

Chapter 1

Introduction

To practice a discipline is to be a lifelong learner. You never 'arrive'; you spend your life mastering disciplines. You can never say 'We are a learning organization,' any more than you can say 'I am an enlightened person'. The more you learn the more acutely you become aware of your ignorance (Senge, 1990, p 11).

1.1 Background

The knowledge economy differs significantly from any of the previous economies familiar to the seasoned worker of today. The challenge is for these workers to adapt and make use of the opportunities brought about by the new work environment. On the other hand it is an important requisite for the current work environment that the integral link between the skills, capabilities and talents of workers as individuals (but also as contributors to the outputs of a fluid group of co-workers) and the success of the enterprise be recognized. For the managers of an enterprise, the challenge lies in identifying the tools and mechanisms that will both support the creation of skills and stretch the capabilities and talents of the employee. This is in the belief that the knowledge era employee is the building block that will ensure the long term sustainability of the enterprise. A statement that resulted from the *Tactics for Becoming a Successful Knowledge Business Conference* that was held in June 2002 in Johannesburg, support this opinion. *To be competitive in today's technologically dependent business world, more and more successful enterprises are recognizing that the only differentiation in the long term is their people and the knowledge they hold. Knowledge of customers and their preferences; knowledge about markets and competitors; knowledge about procedures and problem-solving methods; and knowledge about how to win* (du Toit, 2002, p 22).

This *technology dependent business world*, that du Toit refers to, spells a change in productivity. Duffy (in Wiig, et al., 1997, p 23) provides a reminder that the tools driving productivity in the new knowledge economy are computers, advanced telecommunications, robotics, biotechnology, materials sciences, laser technology, and energy technology. In this regard it is said that *History will pity the managers of the 1990s. The Internet touched down in their midst like a tornado, tearing up the old game book, disrupting every aspect of business, and compelling them to manage for a new economy* (Brown and Duguid, 2000, 74). However, it must be remembered that the new technologies enable farmers to produce more food with fewer people, manufacturers to produce better goods with fewer work hours and less materials and energy, and a variety of service providers to provide more and better service with fewer people and less energy. Similarly, librarians and information workers who are able to adapt and take advantage of the opportunities and the enabling technologies of the knowledge economy not only contribute to the success of their clients but are also successful in their own right.

Many authors have speculated about the work and the workplace that could be associated with the knowledge economy. For example, the work of Apgar (1998, pp 121-127), Duffy (in Wiig, et al., 1997, p 26), Julies (1998, p 15), Malone and Laubacher (1998, pp 146-152) and Wallace (2000, p 10) predict that:

- a large section of the modern workforce will work from home;
- there will be a continued move away from large corporate to small and medium enterprises;
- employees will be increasingly responsible for their own careers and will not necessarily remain loyal to one company;

- it will become very difficult to find and retain desired employment. Therefore employees will need to learn to be more tough-minded and independent;
- a company will need to invest in its employees if it is to retain a talented and highly motivated workforce;
- organizational structures will need to be flatter, more flexible and less defined than ever before;
- trusting in unconditional, lifetime employment will be outdated;
- global competition will force a constant search for means of improving productivity at the cost of job security;
- the relationship with customers and suppliers will change dramatically;
- the majority of jobs will be information-related; and
- virtual work environments will increase.

Wallace (2000, p 5) also drew a comparison between the traditional workplace (physical presence of the worker, attachment to time and space, and a place to go to) with that of the future place of work (not bounded by visual and physical proximity, mobility of staff, and virtual products delivered by virtual teams). The predictions listed above, combined with Wallace's comparison call for a critical review of the current work environment. They indicate a number of new opportunities and challenges waiting to be discovered.

The objective of this study was to recognize these predictions; to investigate what the impact of the knowledge economy is expected to be; and to identify the most appropriate knowledge economy management philosophy within the given context. This knowledge is then applied within an information support services environment. Finally, the impact of the implemented actions is measured, conclusions are drawn and recommendations are made based on the experience gained. The context within which the study took place is set out below.

