves several sequential steps. Although Depres & Chauvel (1999) and Duffy's (1997) models each has a different emphasis both present KM in such an integrated way and share some corresponding attributes such as identification, storage, access, distribution and application of knowledge. Depres & Chauvel incorporate these concepts into a "knowledge process" that has a synergy to the cognition process and Duffy labels it as "KM activities". Despres & Chauvel simplify the cognition and thought process to extract issues relevant to KM and present it in this "knowledge process" that a company can use to visualise where it finds itself in terms of its KM programme. Duffy's model presents KM in more practical terms and lists the activities that are easily identifiable with KM namely the identification, acquisition of the information, storage, distribution and finally the application of the information.

- **Currency**. The literature has to include developments such as the internet. Most of the books that are selected, are published after 1994.

- **Authority** of the authors. The book of the first Southern African KM conference, that includes well published South African authors, such as Duffy, is covered. In addition various other recent books with a more general approach to KM, are included to ensure that a wider perspective is given. Little South African journals articles could be found on KM. A Financial Times "Mastering information management series" which includes KM and CI in some of the parts are covered in the KM overview in chapter 2. This series offers a useful model which is summarised from different theories on KM, with well defined boundaries of the concept of KM.
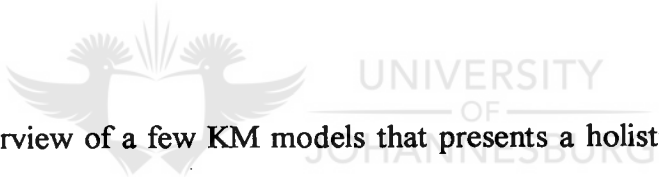
1.4.2   Devising a KM strategy for the NSD SBU

A KM map was completed for the NSD SBU to give it an overview of where it finds itself currently in the value chain of the KM process and how it would like to develop its KM programme in future. An input-output model is used as an practical example of how it could manage, and bring its sources of information together in practice.

1.4.3 Adaption of a CI methodology for information gathering.

Journal articles on CI were extracted from Ovid Technologies, Inc, which is a full text management database. Visits to the websites of Society of Competitive Intelligence Professionals (SCIP) (http://www.scip.org) and CIO (http://www.cio.com) were made and links on the sites explored. Based on the research methodology gathered in chapter 3 and the researcher's own practical experience in information gathering a CI strategy is suggested for future research projects of the SBU. A framework is created to incorporate all the reading matter, theory and the researcher's extensive experience of information management (IM) from a wide concept such as KM to a more specific subsection namely that of CI.

1.5   Limitations

This study gives an overview of a few KM models that presents a holistic view of KM. The aim is not to emphasise a specific aspect of KM but to illustrate that it is an integrated process. The models of Chevaul & Depres allow the reader to form a perspective of a process that involves several steps. These generic models were specifically chosen for the layman, who does not have much exposure to concepts such as KM and CI. Another important consideration was that the researcher had to introduce an intricate concept such as KM within the scope of short dissertation. The choice of models had to give a summarised and compact view of KM.

1.6   Division of the study

Chapter 2 meets objective 1 namely a general literature overview of KM. A few practical models of KM are discussed at a level that should be understandable to the layman.

Chapter 3 meets objective 2 namely an overview of CI, a subdivision of KM. The CI process is discussed briefly whereafter the emphasis in the rest of the chapter fall on the information gathering phase.

Chapter 4 meets objective 3 namely a practical application of the KM models discussed in chapter 2 in the context of a newly established NBD SBU.

Chapter 2   **A literature overview of KM approaches**

Chapter 2   **A literature overview of KM approaches**

Synopsis

This chapter meets objective 2 namely to give a general overview of KM approaches. First the concept of KM is explained after which four models illustrate different KM approaches. Despres & Chauvel KM Mapping Model and Duffy's Basic KM Model were chosen as examples of generic KM models that represents a holistic view of KM. Max Boisot's Cultural Anthropology Model illustrates how organisational culture influences IM. The chapter is concluded with Morris, Meed & Svenson's Input-Output Model that describes the typical flow of information in an information management system.

2.1   Introduction

KM could be seen as one of the critical executive skill of this era. Knowledge of how to apply the traditional resources of capital and labour, rather than access to these resources, has become an important sustainable advantage in creating value for the customer. Successful KM refers to the ability of the executive to translate superior knowledge about the business environment, markets, customers' needs, competitors and technology into a competitive advantage by turning it into successful products, services and business processes. (Duffy 1998)

KM is mostly pursued by proactive companies who put a lot of effort into attaining and retaining competitive leadership. The leaders of such companies recognise the importance of KM for sustained enterprise viability. Important issues to companies who actively pursue KM are:

1. To create and maintain competitively superior knowledge; and

2. To make this knowledge available at points of action (POAs) to these organisations' best advantage.

Karl Wiig (1997:4) gives what he phrases as a "working definition" of KM, where he elaborates on the above two issues of, firstly, creating and maintaining knowledge and, secondly, making it available. Sustained company viability requires that the company should deal effectively with routine as well as non-routine matters to minimise costs and maximise customer success. A company should have available appropriate knowledge to meet the challenges of continually innovating and utilising opportunities in an ever-changing external environment.

Accordingly, the objectives of effective KM are to:

1. Make available the best competitive knowledge at POAs to assist employees to think and act more intelligently, and to secure the company's viability and overall success.

2. Obtain the best value from enterprise knowledge assets in other ways, such as the sale of patents and technology.

To accomplish these goals, advanced organisations need to build, organise, transform and utilise knowledge assets more effectively. The overall purpose of KM is then to maximise the enterprise's knowledge-related effectiveness and returns from its knowledge assets, and to renew these assets continuously. (Wiig 1997:4)

The infinite nature of knowledge, the fact that it can substitute for other resources, and other unique characteristics as elaborated upon in section 2.3, makes it a very difficult entity to come to terms with and to manage. Owing to these complex characteristics, no particular management approach to knowledge can be advocated. Various models for KM are provided in section 2.4, but these can serve only as directives for knowledge managers. To remove some of the ambiguity that surrounds the concept of KM, section 2.2 clarifies some of the concepts that are found in KM.

2.2 Clarification of concepts

In order to define KM further, and distinguish it from information management (IM), it is necessary to differentiate between:

- data, information and knowledge,
- and the activities which distinguish KM from IM namely that of knowledge creation and knowledge application and use.

The descriptions below indicate how the concepts of data, information and knowledge can be linked on a continuum of increasing value. This is followed by a brief discussion of KM activities.

2.2.1 Data, information and knowledge

Data form the building blocks of information, information that is assimilated and understood by people, in turn becomes knowledge.

Data

Data is merely raw text, numbers, images or sound. It has in itself, little value. Kenneth and Jane Laudon (1995:15) define data as "raw facts that can be shaped and formed to create information". Data is easy to store and manipulate on computers.

Information

Data processed and presented in a meaningful way, utilised in a decision or learning context, become information. (Jooste 1997). To the Laudons (1995:15) information is data that have been shaped or formed by humans into a meaningful and useful form. Information is also the vehicle that humans use to express and communicate knowledge in business and everyday life. (Davenport, Marchand 1999)

Knowledge

The Oxford Compact Dictionary (1997: 419) defines knowledge as an "understanding of a subject", or the "sum of what is known". Adrian Jooste (1997) gives a more pragmatic definition of knowledge, namely that "knowledge is information that is understood, and when applied, adds value to the organisation". The Laudons define knowledge more specifically as "the stock of conceptual tools and categories used by humans to create, collect, store, and share information". The great value of knowledge lies in the new ideas, insights and interpretations that are formed and applied in information use and decision making.

A further distinction is made between tacit and explicit knowledge. Radley (1997) describes tacit knowledge as knowledge "which is not explicit or codified [...] consisting of mental models, beliefs and perspectives that are so ingrained that we take them for granted and are therefore not easy to articulate". Tacit knowledge is established firmly in actions and in an individual's commitment to a specific context (craft, profession, market, etc). It is subjective and constitutes an important part of the knowledge resources of an organisation. Explicit knowledge is formal and systematic and therefore easy to communicate and share. (Radley 1997:72) Tacit knowledge is what people know and what they think, it is the knowledge that guide people's actions. Explicit knowledge is tangible and usually contained in documents and other media, therefor it is more accessible.

Data or information in itself has little value, it only becomes meaningful once it takes shape in the form of knowledge that is sharable. If knowledge in turn does not lead or contribute at least to positive actions or results for the individual and organisation it is of lesser value. Accordingly data, information and knowledge should be seen as mutually dependant elements, each building on to the other in what could be regarded the links in the value chain of KM. Knowledge is the more constant element with data and information as the variables. Knowledge can be enhanced, altered or expanded with the addition of data and information. It is difficult to determine exactly when data or information becomes knowledge, but the emphasis should be on adding value to whatever available data, information or knowledge is available in the organisation. The most important knowledge is probably in people's heads, facilitation to this tacid knowledge therefor forms an important part of KM. (Davenport 1999: 3)

In the literature the boundaries between information and knowledge are blurred and the two terms alternated. Where the literature refers to knowledge or information it will be quoted as such and, if necessary, clarified.

