PART I: INTRODUCTION & FRAMEWORK

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTORY ORIENTATION TO THE STUDY

The twenty-first century is characterised by new opportunities and challenges posed by the development of the information and knowledge society. This is a society that is transformed by the use of information and communication technologies (ICT), and where these technologies are used by developed countries as a positive tool for development. This society is evolving at a hurtling pace but, unfortunately, this pace cannot be sustained in all communities and on all continents. In Africa, this pace still lacks this speed notwithstanding content-wide initiatives, such as NEPAD (New Partnership for Africa's Development) and the ATU (African Telecommunication Union) (ITU, 2006b). Although these initiatives use the potential of ICT to accelerate growth and sustainable development in a vast majority of African countries, these countries are faced with numerous barriers such as a lack of financial and human capital, together with the policies and institutions (ITU, 2006b). These barriers also impede the interaction and exchange of information from their local knowledge systems with information from the global knowledge system, thus preventing them from harnessing the potential benefits of the information and knowledge society.

But what does a continent or community really need to become part of the true information and knowledge society? According to Britz *et al* (2006), there are four interrelated pillars to the information and knowledge society and these can be described as follows: usable content; human intellectual capability; information and communication technology and connectivity; and infrastructure and deliverability. These pillars form part of the specific criteria that are needed by the country or community to become information and

knowledge societies. For countries and communities to fully adhere to these criteria, the data, information, and knowledge from their local knowledge systems need to be shared and exchanged with data, information and knowledge from the global knowledge system. However, developing countries do not always have adequate access to the global body of knowledge to facilitate growth and development.

These four pillars, as well as the other criteria for becoming information and knowledge societies, are not always present in rural communities in most developing countries and communities, for example, South Africa and the Niger. These communities are in many cases not in a position to exploit information, in other words, they cannot create, locate, use, and distribute global information to transform it into usable content. In order to make use of existing global knowledge, local communities need sophisticated skills that enable them to analyse, translate, and synthesise global knowledge and then to blend it with local knowledge in order to create new forms of local content (IKWW, 2002). In Africa, the human and skills development picture still looks very bleak (Britz *et al*, 2006). Without proper education, this human intellectual capability is not available in rural communities.

The lack of financial and human intellectual capital is not the only barrier faced by rural communities in Africa and South Africa. Despite a mass of information available at a global level, most rural communities in South Africa cannot access information from the global knowledge system, as they do not have the technological means (Gillwald *et al*, 2005). This technological barrier, also described as the digital divide, deters developing communities from becoming part of the global information and knowledge society (Kling, 1996). ICT and connectivity is another one of the four needed pillars to become part of the true information and knowledge society (Britz *et al*, 2006).

However, this digital divide does not only have a technological dimension that becomes a barrier in rural communities. Lor (2003) identifies the following dimensions of the digital divide described in the literature on the basis of barriers and their effects:

- Connectivity;
- Capacity;
- Content;
- Community;
- Finance;
- Business environment;
- Legal/regulatory environment;
- Policy framework; and
- Moral/ethical framework.

These dimensions or barriers are present in rural communities and prevent communities from progressing towards becoming information and knowledge societies.

During the IST2002 conference on “Bridging the Divide” in Copenhagen, the SA Minister of Arts, Culture, Science & Technology, Dr. B.S. Ngubane, also specifically highlighted the technological and social barriers responsible for the lack of participation of developing communities in the global information and knowledge society. He commented that, “The question of course is, will these tools reach and will poor people effectively use them? In order words, which factors constitute the infamous digital divide, which is preventing the creation of a truly inclusive global information society? For Africa, the response is unequivocal: [it] is poor ICT infrastructures, combined with weak policy and regulatory frameworks and limited resources, as well as a lack of local-content software, which has resulted in inadequate access to and utilization of affordable telephones, broadcasting, computers and the internet.”

Based on the above scenario, the thesis will discuss how the interaction and exchange of data, information, and knowledge between developing countries’ local knowledge systems and the global knowledge system contribute to their development and positive participation in the global information and knowledge society.