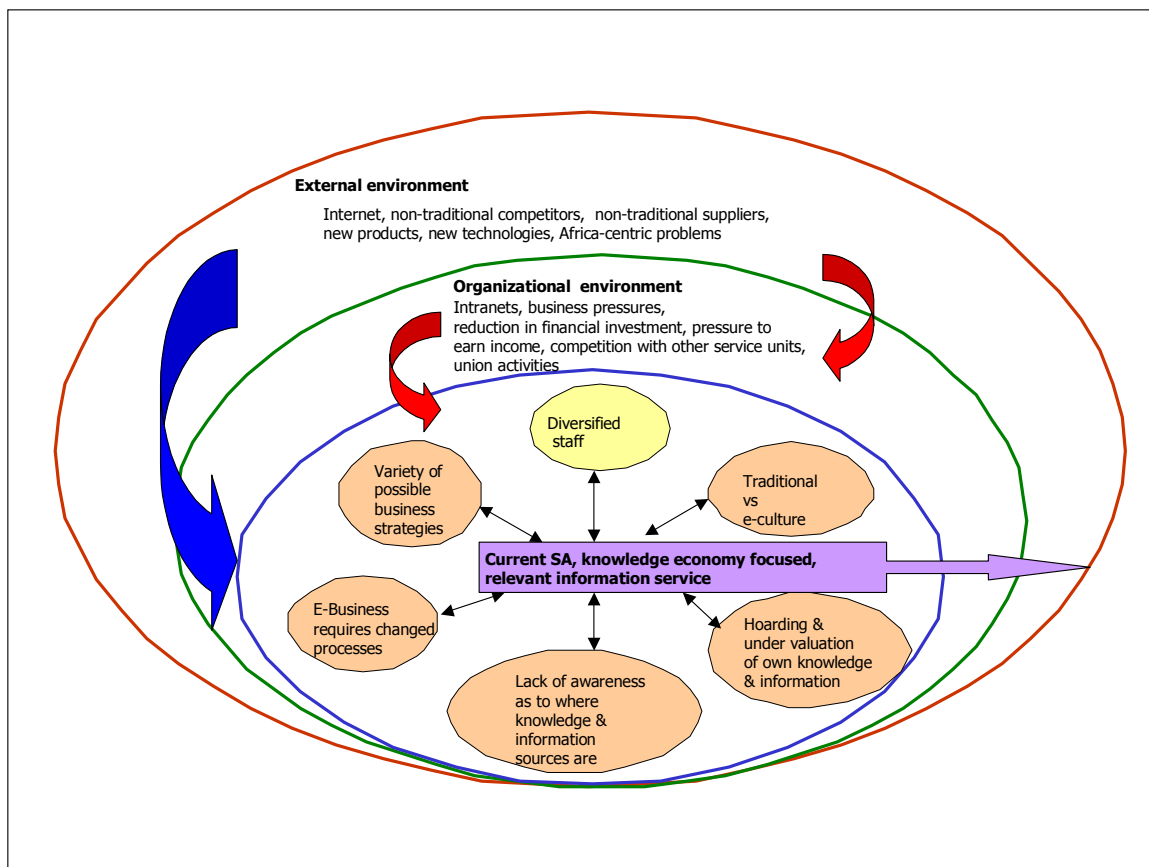
1.2 Context

Firstly, this research was carried out specifically within the South African context. This has special relevance due to a perception that, in the process of building organizational structural capital, the relationship between suppliers and organizations functioning within certain geographic regions will in future play a significant role. Secondly, the study was carried out within the context of a large research organization that is striving to remain one of South Africa's leading examples of an efficient learning organization. This has relevance because the knowledge economy requires that an enterprise is confident of its own focus, which impacts on the role and position of a library and information service (L&IS) within that organization. Thirdly, the study was carried out within the context of the wider L&IS profession. This study has specific relevance to the special L&IS sector. This is of importance because the focus and drive within special libraries differ from that of academic and public libraries. Lastly, this study was carried out within the context of a converged L&IS where both front and back line activities take place. It is also a service where both internal and external customers are served. This study is relevant only to back-line activities and focuses on services maintained specifically for internal customers. The specific research problem that was addressed is discussed in section 1.3.