2.2.2 Knowledge activities

Apart from the conceptual differences in KM and IM, probably the two most important activities that distinguish KM from IM is that of:

- knowledge creation;
- and the application of knowledge.

Knowledge creation

Knowledge creation in context of business could be aligned to innovation and new - service and product development. Where a company relies strongly on tacid knowledge for long term innovation and product development it is not easy to replicate. An organisational culture that fosters proactive use of knowledge and information and promotes sharing and transparency would be a prerequisite for tacid knowledge to come to the fore. Information politics play an important role in whether such a fostering environment is established.

Knowledge application and use

KM also differs from IM in the way people apply and use knowledge in contrast to information. Management mostly pay attention to the availability of information and knowledge, but neglects to follow through on how effectively it is applied within the business context. The organisation may have all the systems and information in place, but if people do not apply knowledge to business activities and utilise it to generate new ideas for tomorrow's business, there are no benefits to the company.

IM is about collecting and making information available. It often includes information and directions on where to find knowledge and information that could take the shape of a knowledge map or an expert directory. IM falls within the sphere of the traditional role of the library. The corporate library usually creates a database where an abstract of each item (this would include books, periodicals and other publications) is entered. A thesaurus of keywords is usually created and keywords are allocated to every item so that standard keywords can bring items on a similar topic together. Traditionally the library mostly dealt with external sources of information, that had a less direct effect or impact on the business. In the past librarians may have concerned themselves to a lesser extent with the influence of information on direct business applications. In order to become KM managers, librarians will have to be knowledgeable on key business drivers and concern themselves the application of available information.

KM focuses on managing the environment that people work in. It is concerned with the interface between people and people, and people and information. KM also concerns itself with empowering people to make informed decisions that require the "right" information.

Management according to Ivancevich (Ivancevich *et al*,1994:10) refers to the "process undertaken by one or more persons to co-ordinate other persons' activities to achieve high quality results not attainable by any one person acting alone". Basic management functions include planning, organising, leading and controlling. Where the activities include tangible outputs that are easy to measure and control, the management process is much simpler. To try and manage what is in people heads is more difficult, this and other unique characteristics as discussed in the next section give and indication of the inherent complexities when dealing with KM.

To summarise it can be said that IM deals with the physical management of mostly explicit information within an organisation. It would include the first four steps of Duffy's model namely the identification, acquisition, storing and distribution of information but not does not concern itself with knowledge creation, application and use. KM includes IM but takes it a few steps further in terms of adding value to the information. KM concerns itself with the application of available information and knowledge in the organisation. It is also about managing what is inside people's heads to the extent that it wants to see that knowledge is applied to the benefit of the organisation and its long term success.

2.3 Unique characteristics of knowledge and information

The unique characteristics of knowledge and information partially help to explain their ambiguous qualities and gives an idea of KM's inherent complexity.
Knowledge is **infinite, expandable** and **self-generating**. Knowledge has its own creative energy. If utilised effectively, it offers endless possibilities for new ideas and innovations. Unlike the other factors of production it cannot be used up.

Knowledge can **substitute** for land, labour and capital. These factors of production all become secondary to knowledge. Without knowledge they cannot be turned into value-added products.

Knowledge in itself has become a commodity that has its own intrinsic value. Value is added to information by reorganising and repackaging it. Databases are developed by gathering and organising data and information into formats that can be manipulated, extracted and utilised in the business environment. Under the characteristic of being transportable the paradox of where "to much information becomes less" is discussed. Accordingly value is also added in this context through making the right information available at the right time in the desired format. Sound business decisions require reliable information about markets, competitors and so forth.

The same knowledge is **sharable** by any number of people. Intellectual assets refer to firms' knowledge, experience, expertise and other associated soft issues. (Klein 1998: 1) In an external environment which constantly demands expeditious innovations, successful companies deliberately seek out strategies which will mobilise their intellectual assets. The sharing of ideas and improval through past experience are essential characteristics of learning companies. Information technology and KM systems create the common platform that allows such sharing.

Information could be seen as the variable in knowledge, as it changes knowledge can be altered or expanded. Information is **transportable** at great speed. Personal computers have become affordable, within reach of mass markets, alongside with the development of current telecommunications networks, thus enabling the formation of what is known as the information highway. This new infrastructure equates to speed, volume and an overload of information, and it is developing ever faster. This boundless characteristic of information leads to a new paradox, where more is less. The question arises whether the vast amount of information available can be turned to knowledge that leads to better decision-making and greater efficiency in the workplace. More information generates more options and choices with greater complexity. Despite the wealth of information available, decisions still have to be made with an increasing amount of uncertainty in a world where rapid change is the order of the day. Pertinent questions are whether the information is the right

information, whether it is trustworthy, and whether vital information has not been sifted. (Morris *et al*, 1996:17).

2.4   Models for KM

In order to manage its intellectual capital more effectively, a program is required whereby a firm comprising knowledgeable individuals transforms to a knowledge-focused organisation. Such an agenda should steer the creation and sharing of knowledge across business functions and monitor the flow of know-how to and from companies. The program should bring many elements such as people, incentives, technology and processes together, in a manner commensurate with the firm's individual strategy, culture, capabilities, and resources. (Klein *et al*, 1998:2)

Various models have been constructed of how organisations deal with their information and knowledge. The following models are mentioned briefly:
- Despres & Chauvel's KM mapping model,
- Duffy's basic KM model,
- Max Boisot's - cultural anthropology and
- Morris, Meed & Svenson's input-output model.

The inclusion of these models are based on the fact that they offer a holistic approach to KM, that they come from authoritative sources and that they are presented at a level which the novice can easily follow.:
- Despres & Chauvel analysed the academic, consultancy and business literature on KM to try and make sense of the vast amount of seemingly confusing ideas of what KM is all about. Based on what they found they developed a classification system that articulates the basic assumptions beneath the rhetoric. They identified 4 dimensions on which KM activities and strategies undertaken by companies can be mapped. Their KM map is part of a Financial Times series on information management.
- Duffy's model offers a basic breakdown of KM, in easy to understand terminology. His model includes most of the components found in other KM models and can therefor serve as a useful foundation to help create a basic understanding of KM.

- Max Boisot's cultural anthropology model is incorporated because of the important role that culture play in the sharing and flow of information in an organisation.

- The input-output model of Morris, Meed & Svenson is useful in that it gives and overview of the flow of information in the organisation from a core that is known as a data-warehouse. This warehouse usually plays an important part in KM as it forms the repository of most of the information and knowledge gathered in the organisation.

2.4.1 Despres & Chauvel's KM mapping model

Despres & Chauvel (1999) designed a KM map on which companies can plot their KM strategies and programs. They undertook a research programme in which they made an in-depth analyses of all the KM literature that they divided in three specialist categories namely: academic, consulting and practitioner. Based on their research findings they developed a classification systems in which KM programmes and theories can be analysed along four dimensions namely:

1. Process

This is the result of a combination of factors that come together over time. In this model the authors adapt and simplify relevant elements from the cognition process to their KM map. The knowledge process refers to how people make sense of the universe of information around them, how they process this information and what happens to the information afterwards. The knowledge process makes up the horizontal axis of the KM map. Certain tangents point with the KM activities identified by Duffy exist, but Despres & Chauvel encompasses more concepts in the knowledge process. The knowledge process consist of 6 steps namely:

1. Mapping

People cannot deal with the whole universe of information simultaneously, instead they extract nuggets of information that they can recognise and make sense of. In effect, people and organisations map out information environments of their own making.

2. Acquire/capture/create

From the information environments people and organisations extract and recombine the most valuable information to them. This stage includes personal or organisational

routine searches which locate information that are utilised in work activities. Many examples can be quoted here, for instance share prices to work out certain financial ratios and in the IDC library all the newspapers are scanned on a daily basis in order to asses IDC's exposure in the media.for the This becomes the raw material for their work.

3. Bundle

Information can be bundled in a variety of media including paper, e-mail, voice, video and other. Before information can be bundled and made public it must interpreted and given coherent meaning. The most important issue here is what others are able to extract and that is not always a given.

4. Store

Various memory systems can be used to store accumulated information for future reference.

5. Apply/share/transfer

Data cannot be viewed as knowledge or information without a social context. KM considers the value of knowledge as the actions which arise from it.

6. Innovate/evolve/transfer

Knowledge must evolve to keep up with changes in the external environment, otherwise it loses its worth. Research and Development programmes must build on to the marketplace experience and creativity programmes should be encouraged.

2. Type

Knowledge is not a simple concept as was pointed out in the discussion of its unique characteristics. The KM field is struggling to come to terms with the ambiguous qualities of knowledge. What has emerged though is a distinction between tacid and explicit knowledge.