1.3 Research problem

Knowledge economy management literature is prolific but very little of the retrieved literature relates to the application of these management philosophies within the L&IS industry. If it is not reported in the literature, it is questionable whether current L&IS management strategies have kept pace with the developments required by the knowledge economy. Figure 1.1 is based on the model created by Davenport and Prusak (1997, p 34), which is discussed in more detail on [page 2.25](#). The figure depicts some of the pressures that impact on current library and information services.

Fig 1.1: The current library and information services environment (based on the Davenport and Prusak (1997, p 34) ecology model)



From the figure it can be seen that internal pressures arise from:

- a diversified staff complement with varying skill and competency levels;
- the need to move from the traditional L&IS to one which is in line with the knowledge economy's e-culture;
- a tendency to hoard knowledge as well as to under-evaluate the skills of information staff;
- lack of awareness as to where the expert knowledge within the profession and the service itself can be found; and

- recognizing the need to change business processes to be in line with an e-business approach but not being able to select the best processes from the wide selection of business approaches available to choose from.

External pressures relate to financial constraints as well as to new products, technologies, competitors, and suppliers. Additional pressure stems from being part of Africa and the need for a company to juggle 'what-is-good-for-Africa' with 'what-is-good-for-business'. The information professional has to adhere to the requirements for running a successful business and take the needs of both clients and staff into consideration in an environment in which there is no clear indication as to which management philosophy will be the most successful. There is a firm belief that the leader's personal style and preferences play a role in the choice he or she makes in terms of the philosophy to follow. The interaction between the information service manager and staff members is not one directional. The style of management impacts on staff but the actions of staff members also have an effect on management. Apart from the direct impact of having to manage the pressure stemming from the environment, the leader also needs to be aware of the impact environmental pressures may have on each other or the service may be caught unawares.

Having established the characteristics of the environment typical of a L&IS, the following question was formulated: *Keeping sustainability as well as the knowledge economy in mind, what is the appropriate management philosophy to follow when required to manage a library and information services support group?* From this question a research problem was defined.

The perception is that knowledge economy management philosophies are only truly applicable when managing knowledge workers. The perception is challenged because the advantages of these philosophies are such that they should also be deemed applicable within a back office environment – and more specifically within a L&IS back office environment.

This research is intended to be an exercise to test the applicability of intellectual capital management within the context of a large special L&IS. The research problem was subdivided into the guiding questions listed in Table 1.1. The table also provides an indication as to which chapters were utilized to address each of these questions.

Table 1.1: Guiding questions

	Question	Chapter
1	What does the knowledge economy involve?	2
2	Which knowledge economy management philosophies are being practiced?	
3	Of the available philosophies – which is the most appropriate to use within a library and information support services environment?	
4	What are the principles of the most appropriate knowledge economy management philosophy?	3
5	What generic tools and techniques have been identified and are available to stimulate growth in the skills, competencies, capabilities and job satisfaction of the workforce?	
6	Which of those tools and techniques are appropriate within the information support services environment?	
7	What are appropriate mechanisms for measuring and reporting on the impact of introducing a knowledge economy management style?	4
8	Which of those measures are of use and interest within the context of library and information services?	
9	What are the strategy and realities of implementing and maintaining a knowledge era management philosophy?	5
10	What is the impact of having introduced a knowledge economy management philosophy?	6

It was seen as appropriate to attempt to answer the first eight of the listed questions by consulting the available literature. The result of the literature review is captured in Chapters 2, 3 and 4 of this document. With the literature as background, actions were taken to implement and test the applicability of some of the methodologies identified. Research stretched over a period of 18 months. The implementation exercise is discussed at length in Chapter 5. Chapter 6 reflects the results of a variety of data collection methodologies. These methodologies were utilized to collect feedback and to measure growth in intellectual capital assets. More detail on the specific content of each chapter is provided in section 1.7. The section below provides insight into the status of research at the start of this project.

1.4 The status of research

Internationally, intellectual capital management research falls mainly in the commercial and management science sectors. It was not possible to trace evidence of research carried out in a similar L&IS context internationally. South African research as a rule also stems from the business and commercial academic departments (Hines, 2000; Kaes, 1999; Ramosedi, 2000; Robson, 2000; Zickner, 1996). Although relevant, most of this research is theoretical and none was conducted within the L&IS fields.

1.4.1 Existing theory

From the literature, it was possible to identify three relevant management philosophies: learning organizations, knowledge management and intellectual capital management. There is considerable overlap, in the scope of these philosophies. In brief, the focus of the learning organizations' philosophy is on the human activities associated with the creation, sharing, development and deployment of knowledge for competitive advantage. Knowledge management has tactical and operational perspectives. It is more detailed and focuses on facilitating and managing knowledge-related activities such as the creation, capturing, transformation and use of knowledge assets. Its function is to plan, implement, operate and monitor all the knowledge-related activities and programmes required for effective business operation management.

Intellectual capital management, in turn, is focused on building and governing intellectual assets from strategic and company governance perspectives with some focus on tactics. The main purpose of intellectual capital management is to take overall care of all the company's intellectual assets. All three of these theories are seen as fundamental building blocks, even cornerstones, in an effective management model for the 21st century.

1.4.2 Motivation for further research on the problem area

Within this research, it was the contention that none of the knowledge economy management philosophies should be pursued in total isolation. It was seen as appropriate to select a driving philosophy (intellectual capital management) but to, where necessary, interweave it with aspects of the other management philosophies (knowledge management and learning organizations) to achieve a sound, balanced view of modern management practice. As no proof was found that intellectual capital management had been applied within the South African 'special' L&IS context and as it is the philosophy being pursued by the Council for Scientific and Industrial Research (CSIR), it was seen as valid to test if it were possible to successfully apply the same principles within an environment not typically associated with knowledge workers.

1.5 Research design

As one of the initiatives to improve internal structures, it was decided during 2001 to appoint a senior CSIR director to drive an initiative to strategically align the CSIR's information services. Ten divisional services were consolidated into a single entity to form CSIRIS (CSIR Information Services). The change brought about many opportunities. This study is but one of these. As one of the relatively inexperienced managers who were appointed to manage CSIRIS, the researcher was expected to, with sufficient mentoring, acquire the necessary skills to grow and build the service to its rightful position within the CSIR's structure. Undertaking this study was seen as an appropriate method to ensure that both the researcher and the reporting staff would acquire knowledge and skills that would enhance the move to a knowledge era relevant information service.

Given the context, case study research was seen as an appropriate method to use. It was established that this type of research would be mainly qualitative (or more specifically interpretative qualitative) in nature. Schurink (in De Vos, 98, p 243) and Mouton (2001, pp 161-162) describe qualitative research as research where the researcher is concerned with:

- understanding rather than explanation;
- naturalistic observation rather than controlled measurement;
- focusing on implementation rather than on (quantifiable) outcomes;
- the subjective exploration of an insider opposed to an outsider perspective; and
- fostering improvement and self determination.

In the process of designing the research, the four-dimensional framework suggested by Mouton (2001, pp 144-145) was used. Within this framework, it was possible to categorize the study as follows:

- empirical research;
- using predominantly primary data;
- where data is predominantly textual; and with
- relatively low control.

This classification was confirmed by Mouton's (2001, p 149) analysis of typical case study research.

A literature study, completed partially by the researcher prior to the start of the case study work, provided insight into the background against which the case study needed to be conducted. In order to provide that background, it was necessary to find answers to the exploratory questions listed in Table 1.1.