3. Level

In a company's context the social grouping of people can be aggregated into 3 levels namely:

an individual,

group and

organisational level.

At the basic level individuals are the building blocks of the company. Individuals normally conduct their work within a group, using the resources provided by the

organisation. In terms of KM it is important to monitor the flow of information and knowledge from the individual to the group and the organisational level. Questions that should be asked, are whether the individual's knowledge is shared with group members and the shared knowledge and experience of the group are combined in such a way that the organisation can utilise this knowledge to its competitive advantage. Ideas and critical feedback from individuals and groups should be encouraged on all aspects of the business and incorporated into new policies on a continuous basis.

4. Context

Essentially nothing in life has any meaning without context. Organisational context are made up of structures, systems and the organisational culture all which gives a piece of information its meaning. Any attempt at KM should therefor start by defining the context of meaning-making and then build from there. Common vocabulary is for instance one indicator of what is understood by individuals and groups about concepts in an organisation. The extent to which the organisation functions in groups will also determine how influential group context would be and to what the extent the individual would derive its meaning from the group. If the group outcome or results are for instance more emphasised than the individual's contribution it should also have an influence on the individual's points of reference.

In the KM map below, the horizontal blocks represents the knowledge process. The organisation can plot at which phase of the knowledge process it finds itself, or determine where it intends to go with its KM programme. The knowledge process indicates the range of activities that may be undertaken namely scanning, capturing or creating, storing or packaging, sharing or applying and transforming or innovating.. Knowledge should be applied and build upon so that it can be transformed to innovations that lead to new products and benefits to the customer. It is also in these activities that the highest value of KM and the greatest source of competitive advantage lie. Accordingly if knowledge activities are plotted on the KM map and viewed on a continuum of increasing benefits, the highest and most desirable state would be at the "apply/transfer" and ultimately "transform / innovate" range.

Each cell is divided into tacit and explicit knowledge and the whole map is embedded in context that varies depending on the level of analysis being carried out. The KM

programme could be carried out at various levels namely on individual, group or organisational level. In the instance of the NBD SBU the KM map is adapted at a group level to capture and organise explicit and to a lesser extent tacit knowledge. Organisation may find themselves at various phases and levels of this KM map. It does allow (Despres, Chauvel 1999: 6)

Knowledge process			Scan/ Map	Capture/ Create	Package/ Store	Share/ Apply	Transform/ Innovate
Context	Individual Group Organisation	Tacit Explicit					
		Tacit Explicit					
		Tacit Explicit					

Figure 1: KM Map Source: Despres *et al*, 1999:6

2.4.2   Neil Duffy's Basic KM model

The discussion is based on a generic model of KM by Duffy that was incorporated into material which comprised a book on the first Southern African knowledge management conference. Through this model Duffy attempts to bring the basic concepts of KM across to the audience. Another reason for including this model is that it also represent the basic studyfield of the researcher's occupation, namely librarianship. Unfortunately librarianship concerns itself to a lesser extent with the application of knowledge, the fifth activity in Duffy's basic KM activities.

Neil Duffy provides an easy-to-understand, yet effective breakdown of KM into:

- KM components,
- and KM activities.

KM components

Duffy (1997) regards the fundamental components of KM as:

1. **Learning organisations**

Learning people need an enabling environment which allows them to develop and grow. Organisational-culture, structure and management style, all determines the kind of environment which prevails in a business. Organisations which aspire to create an enabling environment are referred to as learning organisations.

2. Learning people

Learning people form the building blocks of a learning organisation. It is important to select people with the desired qualities, that will allow them to grow and develop in the context of the organisational culture.

3. IT

Technology is the enabling element through which people can learn, access and share knowledge. IT (information technology) allows the organisation to acquire, store, distribute and manipulate data.

4. Knowledge

Knowledge can only be grow and expand within the context of the above components.

KM activities

This model encompasses the traditional library functions but also goes beyond that to include probably the most important activity namely the application of the knowledge.

Neil Duffy identifies six KM activities in successive steps.:

1. **Identification** of information. - There is a whole universe of information out there of which the company requires only a minute amount to meet its objectives. Identification of the information which the company or individual really needs is important. To determine which information is necessary and which is not is a complex assignment, but one which is vital to successful KM. In the library environment the librarian would scan through all media including trade journals, newspapers, book- and journal catalogues for announcements of books, conference papers and new journals. Brochures would normally be circulated to relevant parties for consideration. It is important to distinguish between what information or publications (in particular journals) the company should receive on a regular basis and information that is only required for a particular decision occasional request. CI could be an important tool to assist the company in

identifying what information it needs to monitor its competitive environment on an ongoing basis.

2. **Acquisition** of information. **Acquiring** the information that is necessary and available is the second activity. In corporations with libraries the librarian would normally take on this function. In the case of regular publications (like journals), subscriptions usually have to updated on an annual basis. The librarian would normally undertake to renew these or alternatively subscription agents such as EBSCO in South Africa could also do it on behalf of the company at a cost.

3. **Storage**. Once the information has been acquired it has to be **stored**. Depending on the format of the information it is usually stored in databases or, if on hard copy, in a central facility such as a library.

4. **Access**. Information has to be **accessible** when required otherwise it cannot be applied, and it is the application of knowledge which determines the ultimate success of the company. Information that is not distributed to the people as and when they need it is of little value.

5. **Distribution**. Electronic channels can be utilised for the **distribution** of information. An example of such an electronic channel would be e-mail packages that make it possible to deliver documents instantaneously. On the Internet it is possible to download files from any website.

6. **Application**. Knowledge and information that is not applied in the business context to deliver new or improved products and services to clients, is of little value to the business.

7. **Destruction**. Storage space is limited and therefore information that is no longer used should be deleted from the database regularly. Out-of-date information clogs up the system and takes time to sift through once retrieved. In library terms this process of cleaning is known as "weeding". In order to keep the library collection tidy, current and relevant, weeding is done on an ongoing basis.

To maximise the enterprise's knowledge-related effectiveness, management should look at all the elements of KM, namely learning organisations, learning people, and knowledge and information technology, to form a holistic view of where they find themselves in terms of their knowledge-related capabilities

(Duffy 1997:20)

2.4.3 Max Boisot - cultural anthropology

Max Boisot places information within the framework of the organisational culture. He defines culture as "involving the structure and sharing of information within a given social grouping". Each organisation has its characteristic behaviour, ideas and values gained from past actions and experiences which will influence future actions. Boisots' model is built around what he calls "C-space", which stands for culture.

In Boisot's model the fundamental characteristics of information are the extent to which information is:

- Codified - highly codified information is only understandable to those who know the code. Examples could be financial terms used in the company's annual report, or the computer department using highly technical terms to describe relatively simple processes.

- Diffused - widely distributed information that is publicly available. To the other extreme is undiffused information unknown to most people.

Within this "C-space" the information is defined to the extent that information is codified or diffused.

The model provides a useful insight into how accessible a company's information is. Bureaucracies are inclined to use codified information, incomprehensible to outsiders. By using clear simple language and avoiding unnecessary technical jargon a company can ensure that reports are understandable to all stakeholders of the organisation. A free flow of information is necessary for establishing a culture of information-sharing and creating a knowledge-rich organisation. (Morris *et al* 1997:56)

2.4.4 The input-output model of Morris, Meed & Svenson

The focus of this approach is a data warehouse through which all information in the company is channelled. A data warehouse refers to a complete historical database of a company's business. The PC Webopaedia (http://webopedia.internet.com) refers to a data warehouse as a collection of data designed to support management decision making. It contains a collection of data that present a coherent picture of business

conditions at a single point in time. A data warehouse consists of systems that should also be available to extract the data from operating systems and a warehouse database system that provides access to the data. With data warehousing many different databases are combined across an organisation to give users access to a variety of databases. Although expensive to establish and maintain, a data warehouse offers significant benefits to a company. The following benefits are the most important:

- It projects an up-to-date, consistent, and accurate set of information to customers, management and the company as a whole.

- It stores and uses in a flexible and efficient way the information that the organisation generates and receives.

- It uses both people and technology to handle and synthesise this information.

- It utilises up-to-date technology to provide fast and efficient delivery of information.

- It brings all the company information sources together efficiently.

- It provides current tools to enable staff to use the information.

- It replaces the mountains of paperwork with an effective storage mechanism through which data can be stored, retrieved and manipulated.

The objective of this model is to monitor the flow of information into and out of the organisation. It follows the way raw data comes into the organisation, and analyses how it can be turned into useful knowledge for users and how best to deliver it to users in the format they require.

(Morris, *et al,* 1997:66)

Components of the input-output model

The following are the components of the input-output:

- the generators of information,

- information workers (people),

- a warehouse,

- and delivery channels.