The work of Ertmer (in Leedy, 1997, pp 157-158), Fouche and De Vos (in De Vos, 1998, pp 124-125) and Powell (1997, p 49) provided general information on the use of case study research. The research presented in this thesis was designed according to Fouche and De Vos's classification as a 'one shot' case study. 'One shot' case studies require adequate knowledge of the history of the unit so that the researcher can monitor and record changes that take place over a period of time. The intention is to find variables that may be associated with these changes. The researcher spent most of the research period on site with the research participants, which Ertmer saw as a prerequisite for case study research. Because the applicability of a management philosophy within the given context was evaluated, the case study could also be classified as an evaluative case study as described by Ertmer.

All authors consulted (Ertmer (in Leedy, 1997, pp 157-158); Fouche and De Vos (in De Vos, 1998, pp 124-125) and Powell (1997, p 49)) indicated that it is suitable to use a variety of data collection methods when carrying out case study research. Powell specifically provided insight into the data collection methods used within the

L&IS context. The data collection methods, identified for use within the context of this research, are the following: observation; focus group discussions; semi-structured interviews with individuals as well as within group context; a Delphi exercise; content analysis and a skills audit. Each of these is described in more detail below.

- **Observation.** *In essence observation relies on watching, listening, asking questions, and collecting things* (Powell, 1997, p 148). The researcher usually has a choice in terms of the degree of participation when he performs the role of observer. Within the context of this study, the researcher was, due to the designated position, also a participant. According to Powell, a participant position is advantageous because it allows the researcher to understand what is occurring without needing to deliberately introduce new stimuli. This technique was especially useful in terms of evaluating the personal growth shown by certain individuals within the case study group but also to observe the development within the group as a whole.
- **Focus group discussions.** Within the context of information services, focus groups are popular when testing client perceptions (Crowley, et al., 2002, p 206). The technique is, however, also appropriate for testing staff satisfaction. When testing staff opinion, it is recommended by the authors consulted (Chase and Alvarez, 2000, p 359; Monolescu and Schifter, 2000, p 172 and Zemke and Kramlinger, 1982, p 88) that no managers or staff members regarded as managers (within the given context they would, for example, be union representatives) are included in focus group discussions. Ideally, because focus group discussions make provision for diverse opinions, it is advisable that group members not know each other very well. Within the context of this research that was not possible. However, because staff satisfaction is largely determined by the interaction amongst colleagues, this was not seen as detrimental to the process. Chase and Alvarez (2000, p 361) reported a very similar situation in their research and did not identify any negative effects due to the focus group members knowing each other. Another deviation from the classical focus group technique is that communication technology was used to verify the data collected. Instead of making recordings of the discussion, only the main ideas, concerns and recommendations were recorded and these were then verified by allowing participants editing access (via a document management system) to the discussion record. Parent et al., (2000, p 56) warned that using technology in such a way might cause less satisfaction in the participants than they experience with the classical focus group methodology. Neither the facilitators nor the researcher observed any dissatisfaction because of the implemented adaptation. The researcher's role in the focus group exercise was to prepare guiding questions, to brief and provide training to facilitators and to analyse the results of the discussions.
- **Semi-structured interviews.** Semi-structured interviews were conducted at both an individual and group level. Research done by Kaplowitz and Hoehn (2001, p 245) indicated that interviews are complementary to focus group discussions. The researcher used the technique to gain feedback on both staff satisfaction and stakeholder perceptions. The advice provided by

Westbrook (in Powell, 1997, pp 150-151) and Zemke and Kramlinger (1982, pp 101-103) for preparation and conducting semi-structured interviews was followed. Although an outline was prepared for each of the interviews, participants were requested to treat the interviews as feedback conversations. This generally allowed participants to move backwards and forwards in time and it also allowed the researcher to adapt both the sequence and the number of questions asked. Where appropriate, additional clarifying questions were added to the interview, as was suggested by the literature consulted.