These components should be analysed and broken down into further subsystems. Such an analysis can provide all the detail necessary to build a model of the total flow of information in the organisation. Each of the components is discussed briefly below:

Generators of information

Any source or supplier of information becomes a generator of information. A distinction is normally made between external and internal sources of information. Generators of information may include, too name but a few;:

- databases held independently,

- the media,

- management information

- and information generated internally by various departments.

Each of these generators of information are briefly discussed below and where applicable references are made of how the IDC library deals with its information.

Databases maintained and developed by vendors of specific types of information, to which the company subscribes. The IDC library subscribes to quite a number of databases. For financial analysis IDC uses McGregor BFA, a database that contains the annual reports of companies listed on the Johannesburg Stock Exchange (JSE), for marketing data Profound, and various CD ROMs for company- and other market-related data.

The media. The IDC library scans the major newspapers including Business Day, Star, Beeld, Citizen and Sowetan for any articles on the IDC and its business interests. Media cutting files are compiled from newspaper and journal articles and various other sources of information, covering topics of interest to the IDC. Industry trends can be followed in these files. The media cutting files are considered to be the most useful source provided by the library.

Another similar service which the library subscribes to is Stockpress, which covers all the JSE sectors and all the listed companies. All the important newspapers and industry journals are scanned for articles and filed afterwards in files according to the JSE sectors.

Before IDC grants money to companies, investigation teams made up of the financial, marketing and technical departments have to assess the viability of the application in terms of the existing business and proposed expansion plans. The marketing person who has to assess the potential and existing market obtains the necessary background material from the library. Typically, manufacturing statistics, imports and exports, or information on other companies in the same industry and relevant journal articles are utilised to determine the market size.

Information is supplemented by industry yearbooks, specific market research reports and various online databases. The major problem encountered is the lack of marketing data in some industries, as industry associations are at times reluctant to disclose information to non-members. Information which the library has gathered for various projects in different industries is kept on file. The library also keeps its patrons up to date regarding ongoing projects.

Management information refers to market reports, briefings, and treasury documents. This is normally the type of information that would land up with middle and senior managers. When a market research plan is developed, the primary and secondary sources of data are specified. Primary data are data specifically collected for a particular research project or purpose. To collect primary data is more expensive and very time consuming. If available, it is much more cost-effective to utilise existing market research results. Secondary data are data that already exist and were collected for another purpose. Secondary data would include all the above-mentioned generators of information, including databases, the general media and market research reports.

Information generated internally that could include brochures, reports and any other types of documentation generated internally.

Information workers

People should be in place to gather and organise both internal and external information. They should act as liaison officers between the technology and the generators of the information. These information workers should collect and sift

information from all departments on a regular basis. Once the information has been collected, it should be prepared so that it can be entered into the warehouse in a consistent format.

These information workers should have certain key characteristics:

- They should understand the importance of knowledge as a key asset of the organisation.
- They should not be afraid of new technology and be able to use it effectively.
- They will be learning people, constantly upgrading their knowledge of technology and always staying abreast of new trends in the wider marketplace.
- As coaches, they must have the ability to communicate their knowledge of information and information systems effectively.
- They will be effective members of self-management teams. No one can operate effectively on his or her own in the new fast-delivering information infrastructure. Too much information with an increased level of uncertainty has become available for one person to deal with singularly.
- They should be hunters and gatherers of information. They should know where to obtain relevant information and make sense of it once it has been received.
- Confronted with the new uncertainties, they should be able to make effective decisions in the face of an avalanche of information.

(Morris, et al, 1997:19)

Librarians or information officers have extensive exposure to information and sources of information that would allow them to develop many of the above attributes. They certainly stay abreast of new developments through extensive contact with vendors of information and were in the forefront with utilising the internet. They have always been keen on networking with colleagues to share and utilise sources of information. It is expected of them to act as the mediators between information and the user and they are certainly able to communicate their knowledge of information and databases effectively. They have always been hunters and gatherers of information and would to know where to obtain relevant information. often have to run one-man libraries in the context.

The data warehouse

The warehouse is a powerful database. It could include text, brochures, pictures, forms, letters and the like.

The delivery channels

There are a variety of vehicles available to get the relevant information to the customers. The Internet and intranets have various formats in which to present the information to the user. Most of the packages can interact with one another, which makes it easy to translate and interchange data from different packages. E-mail offers a cost-effective and easy way of sending data files to users. Files can be downloaded from the internet and sent via e-mail.

This program can only work if the organisational culture supports the free sharing and exchange of information. Users should know what information is available, people should be prevented from hoarding information and good search engines should be available to extract information from the data warehouse.

The input-output model advocates a systematic approach according to which it strives to bring all the information in the company together in one central data warehouse. It should be a useful methodology to use when the company wants to analyse and organise all the information generated in the company. (Morris, et al, 1996:65-72)

2.5 Evaluation of the models for Information and KM

It is impossible to single out a best information management model to follow. Each organisation's circumstances and needs vary too much. At the individual organisation's level the executive should possess the necessary understanding of the nature of his business that he should be able to make an important contribution to the development of a KM system be best suited to his company. The chosen models in this overview of KM should assist the executive in gaining a basic understanding of some of the key concepts in KM.

With Despres & Chauvel's KM map any company can plot their KM program. What are important to the authors are that companies should realise that there are many

dimensions to KM. Companies may be under the impression that once they have established a data warehouse or addressed the technological aspect of KM they have an adequate KM system is place. On the KM map companies can plot where they are currently and where they want to go with their KM programmes and systems, bearing all the dimensions of KM in mind.

2.6   Conclusion

The unique characteristics of knowledge as elaborated upon in section 2.2.1 especially its infinite nature makes it complex to manage. Morris, Meed & Svenson (1997:55) refers to the information management models in section 2.3 as "models in the sand". The speed of change is so great in the information world that any model runs the risk of being out of date even before it is published. Regardless of the management techniques employed, the ultimate goal should remain that of Karl Wigg namely to maximise the enterprises' knowledge related effectiveness. In order to achieve this goal a whole new mindset is required, management should realise that computers have become the environment in which businesses operate. The ultimate success of KM strategies depends on the support and attention it receives from top management. Once their commitment is secured, a suitable KM program can be developed.

The KM map of Despres & Chauvel's provides a model that can used by management to form an overall assessment of where the company finds itself with its KM programme. At the same time the model can also help management to form an idea of where they want to go with such a programme. Duffy's model builds an understanding of the activities involved in KM and Morris, Meed & Svenson's model gives an example of how KM is applied in a more practical model.

Chapter 3   Overview of CI

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3.1   Introduction

CI and business intelligence (BI) are subdivisions of KM. KM refers to the way organisations create, capture and reuse knowledge to achieve organisational objectives whereas BI and CI deal more specifically with gathering and processing of external information. BI embraces CI but it also includes information about industry conditions, political situations and internal operations. (Neethling: 1999) CI is a focused type of KM which analyses competitive forces. It is the collection and analysis of public information to gain an understanding of a company's competitors, customers and markets. Companies that employ CI to anticipate external forces can prevent endless ill-advised decisions, save millions of rands and obtain advantages over existing and future competitors. CI can help companies to create a thorough understanding of the competitive environment and gain knowledge to recognise and act on opportunities. (Breshnahan, 1998)

The Society of Competitive Intelligence Professional (SCIP) defines CI as the legal and ethical collection, analysis, and distribution of information regarding the competitive environment and the capabilities, vulnerabilities, and intentions of business competitors. (http:://www.scip.org) Calof gives a working definition of CI as " actionable recommendations arising from a systematic process involving planning, gathering, analysing, communicating intellligence and managing the information on the external environment for opportunties, or developments that have the potential to affect a company or country's competitive situation". (Calof, 1999)

Despite the obvious advantages that CI offers, few companies utilise this powerful yet simple strategy. Companies invest millions in Lotus Notes and other intelligence tools but if vital information is not channelled to key decision-makers these tools tend to become expensive white elephants. (Breshnahan, 1998) CI is also mostly under-utilised by South African companies who apparently know little about how to use and analyse information in order to gain competitive advantage. Information may be gathered but companies fail to analyse and convey it to top management. This is how Calof sees the local business community's information capabilities. Companies should realise that there is public information available from which competitive advantage can be gained. Companies have interesting bits of

information of which nobody can determine the value. It is the systematic analysis of this information, which is important to determine the future actions of government, competitors and customers. According to Calof an ever-increasing amount of companies' success in future will depend on CI. In America approximately 60% of the companies have CI units whilst Japan has used CI since the 1960's. (Cloete 1998)

It is difficult to get information on how companies use CI to get ahead. Very few companies would admit that they gather CI, let alone reveal their competitive strategies. Other companies confuse CI with industrial espionage and are afraid that they will break the law if they gather CI. CI is not taught at business schools or regarded as a management discipline. It requires a different outlook to that of the analyses of historical events and annual reports most management is accustomed too. With CI management must make decisions based on what may happen. Executives who are risk adverse will find this type of decision making, which is filled with uncertainty, exceedingly difficult. Other executives reject CI because they don not want to change the way they are doing things. In the past executives could base a lot of their judgement on previous experience but this is no longer the case. With the impact of IT and globalisation business environment changes so quickly that past experience is not as valuable anymore. (Breshnahan, 1998)

Section 2.1 of this chapter deliberates on the specific uses of CI. Section 3.3 and 3.4 give a breakdown of the typical steps in the CI process with a detailed discussion of the planning and information-gathering phase. CI is also included in chapter 4 section 4.5 as one of the tools available to the NBD SBU in order to devise an information management and KM strategy for itself. As a librarian the researcher is mostly involved with the planning and information gathering phases of projects. CI gives a different perspective to the collection of information and should help the librarian to form an better idea of what type of information to look for and how to organise the information in a different framework.

3.2   Uses of CI

Frederick the Great said "it is pardonable to de defeated, but never to be surprised". CI creates an awareness of the whole business environment, which enables leaders and strategic planners to stay abreast of current events, and future trends, and accordingly eliminate surprises. (Schoffro & Cook, 1998: p.45) Although an invaluable tool to monitor competitors as indicated by the definitions above, CI offers much more. It can be used to gain insight into any key business function. It can help to explain the motivations of existing and potential clients; help to identify why an account was lost, help to identify key service drivers, increase market share and develop niche markets. Furthermore CI can be utilised to determine the best time to launch a product or service or to find more effective marketing techniques. (Schoffro & Cook, 1998: p.44)

One of the most important contributions CI can make is probably in the area of mergers and acquisitions (MA's). (Lisle & Bartlam, 1999) Within the framework of the CI process MA's can be systemised into four phases:
1. market entry,
2. search and screen,
3. due diligence
4. and negotiations phases. (Lisle & Bartlam, 1999:30)

At any point in all the phases of the MA process CI can provide a holistic insight into the factors at play.:

Market Entry

At the market entry phase the following should be established: what competitors think, threats, competitors responses and the intentions of new competitors.

Search And Screen

At the search and screen phase for possible MA's, attention should be paid to the fit of the company's' strategic goals, description of the market of interest, finding the right candidates, reasons for willingness to sell and customers perceptions of the products, prices and values.

Due Diligence

At the due diligence phase CI can be utilised to identify the financial and investment pitfalls. Important questions like what the future capital investments would have to be, can be answered by looking at the productive life of industry's equipment; the maintenance cost thereof, the state of the art on information systems, and authoritative estimates of replacement costs.

Negotiations Phases

Competitor analyses assists the analyst in making predictions around these future investment requirements. The well-prepared buyer approaches the negotiation table with detailed information independently compiled regarding future revenue growth, expansion of margins and cash flow generation. Benchmarking, one of the important analytical tools of CI, adds to the information the buyer needs to reject or accept the validity of the seller claims. (Lisle & Bartlam, 1999: 28)

3.3 CI activities

CI is focused, disciplined information collection. To locate information is easy, but to find information that is useful and facilitate effective decision-making is more difficult. The first step is to know what information is needed, to know where to find the best information is next, but to know what to do with the information is everything. CI can be seen as a systematic process that converts bits and pieces of competitive information into strategic knowledge for decision making. (Schoffro & Cook, 1998: 45)

According to Gareth Ochse (1999) of Bain and Company "careful planning reduces errors and 'yield loss' in all other phases of the CI cycle". Ochse suggests the following as a desired time allocation for CI activities: management (10%), planning (13%), data collection (36%), information analysis (29%) and intelligence communication (12%). Currently close to 60% of the CI practitioners in North America's time is spent on information gathering. CI experts feel that no more than 25% should be spend on information gathering. (Schoffro & Cook, 1998: p.45)

Rather than to collect information blindly and waste valuable time it is advisable to design a framework such as a life cycle model or a performance matrix, on which to hang the information first. Such a framework will determine the type of data that is needed and thus guide the researcher through the overload on information that business is confronted with. It is important to know the knowledge resources, and to know which research techniques were employed in compiling the market research reports.

3.4 Answer-first approach

Ochse (1999) says that in essence two approaches are used to solve complex business problems: the "answer first" vs. the diagnostic approach. The "answer" approach are mostly more effective (90% of the time) but can be self-fulfilling and new insights may be missed. This approach is difficult to use where no clear hypothesis and no previous experience exist. The "answer-first" process should lead to a hypothesis. The rationale behind the "answer-first" approach is that the research should be specific, with a sense of direction. Once specific problems are identified it allows the researcher to ask the right questions and collect appropriate data to answer those questions. The diagnostic approach builds background data and context effectively. New insights may evolve from which broader and strategic issues may be identified. The problem with the diagnostic approach is that it explores all the issues around the problem, the key questions are only discovered along the way. Accordingly no hierarchy of questions or issues are formed which makes it difficult to prioritise the analysis.

3.4.1 Answer-first key steps

Situation   - Describe the background of the problem.
⇓

Complications   - Define the major problems and constraints facing the analysis
/constraints
⇓

Critical Question   - Formulate the primary question to be addressed by the analysis.
⇓

Hypotheses/   - Answer the question to resolve the complications. Each hypotheses
Answer   should be supported by a "logic tree".
⇓

Primary   - Key assertions, which prove the hypothesis, should be mutually
assertions   exclusive and collectively exhaustive
⇓

Secondary   - Facts should verify the primary assertions and be explicit enough
assertions   to translate into an effective presentation.

The answer first approach is used to clarify the most important issue to be addressed in the case. The facts and background information are assessed first in order to form the hypotheses. The investigation should address the client's question and lead to an understanding of all the components of the question. The hypotheses should be formulated early on and assertions should be made to test the hypotheses. The tasks in the research process should be linked to the assertions. From each answer, primary, secondary and tertiary assertions are made on which the logic tree is build. It is only after the required analysis has been determined, that a decision can be made regarding the type of data that should be collected.

3.4.2 Forming the initial hypotheses

Ochse gives useful guidelines on how to start with the CI process which could otherwise be a rather daunting assignment:

1.   Determine the focus

It is important to get the focus of the analysis right by asking relevant questions such as what decision is the client trying to make. The potential options available to the client should be identified. These options could include to expand the business, or to diversify, to buy or to sell or other.

2.   Utilise previous experience and the best available facts

All the previous experience and the best available facts should be utilised. Questions to ask are whether this type of work was done before, who the experts are and what approach was adopted in the past.

2.1   Make analogies where possible:

Similar companies could be used to for comparisons in terms of cost - and other ratio analysis. Secondary research should be scanned for insights it may offer on the company's market or industry. Information from other industries often provide useful background material and can be applied to determine market size, threats to the industry or other factors which may be have an important influence on the well being of the company's particular industry.

2.2   Interview external experts early on:

External experts should be interviewed and primary data collected in the early phases of the investigation. It is often necessary to prove management wrong who rely heavily on past

experience and have lost tread with industry realities. Own observations on clients, products, operations, etc and what the facts say should be considered here.

3.   Simplify the initial phases of the investigation.

Lists should be compiled of potential hypotheses rather than too define the hypotheses too narrow, a more exploratory approach should be followed here.

4.   Engage the client and the research team

Techniques such as brainstorming, the analogies/metaphors, the interrogatories (who-what-where-when-why-how), problem reversal and others should be employed to tap the rest of the team for additional opinions, facts or hypotheses. The hypotheses should be validated with the client who may have facts or assertions, which could prove the hypotheses wrong.

3.4.3   Collection constraints

- **Time**: It is important to know the time frame of the whole project and how much time is available for collection of information. There could also be a trade off between time, quality and the comprehensiveness of the information gathered. Information on the Internet is often free but the quality may be suspect and it is time consuming to wafer through pages of irrelevant references. Qualified sources from recognised vendors of information are expensive but save the user time and usually provide value-added information. Researchers are often reluctant to spend money on information and expect the information officers to find free information on the Internet. Unlike databases, which are designed for extracting the information afterwards, the Internet does not offer such an organised collection of information. Advertisements and duplication of references are intermingled with the quality information, which are often only available at a cost on the Internet.

- **Money**: Quality information costs, direct research is more expensive therefor it is important to establish if previous research (secondary research) exists on a subject. The budget should also provide for market or other information research that may be needed for the project.

- **Size** and **experience** of project team.

- **Geographic location**: The geographic location is important in terms of defining the scope of the project. For market research the criteria that will be used in overseas market research

will differ in some aspects from for instance the criteria for local markets. Markets may for instance be more quality than price sensitive, or cultural barriers may hinder the acceptance of specific products.

- **Availability of secondary data**. This refers to data that was already collected for other purposes. Central Statistics in South Africa is responsible for the collection of various economic and other vital statistics in South Africa. This data is essential for any macroeconomic analysis as well as more specific sectoral forecasts, but is regarded as unreliable by many market analysts. The lack of market research in South Africa often prohibits effective market analysis in terms of market quantification and other strategic market issues. In South Africa there is less secondary market information available than in industrialised economies like the USA. The government of the USA gathers detailed statistics of the manufacturing activities of their industry, which are available on the Internet free of charge.