- **Delphi exercise.** According to Powell (1997, p 49), the Delphi technique is a procedure that uses a number of sequential questionnaires. The technique dates back to the early 1940s. The purpose is to gain feedback from a variety of people and to then converge that feedback so that the joint effort can lend direction where there is no absolutely correct answer (Zemke and Kramlinger, 1982, pp 149-150). The Delphi technique therefore requires that opinions on a specific subject are compiled and shared amongst a group of experts for a set number of rounds until the group reaches consensus on the opinions expressed. The researcher can, during the initial round, either compile a questionnaire or request input from the target population. Within this research, the process was started with a very short prepared questionnaire. Traditionally respondents do not communicate directly with each other. The postal service is used as the delivery mechanism for communication between the researcher and the respondents. To make successful use of the Delphi technique, a researcher therefore needs to allow for an extended research period. Fortunately modern technology allows for deviations from the traditionally extended period necessary for the research. Within this research, the researcher made use of corporate e-mail and document management systems to collect and record feedback from clients (seen here as the informed individuals required to do the exercise). In terms of the number of iterations, the advice provided by Keeney, Hasson and McKenna (2001, p 198) was followed and the exercise was therefore restricted to three rounds.
- **Content analysis.** Essentially, content analysis involves a systematic evaluation of words, phrases and concepts (Powell, 1997, p 50). Mouton (2001, p 166) sees typical applications for this technique when propaganda, speeches, editorial statements, letters and annual reports are analysed. The researcher used the technique to analyse a staff newsletter, minutes of meetings and client feedback forms.
- **Skills audit.** The works of Lombard, et al., (1999), Marshall, et al., (1996) and van Deventer, Mbundu and de Bruyn (1999) were used to establish the skills required within a modern L&IS. A skills audit was carried out to establish a list of the available skills within the research group. This resulted in the creation of a skills development plan for the section.

Data was collected during as well as at the end of the research period. Data analysis took place during the research period but all analysis culminated in the preparation of an intellectual capital report, which was completed towards the end of the research period. The findings in the report were shared with stakeholders who in turn assisted in identifying priority actions for the next phase in the development of the case study group. No detail on the 'next phase' was included in this research.

1.6 Clarification of terms, concepts, acronyms and abbreviations

A number of terms, concepts, acronyms and abbreviations are used in this thesis. These are repeated here, in alphabetical order, for the sake of convenience.

- CoP Community of practice. The plural 'CoPs' is also used. A community of practice is a knowledge-sharing group in or between organizations. A community consists of a group of people who are bound together informally by their shared expertise and passion for a joint enterprise. Community members understand that by sharing their experiences, insights and understanding within the group, they develop new approaches and a better understanding of how tasks could be done (De Bruijn, 2001, p 2; Wenger and Snyder, 2000, p 139).
- CSIR The **C**ouncil for **S**cientific and **I**ndustrial **R**esearch was established by Parliament in 1945 as the central scientific research and development resource for South Africa. The CSIR remains South Africa's top technology and innovation agency. Today the CSIR is the largest research and development (R&D) organization in Africa, accounting for about 10 % of the entire African R&D budget. A staff complement of approximately 3 000 includes some of the top technical and scientific minds in the country, collaborating in multi-disciplinary teams, to put forward solutions of the highest standard in innovation and excellence.
- CSIRIS This acronym refers to the CSIR's Information Services programme. The unit resulted from the consolidation of 10 library and information services. The services were previously attached to the various strategic units within the CSIR.
- DMS Within the CSIR, this refers to a central **d**ocument **m**anagement **s**ystem, which is also linked to the e-mail system. It is a central repository for all significant documents and allows for both version and access control.
- EbscoHost The EbscoHost web site (<http://ejournals.ebsco.com/login.asp>) claims that the *EBSCOhost Electronic Journals Service (EJS) is a gateway to thousands of e-journals containing millions of articles from hundreds of different publishers, all at one web site.*
- GAAP **G**enerally **a**ccepted **a**ccounting **p**ractices.
- GAELIC The **G**auteng and **E**nviron's **L**ibrary and **I**nformation **C**onsortium. It is the largest L&IS consortium in South Africa and currently mainly caters for the needs of a select set of academic libraries.
- ICT Information and communications technology.