It is unfortunate that less information is becoming available especially at a time when the SA economy is opening up to the rest of the world. It is important for potential overseas investors to obtain information about a market which is foreign to them and of which they have little experience. Central Statistics have ceased quite a few of their news releases such as the vehicle licenses issues in the different provinces or retail prices. In future these statistics will only be released at great cost to the purchaser. Another example is the 1996 population survey, of which central Statistics have only released a summary, the detailed survey is only available in a database format at a great cost of thousands of Rands. The population census is of course the sort of data that is necessary for market research in the retail and other consumer industries as well as service industries. The IDC brought out a publication "Prospects" in 1998 that covered 70 odd industries in SA and gave the manufacturing statistics, imports and exports as well as the threats and opportunities for each industry. The intention was that "Prospects" would be updated on a bi-annual basis, but sadly IDC management decided to discontinue the survey.

The reasons that are given for ceasing these sort of publications is mostly cost-related. This is the sort of information that is desperately needed by industry to make well-founded business decisions regarding plans to expand or to deal with strategic business issues and

long term planning. Where market research is available it is very expensive and at times difficult to obtain. The Buro of Market Research and similar institutions bring out good market research, but it is expensive and therefor out of reach for the ad hoc enquirer or small business with minute marketing budgets.

- **Size and complexity of industry**. Some industries have a complex structure, like the Information Technology (IT) industry. The IT market can be subdivided into many different sectors ranging from the personal computer market to networks. Without operating systems and dedicated software developed for unique applications computers cannot function, accordingly numerous software development specialists and vendors have sprung up. With the IT industry different valuation criteria are used, software development relies on the intellectual capital of individuals in companies. It is always more difficult to place a value on intangible assets like information, knowledge and intellectual capital. Computer systems are quite complex, accordingly a whole infrastructure for training and support developed into an industry which is much larger than the manufactures of the equipment itself. It is very difficult to analyse such an intricate industry, which branches out into so many fields. The IT industry develops so quickly that it is difficult to monitor the all the developments and change in the industry.

- **Law and ethics**. There is a fine line between industrial espionage and CI. All CI practitioners adhere to a strict code of conduct that prohibits the gathering of information through illegal means or false pretences. It would for instance be regarded as industrial espionage if an employee of a competitor is bribed to reveal details of a new product to be released by the competitor. Another example of unethical behaviour would be to interview an ex-employee of a competitor where the CI practitioner does not reveal his purpose prior to the interview.

3.4.5   Probable information sources

The complication here is that each project is unique and accordingly the information sources that will be utilised will vary. In general Ochse gives the following as likely information resources:

- Internal sources: project team, client and beyond
- Secondary information from databases and press. Information can only be utilised once it is made accessible to the user. It is of little use if it is not retrievable and available when

required. Value is added to the extent that the information is organised and structured Existing information centres and libraries collections do not cater for the diverse information needs of small business. The heterogeneous background and training of businessmen create certain problems in finding relevant information for this group. (Pistorius 1989) The relevant information required does exist to some degree, but it must be brought together and made accessible according to the needs of the small businessman. It is evident from outside enquiries that it is difficult for small business to gain access to information sources

- Industry experts and the target itself.

In essence it is the IDC library's main function to assist investigation teams with market research information. This information help them too ascertain each proposed client's application (which is mostly expansion of production capacity) or project's individual merit.

The answer-first approach should offer some useful ideas that the NBD SBU would be able to apply in in the information collection phase of specific research projects. The IDC research teams usually adopts an exploratory approach, especially in the pre-feasibilty phases of projects. The problem is that there is no specific methodology beyond the exploratory phase. CI should make the NBD SBU aware that there are other approaches to follow. It would be useful to the NBD SBU to at least consider aspects of Ochse's methodology in research projects.

3.5   Conclusion

CI offers a systematic approach to gather information on the competitive external environment. Rather than to gather information at random and build a broad background on industry developments, CI advocates the monitoring of the competitive environment in a more conscious, organised fashion. The CI process is quite specific in that the need for CI should be addressed first before data is gathered. The data is then synthesised and meaningful conclusions drawn that can be utilised in the decision making process. In the answer first approach Ochse also stresses the importance to be specific and to establish the purpose of the information collection and questions first before collecting data.

At IDC investigation staff were expected to investigate applications from any industry. Accordingly staff were use to adopt a more exploratory approach, with the idea of gaining a brief and broad background on industries. With the restructuring of IDC into industry specific SBU's, staff will have the opportunity to become knowledgeable in a specific industry. Once staff have developed a knowledge base they will probably be more specific about what they want to monitor in their particular industry. In the case of specific investigations they should also ask particular questions like specific market share or market size. CI is one methodology that can link the gathering of data, with specific research questions.

The information officer should also be aware of research methodologies such as the answer-first approach. The information officer should be able to utilise some of the methodology in the reference interview and later on in information searches. The information officer can help the client to formulate his information request better by being aware of aspects such as the background situation to the research problem, collection constraints, and the formulation of the research question.

Chapter 4   A KM and CI strategy for a Technology Finance SBU

Chapter 4   A KM and CI strategy for a Technology Finance SBU

Synopsis

Chapter 4 meets objective 3 in that it gives a practical application of the various models discussed in chapter 2. The NBD SBU is mapped on Depres & Chavel KM Mapping Model to give the SBU an overall perspective of where they are on the map and how they can develop their KM programme. Duffy's Basic KM Model and Morris's Input – Output Model are used to list the sources of information on the IT industry and can provide a framework within which the SBU can plan and monitor the flow of information and knowledge and consolidate it in a database. A CI strategy is briefly mentioned for the NBD SBU to consider in future.

4.1   Introduction

In this chapter Despres and Chauvel's KM Mapping model and the Input-Output model as discussed in chapter 2 are applied in the context of an IDC SBU namely New Business Development. With the restructuring of the IDC into industry specific SBU's the way IDC deals with its knowledge and information are going to change significantly. One of the reasons why IDC is restructuring is to build up and maintain industry knowledge within SBUs. This will enable the SBU members to become familiar with the structure and the forces at play in a specific industry. Through gaining knowledge and understanding of a specific industry each SBU could take the knowledge map to its highest level namely of transform and innovate. In practice these innovations could take the way of designing new financial packages and schemes tailored to the specific needs of a particular industry. The Input-Output model provides a practical approach to organise and deal with the physical information.

The IT industry is a high technology industry, which comprises a diversity of electronic components, products, networks and services that are highly integrated. Traditionally the IDC financed projects with a manufacturing focus, where the focus is on capital goods. IDC has less experience of technology projects where intellectual

capital is the driving force as would typify the IT industry. It could be said that this SBU has in more than one aspect a more complex assignment than the other SBUs that are based on less intricate industries. Firstly it has to familiarise itself with an industry that the IDC has had less exposure to and to add to the complexity it also has to deal with an intangible concept such as intellectual capital which the IDC has traditionally excluded from budgets. The rewards on the other hand could also be greater, this is a high growth industry with much more opportunity than the more mature manufacturing industries.

As the SBU is starting afresh it has the opportunity to plan the way it is going to manage its knowledge and information from the beginning. The KM mapping model could help them to gain a better understanding of where they are in the value chain of KM and where they see themselves in the future. The Input-Output model provides a practical approach to organise and deal with the physical information.

To devise a CI strategy is more complicated since the main question is to establish what you want too know first before devising a strategy of finding it. At this phase the SBU is still familiarising itself with the industry before it can actually identify the key issues of relevance to it

In this chapter the NBD SBD are firstly mapped on Despres and Chauvel's KM Mapping Model, after which an information needs assessment is discussed. Finally an Input-Output Model and Duffy's Basic KM Model are incorporated to serve as a suggested framework for the NBD SBU's KM and information management strategies.

4.2   Despres and Chauvel's KM mapping model

Despres and Chauvel's KM Mapping model are used below to provide a general guideline for analysing the potential KM activities of the NBD SBD. The goal should be in the long term to transform and innovate with the knowledge obtained in the earlier phases.

Context Levels	Scan/ Map	Capture/ Create	Package/ Store	Share/ Apply	Transform/ Innovate
Company	**Tacit**				
	Company culture				
	Explicit				
	External environment	Broad strategic issues	Processing of information	**Vision** Business strategy Mission	Product development
Group	**Tacit**				
	Culture Knowledge			Information knowledge and experience	techniques to transform new ideas and innovations
	Explicit				
	Published information sources BMI Techknowledge dge Other generators of information	Reports compiled Guidelines /bounda-ries Industry specific KPA's Major growth areas	Group database Contacts database	Current clients Future projects	

	Scan/ Map	Capture/ Create	Package/ Store	Share/ Apply	Transform/ Innovate
Individual	**Tacit**				
	Culture Anything that builds internal knowledge of the IT industry	All knowledge gained but not captured		Informal meetings	
	Exposure to clients, and industry				
	Explicit				
	Published information sources Other generators of information Topic specific for particular job requirements	Reports Contacts and personal informat-ion sources	Group database Contacts database Personal files	Reports Informal meetings Decision making	

Figure 2: KM Map adapted taken from Despres *et al*, 1999:6

Each of the above levels of company, group and the individual are discussed in more depth below. The NBD SBU is used as a practical example and the emphasis of this discussion falls on the flow and management of information and knowledge in the

particular SBU. It also illustrates how the SBU may interact at the company level in the various phases of the knowledge process as discussed in chapter 2.

4.2.1 Company level

Culture

Max Boisot's Cultural Anthropology model in chapter 2 section 2.4.3 provides a useful insight into how accessible a company's information is. Bureaucracies are inclined to use codified information, incomprehensible to outsiders. By using clear simple language and avoiding unnecessary technical jargon a company can ensure that reports are understandable to all stakeholders of the organisation. A free flow of information is necessary for establishing a culture of information sharing and creating a knowledge-rich organisation.

(Morris *et al* 1996:63)

Strategic vision

Vision refers to a desired state in the future where the company would like to see itself. This implies that management has to take cognisance of the company's existing situation before they can devise strategies to reach the desired state. Vision has a future orientation and therefor strategic implications. Accordingly strategic vision can be seen to encompass and form a framework for the company's mission, objectives and strategies. Strategic vision takes along term perspective where the projected period can be anything between five to ten years or longer depending on the nature of the industry in question.

Typical issues that should be considered before formulating a company's vision include:
- future industry trends
- key success factors that can be foreseen
- technological developments and
- who the competitors in the future will be.

It clear from the above factors that a company's success will depend to large extent on its ability to translate future developments and demands of its external environment into its strategic vision. (De Bruyn & Kruger 1994: 19)

Mission

The mission reflects the company's main reason for existence i.e. that it should deliver a product or service that meets a specific need of a specific market segment and in this process maximise the shareholder's interests over the long term. (De Bruyn & Kruger 1994:25) The vision and mission are formulated explicitly and advocated within a company but the company culture is the more intangible concept of the three concepts. The company culture could either inhibit or facilitate the mission and vision. Management should be aware of the prevailing company culture and if necessary change it to facilitate the vision and mission.

Environmental scanning

The enterprise and its environment are dependent on each other for their survival. The business has to source all its input including labour, capital and raw material from its external environment. In turn the community is reliant on the enterprise to satisfy its needs for products, services, job opportunities and so forth. Knowledge that it will change, is the only given, in the external environment. Change implies a movement from the known to the unknown, and the predictable to the unpredictable. Change is a process of constant renewal and could take place in any conceivable sphere of society impacting on every aspect of the environment the business has to operate in. Depending on how the business adapts to change it can offer either an opportunity or pose a threat. (Cronje *et al* 1995: 31)

Environmental scanning, through which the enterprise gathers information on its external environment should take place on an ongoing basis. It is imperative for business to know about change in the external environment in order for them to know how to react. Environmentally scanning is done through utilising all the external sources of information available. These sources include newspapers, trade journals, conferences, the Internet, online databases and other sources of information.

4.2.2 Group level

The group level in this instance is the new SBD SBU. It is newly formed and has been given the opportunity to develop its own inherent culture albeit within the broader framework of the company's culture. Fortunately the people in the group share the same kind of work ethic, and have the necessary experience, that should allow it to grow and survive in a very competitive external environment. The IT industry is highly complex with many components, variables and factors that should be monitored on an ongoing basis. It is a dynamic and yet volatile industry with new technology and improvements introduced on an ongoing basis.

The NBD SBU has two applications for information namely:

1. current client applications

2. and future project applications.

For the current client applications specific type of industry information around the product is required. The reliability and completeness of the facts and information provided by the client will determine the extent that the investigation officer will have to verify the client information. As the SBU familiarise itself with the IT industry and build its knowledge base, the need to do initial industry research should diminish.

More research is required for projects, especially in the case of new products with no prior history to base assumptions on. The risks are much higher and therefor as much as possible should be learned about the potential products and markets. The venture capital industry offers high rewards but is also a high-risk industry to be in. In order to reduce this risk it is imperative to ensure that all the existing experience on the topic whether it be in written format or industry contacts are tapped. A more exploratory approach is usually adopted in the beginning of projects at the IDC. Once the researcher has developed a broad back

The SBU is limited to the extent that it can innovate or transform. It works with known financial instruments, which can only be manipulated and adapted to clients needs in a number of ways. What was decided however is that the following aspects would be monitored and improved on an ongoing basis:

- status of applications (scheduling of investigation dates, the stage of the investigation cycle that applications are in, etc.),

- Key Performance Areas (KPA's) for the industry,

- a return loop to re-evaluate sources of information, KPA's and refine criteria used to assess companies and projects and

- exception reports.

As the SBU gains experience and expand the contacts and group databases of the industry an effective knowledge base should develop that will allow various types of analyses. The SBU should be able to monitor various key financial ratios, evaluate the sources of information (including BMI-Techknowledge overview of the IT industry) and determine whether they use the appropriate analyses to determine the viability of potential projects and clients.

4.2.3 Individual level

Individual staff members will be given the opportunity for the first time to build their own knowledge bases on specific industries. In the case of the NBD SBU it will be the IT industry. The extent to which they will share the knowledge they gain will be through either informal meetings and more formally in reports. They will be the contributors to the group-and contacts databases. The application of knowledge and information will be the same as in the group context namely for future projects and applications for finance. When in doubt, decisions that are made should be based on facts from independent sources. The investigation staff rely on the library for information searches on published literature to validate facts or provide a basis for assumptions. Most of the staff members are experienced researchers (in the context of doing research and writing reports for IDC). They know what information to look for and how to incorporate the knowledge and information gathered into their reports.

4.3 Business information need's assessment

At this point it is important to conduct an information needs assessment. This assessment should establish from the user what information they think they would need, to perform their duties. Such an assessment gives the information officer a feeling for the nature of the information queries she may get and the type of information resources that she will have to purchase to answer those queries. It also helps the user to articulate his information needs, which he may not have given much thought too.

A few classifications of business information needs found in the literature are given below.:

Du Toit and Terblanche (1996) give a broad overview of the information needs of business and points out that they differ a great deal from those of researchers or academics. In business sophisticated decisions are made on a daily business. In order to make plans and projections for the future, relevant and accurate information are required. There is a growing need for operational knowledge yet people don't know what information is available or where to find the information. She found in her research that businessmen are inclined to make use of personal contacts before they consult published sources of information.

Pistorius lists various requirements for business information in order to meet the needs of businessmen:

Accuracy, quality and currency – the information must be trustworthy and up to date.

Confidentiality – businessmen want the reassurance that their request for information will be kept in confidence.

Speed – businessmen have to stay abreast of developments in their external environment on an ongoing base. Decisions usually have to be made fast and if the information is not there when required it becomes irrelevant.

Re-packaging – information should be sifted. Answers to questions should be given or a solution to a problem should be given in a usable format that can be applied.

Confidence in service – businessmen should have trust in the quality of the service to know that the service has covered and reviewed all relevant sources of information.

Lessing (1999:17) distinguishes between 3 dimensions of information namely time, content and form which encompasses the qualities that turn mere data to value added information).:

Time dimension

Information should be provided when needed. It should be current and provided as often as is required. Information can be supplied about the past, present and future time periods.

Content dimension

Information should be accurate and free from errors. It should be relevant to the needs of the client and his specific situation. It should to be complete yet concise. The scope of the information can range from a broad to narrow scope or an internal or external focus. Information can also be gathered to measure performance.

Form dimension

Form refers to the format and style in which information is presented. The information should be presented in a form that is easy to comprehend. The information can be presented in detail or summary form. The order of the information can be arranged according to various criteria such as date or topic. The presentation and the media in which the data are presented can also vary.

Lessing's 3 dimensions encompass most of the requirements Pretorius gives for business information. The NBD SBD in the assessment of their information needs should consider all these factors. Appendix A offers a compilation of various questions that should be asked in such an assessment.

4.4 The input-output model and Duffy's basic KM model

A combination of Duffy's model and the input-output model will be used to design a practical approach for the NBD SBD in order to deal with its knowledge and information. Duffy focuses on the actual activities which make up the KM process, whilst the input-output model gives a generic process flow similar to that of a basic communication model. Duffy has an emphasis on people, which to him are the most important element in his model whereas the input-output model has a technical focus with a central database as the focal point.