ILLs	Inter-library loans.
IMPS	The acronym used to refer to the information support section within CSIRIS. The section takes care of information management internally and the procurement of external information.
Information vs. Knowledge	<p>Sveiby (1998b) provides a detailed description of information and the meaning of information within the knowledge economy. With that as background it is possible to come to the conclusion that if the difference between knowledge and information is not understood, it is very difficult to grasp the reason why knowledge and more specifically the management of knowledge is valued to the extent that it should be. Robson (2000, p 10) used a mailing list to illustrate the difference. Suffice to say that once the data on a number of people is structured into a database or list, it becomes information that can be used repeatedly. Once intellect is applied to create subsets or to merge one list with another in order to apply that information, the realm of knowledge is entered.</p> <p>It is said that knowledge is the modern worker's most important asset. It is therefore assumed that knowledge-based assets will be the foundation of success in the 21st century.</p>
IT	Information technology.
Knowledge workers	In this study, knowledge workers refer to those members of staff who create knowledge through research and who consume knowledge through access to literature and regular contact with experts.
KRA	A key result area is an identified action/activity that forms part of the basis of the six monthly performance review discussions between managers and staff members within the CSIR.
L&IS	Library and information service.
M&BD	Marketing and business development.
Millennium	Strictly, Millennium is only the web interface portion of the L&IS system used to manage the CSIR's library collection but it has become a collective term to indicate the complete system. Millennium is used by academic institutions within GAELIC and is sometimes also referred to as III Millennium or Innopac. A single system is in use between CSIRIS and the University of Pretoria Academic Information Service. As a result, the institutions have a shared catalogue.
OCLC or OCLC/Pica	It was established from the OCLC web site (http://www.oclc.com) that OCLC is a non-profit membership organization serving 41 000

libraries in 82 countries and territories around the world. Founded in 1967 by United States university presidents to share L&IS resources and reduce L&IS costs, OCLC introduced an online-shared cataloguing system for libraries in 1971 that today is used by libraries around the world. The inter-library loan service was introduced in 1979 and since then has been used for more than 120 million loans among 6 928 libraries around the world. Pica is an equivalent European system and was recently acquired by OCLC.

R&D	Research and development.
SADC	Southern African Development Community. A collective term used when referring to countries geographically situated in the southern half of Africa.
Sabinet Online	<p>Sabinet Online has 18 years' experience in the online information industry and established itself as a database publisher and provider of services on the web. Sabinet Online on their web site (http://www.sabinet.co.za/company.html) claims to:</p> <ul style="list-style-type: none">• further resource sharing between libraries and information centres;• promote the location of information sources;• raise the cost-effectiveness of the acquisition and cataloguing processes in libraries;• support bibliographic control in South Africa; and• allow the flow of information within and between L&IS consortia.
ScienceDirect	The ScienceDirect web site (http://www.sciencedirect.com/) claims the following about the product: <i>Born out of an Elsevier Science® tradition in scholarly communication, ScienceDirect® has always followed a vision of the digital library of the future. Today they offer one of the world's most advanced web delivery systems for scientific, technical and medical information.</i>
SU	Strategic Unit is an acronym used within the CSIR to demarcate a unit or division responsible for a specific area of research. Eight SUs currently perform research in the following areas: mining, transport, information technology, buildings, environment, defence, biochemistry and manufacturing.
Tacit vs. Explicit	According to Roos and Roos (1997, p 415), the distinction between tacit and explicit knowledge refers to the interplay between what is in the mind (tacit) and what is captured outside the mind (explicit). Although tacit knowledge is recognized as the most valuable for an individual, it is only of real value to a company when it is converted to explicit knowledge. Top performers are said to be individuals with

highly productive tacit knowledge stores.

When a group or team share, use and rely on its tacit knowledge, it is usually able to boost its performance relative to other teams in the organization or elsewhere. High-performance teams therefore resist the embodiment and distribution of their knowledge.