Although a data warehouse forms the centre of the input-output model, it can also be used to monitor and explain the flow of information within the SBU. The way it explains and categorises the different inputs as generators of information are useful with the identification of information, which Duffy indicates as the first step in his list of KM activities. The rest of Duffy's KM activities can be found in the input-output model namely storage, access, distribution and application with the exception of the destruction of obsolete data.

The input-output model are used below as the structure on which to build a KM model for the NBD SBD, supplemented where necessary with bits of Duffy's basic KM model.

Although Chapter 2 lists the individual components of input-output model it is included for the purpose of this section below, upon which each component is elaborated in context of the SBU.

Components of the input-output model

The components of the input-output model are:

- 4.4.1   a warehouse,
- 4.4.2   the generators of information,
- 4.4.3   information workers (people),

4.4.4 and delivery channels.

4.4.1 Data warehouse

The IDC has a central records database where all the reports of investigation and project teams are stored. The question arises how IDC will record reports of SBU's within IDC's new structure. Reports could be adapted by the SBU to suit their specific needs. Where investigation teams before were made up of up to five members, it could in future just be one person who will assess the viability of an individual company. As indicated in the KM Map, the SBU will have to decide what it is going to submit to the central records database, this will also depend on the general policy of the IDC. Some of the SBU's have already indicated that they will build up their own departmental databases. They do not see the need to store all the documentation and reports of IDC centrally. In the case where they work on projects they will continue with existing reporting structures within departments. Regardless of IDC's policy the SBU will still have to decide about how they are going to bring all their information together in the SBU and how they will store and organise it.

4.4.2 Generators of information

All suppliers or sources of information are included here. A distinction is usually made between external and internal sources of information. Internal sources would include all information generated internally either through the transactions or activities of the companies. External sources encompass information generated outside the company. To identify what information within each generator to follow is

probably the most difficult assignment of all. With the wealth of information available it is important to be selective and to know what to look for.

Databases maintained and developed by vendors of specifics types of information

McGregor BFA, for financial analysis of the JSE (Johannesburg Stock Exchange) listed companies and sectors. Here it is possible to perform various ratio analysis on the sector of which the SBU has identified the following as important:

Financial ratios: debt/equity

goodwill/cost of control

current ratio

price/earnings average

share price/ net asset value, and

the nature of business of each company in the sector to get a feel for the structure of the industry. Profiles can be set upon this database whereby the user can obtain real time or daily share prices and news items. This type of information requires of the end user to have a basic understanding of the methodology of financial analysis. It does not include the insight that would come with interpreted analysis of industry experts. It is up to the user to decide what he requires from the database and then extract the necessary information.

Profound for market research

This is a comprehensive full text database covering any published market research on all existing industries. Alerts can set up on any topic and e-mailed to the user as frequently as required. More recently Profound has developed the system so that databases can be selected and integrated with the intranet according to the marketing profile of the company. Unfortunately Profound lacks good quality market research on South Africa either because no research has been done or the market research companies does not see it as profitable enough to publish their reports on it. An example would be BMI Techknowledge whose reports do not feature on Profound.

Stockpress

This is a media monitoring service which covers all the sectors of the JSE, and gives information according to company and industry sectors. This can be subscribed to on a daily, weekly of monthly basis depending on the requirements of an individual company. In this way an individual can stay abreast of developments in his sector based on the time frame he requires. Although Stockpress does not publish industry surveys it informs the user of when and where they appear, so that these can then obtained from the library afterwards. It also makes a selection from similar articles and chooses the more comprehensive one, so that the reader is burdened with less reading.

Industry journals

More technically oriented industry journals in South Africa include:
- Computer Week
- Computer World
- Computing SA
- Datamation
- Dataweek
- Network World SA
- PC Magazine Southern Africa
- PC World and
- SA Lan Times.

In a meeting with BMI TechKnowledge (BMI Tech) they did not regard the above journals as sufficient to stay abreast of strategic market developments in the IT industry. The above journals are inclined to be very technical in nature with occasional snippets of market news. They were of the opinion that general publications such as Financial Mail, Finance Week, Business Day and Engineering News offer more insight of trends and strategic developments in IT markets. These publications often feature IT surveys, which discuss new industry developments and gives overviews of market trends.

Management information

BMI Tech has been bringing out detailed market research on all the subsectors of the IT industry including telecommunications, software, networking, banking, personal computers, emerging media (Internet), channels and communications for a number of years. This research is highly value added. It is compiled by industry experts who has worked with on the industry for a number of years. They define and analyse all the significant IT markets in SA. Although it will be difficult for the NBD SBD to know what sector of the IT industry will generate the most business, past experience has shown that it could be vary from telecommunications to software development. Since the NBD SBD will not get involved in the physical running of the business they would mostly want to know about the market prospects for the industry sector in which the prospective client operate. For this type of insight the SA IT Market Overview would probably suffice. BMI Tech includes a segmentation of the IT sector, covers local and overseas IT markets with a five year forecast in this report. It has strong ties with its mother company International Data Corporation who keeps track of international IT markets. This gives BMI Tech access to a wealth of information, which they incorporate and correlate to trends in the local market. They are the only company who brings out regular surveys of the IT sector which includes, IT expenditure by the listed companies (which makes up more than 60% of all IT expenditure in SA) and pc and software sales by the major vendors.

The NBD SBD is fortunate to have this type of market research available, and there are various options available to them when and if they need specialised market research or expert opinions. BMI Tech is flexible in terms of various subscription packages whereby the NBD SBD can buy research time from them. Once the SBU have familiarised themselves with the content of BMI Tech, they can scan and read the media with a more informed and focused perspective and be able to follow trends identified by BMI. Important here is that they should be able to relate these developments back to individual clients and utilise the information and knowledge gained, to make informed decisions. Ultimately the aim of the SBU should be to move up the knowledge map to the innovation phase and come up with new ways of financing and assisting clients.

4.4.3 Information workers

The key characteristics of information workers are given in chapter two below section 2.3.3 and include qualities like that the people should be learning people. The information officers at the IDC certainly meet these requirements and should be able to assist the NBD SBU members with the gathering of required information. One person in the SBU should however also be made responsible to control and oversee the two databases and external sources of information.

4.4.4 Delivery channels

Information can be delivered through various channels of which e-mail, the internet, intranets are examples. In the IDC the NBD SBU have all these facilities available to make the delivery of information easy and seamless. What they should investigate however is how they can utilise all these channels to their full advantage. In this investigation they should look at how they are going to present themselves to clients and how they want to the clients to make contact with them.

4.5   CI strategy

Where the CI strategy comes in to play for this SBU is specifically on the financing side (how the companies finance their business). BMI can unfortunately not provide much insight into this aspect of the IT business. They admit that they do not endeavour into concepts like intellectual capital which is fundamental to understanding the financial structure of the IT industry. This is probably the area that the SBU will need to undertake their own enquiries in and establish what sort of packages and deals the various venture capital funds and schemes offer and if there are gaps which they can fill. The NBD SBD sees their competitive advantage in the following:

- They have funds available to invest.
- Being part of the IDC still gives the SBU, although to a much lesser extent, a developmental role. As such it has a more flexible approach than what a bank would have. They could for instance develop a tailor made finance scheme like the Tourism SBU did once they have established the needs of the industry.

- They are experienced in due diligence studies and have been exposed extensively to market and financial analysis of companies.
- The IDC is administering the Support for Industrial Innovation Program that will provide a flow over of potential clients to the SBU.
- The SBU does not necessarily see itself as competition to existing players in the field, but would rather like to investigate and identify areas in which they could co-operate with existing players.

The SBU should be able to learn from industry contacts and applications for finance what type of financial products are needed in the IT industry. They should identify possible gaps that they would be able to fill. The success of the SBU would depend on how it leverages its strong points as listed above.

4.6   Conclusion

The NBD SBU has both the experience and resources available to manage their knowledge and information effectively. With the KM map and input-output model the SBU can ensure that it has a co-ordinated approach to its KM programme. The KM map helps to give direction of where the SBU wants the KM programme to go and plots where it finds itself currently on the KM map. For the SBU the most important applications of knowledge and information are potential clients for finance and future projects. A framework is required to organise and interpret loose bits of information and in general to know what too monitor in the industry. BMI Techknowledge gives an overview that would provide a background to form an understanding of the industry but more important a framework of how industry subsectors hang together. When a specific application for finance is received it should be possible to place this company in the framework of the overview and from there conduct a specific subsector analysis. From that point all the industry resources (generators of information) that are listed in the input-output model can be utilised for an analysis of a subsector. Too the SBU the highest level of transform or innovate in the KM process would be limited to the design of new financial products for its clients.

The input-out model is used as a practical example to the SBU of how information flows in and out of databases, and how it should bring all the sources of information

together as input. The more important industry sources are listed as the generators of information that the SBU should monitor on an ongoing basis. The tools and information sources are already available to the SBU that should enable it too utilise the information effectively. The only shortcoming at this stage is that the SBU has not determined its focus yet, and still needs to assess where it sees itself in the market.

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