Brown and Duguid (2000, p 76) state: *At both the individual and team level, tacit knowledge is un-embodied. It is held in memory or in the day-to-day business practices of a small number of people. Actual work practices are full of tacit improvisations that the employees who carry them out would have trouble articulating.* Turning tacit knowledge into explicit knowledge is part of the continuous cycle of learning, sharing, reflection and use of that knowledge. However, Jordan and Jones (1997, p 397) warned that too much formalization of the 'best way' could actually lead to less creativity and innovation. They are also of the opinion that when knowledge is primarily explicit in nature and routines are deeply embedded, it is difficult for individuals to think laterally ('outside the box'). In contrast, informal communication and opportunistic learning promote spontaneity that is a key element of creativity and serendipitous learning. The challenge is to balance the tension between the efficient exploitation of existing explicit knowledge and the exploration for more innovative solutions.

Tangible
vs.
Intangible

To understand the true value of knowledge management science authors started to divide organizational assets into tangible (visible or physical) assets and intangible (invisible and difficult to quantify) assets. Sveiby (2000a, pp 1-2) is of the opinion that all tangible physical products, assets as well as the intangible relations, come about because of human action and depends ultimately on people for their continued existence. As a result humans constantly extend themselves into their world by tangible means, such as papers, documents, craft, houses, gardens and cars, and through intangible associations with corporations, ideas, and other people. Sveiby's opinion is supported by the researcher. It is useful to remember that in contrast to tangible goods, which tend to depreciate when they are used, the intangible grows when used and depreciates when not used.

UP AIS

An acronym used for the **U**niversity of **P**retoria **A**cademic **I**nformation **S**ervice.

The next section provides more detail on the structure of this report.

1.7 Chapter distribution

This report is subdivided into seven chapters. Besides Chapter 1, the report is structured into the following chapters:

Chapter 2 The chapter gives insight into the information gathered through a review of literature about the knowledge economy. A number of available knowledge economy management philosophies were identified and investigated for appropriateness within the context of this research.

The management philosophies that were investigated are the following:

- learning organizations;
- knowledge management;
- intellectual capital management;

Chapter 3 The focus of this chapter is on the development of the following three components of intellectual capital:

- human capital;
- structural capital; and
- customer capital.

Most of this chapter was utilized to report on the investigation into:

- actions that need to be taken to develop human capital;
- methods to build structural capital; and
- principles of engaging in customer capital development.

The knowledge gained from the investigation was implemented within the case study environment, which is reported on in Chapter 5.

Chapter 4 Measuring the impact of intellectual capital management is difficult – especially when there is very little tangible proof of a service's value. The purpose of this chapter is therefore to determine if appropriate measuring tools are available that could be utilized within the context of this research.

Chapter 5 The chapter provides a detailed overview of the activities implemented at the CSIR Information Services' IMPS section where an experiment was conducted to assess whether intellectual capital management was an appropriate management philosophy to follow. The activities were structured over a period of 18 months and were implemented in two phases. Kaplan and Norton's (2001a, p 100) adapted scorecard framework was utilized to set objectives for each of the two phases.

A situation analysis was carried out at the start of the experiment and an adapted version of Sveiby's Affärsvärlden model (2000b) was utilized

to identify specific actions and initiatives to be taken as a consequence of the situation analysis findings.

The last section within this chapter identifies the indicators that need to be evaluated for growth as well as the tools utilized to establish how much growth has taken place.

Chapter 6 This chapter provides a report on the results achieved during and after the 18-month study period. Results were collected using a wide variety of methods. This culminated in the creation of an intellectual capital report.

Chapter 7 This last chapter is utilized to report and reflect on the results achieved and the lessons learnt in the process of implementing intellectual capital management, to make recommendations for CSIRIS, to provide recommendations for further study and to make a number of concluding remarks.

1.8 Summary

Chapter 1 provides an overview of the background and context of the research. It also provides a problem statement, the methodology used, motivation for further research and an overview of the chapters. The first of the literature overview chapters, where specific attention is paid to the knowledge economy, follows.