1.2 PROBLEM STATEMENT AND OBJECTIVES OF THE STUDY

1.2.1 Problem statement

The research problem of this thesis centres on the question of what is meant by information and knowledge societies and, following from this, whether developing communities can become information and knowledge societies. It will be argued in this thesis that developing countries and communities can become information and knowledge societies through the interaction and exchange of information between their local knowledge systems and the global knowledge system. Based on this broad formulation, the problem statement can be formulated as follows:

"To critically analyse the notion of information and knowledge societies, and to explore to what extent the interaction and exchange of data, information, and knowledge between developing countries' local knowledge systems and the global knowledge system can contribute to their development and positive participation in the information and knowledge society."

1.2.2 Objectives of the study

In an attempt to give effect to the above-mentioned problem statement, a number of secondary aspects related to the topic should also receive attention. Accordingly, the author aims:

- to develop a better understanding of the concepts data, information, and knowledge, as well as the relationship between information and development;
- to determine what is meant by local knowledge and global knowledge;
- to develop an insight into the notion of an information and knowledge society;
- to determine the role that the interaction and exchange of data, information, and knowledge between countries' local knowledge

systems and the global knowledge system plays within developed countries;

- to determine the barriers that prohibit developing countries from becoming information and knowledge societies; and
- to determine possible solutions and recommendations that can be used to overcome the barriers that prohibit developing countries from becoming information and knowledge societies.

The goal of this thesis is to address the above-mentioned central problem statement as well as all the indicated sub-problems.

1.3 LIMITATIONS OF THIS STUDY

This study will lead to clarity regarding the following aspects: the role of information for development; the information and knowledge society; globalisation; local knowledge systems; the global knowledge system; and the interaction and exchange of data, information, and knowledge between these systems.

This study on the interaction and exchange of data, information, and knowledge between local knowledge systems and the global knowledge system, is limited in terms of the theoretical scope. This limitation is briefly summarised below:

- Knowledge Management: although knowledge systems, in terms of local knowledge systems and the global knowledge system, fall within the Department of Information Science's (University of Pretoria) research area of Knowledge Management, no attention will be given to any management aspects of the global knowledge system and local knowledge systems.

1.4 REASONS FOR THE STUDY

The thesis aims to provide insight into, and so help solve some of, the problems of the 21st century by helping to overcome the tension between global and local knowledge, as aptly described by Nanzhao (2001) in a report of the Sixth UNESCO-ACEID International Conference on Education entitled, "Information Technologies in Educational Innovation for Development: Interfacing Global and Indigenous Knowledge". According to Nanzhao (2001), "The tension between global and local knowledge is one of several tensions to be overcome in solving the problems of the 21st century." The research will result in describing how developing countries and communities can become information and knowledge societies, through the interaction and exchange of data, information, and knowledge between their local knowledge systems and the global knowledge system, and thus overcome the tensions between them by recognising that local and global knowledge is unique and different.

At the SAP SA's SAPILA conference banquet held in September 2002 at Sun City, the president of South Africa, Mr Thabo Mbeki, stated that, "[E]ntire communities need to be exposed to the benefits of ICT and positive attitudes created towards the cultivation of awareness and everyday access and use of technology so as to bring all our people into the information age." These words acknowledge the importance of SA being an active participant in the information and knowledge society.

1.5 RESEARCH METHODOLOGY

In order to gather the relevant information, the method of investigation conducted in this research will be a non-empirical qualitative research method, namely a literature review. Van Maanen (1979:520) describes qualitative research as follows: "It is at best an umbrella term covering an array of interpretative techniques which seek to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world." A comprehensive non-empirical literature survey (Mouton, 2001:86) has been

completed in preparation for the completion of this thesis, so as to ensure the complete demarcation and focus of the work. This literature survey will be extended and elaborated on, as “a comprehensive and well-integrated literature review is essential to any study” (Mouton, 2001:180). The author consulted, amongst other bibliographic databases, citation indexes, journal articles, textbooks, and, of course, the internet to complete this comprehensive literature review focussing on ICT for development, local (indigenous) knowledge systems, global knowledge systems, globalisation, and the information and knowledge society.

This review was conducted to contextualise the subject of the study in a theoretical framework, and provide an overview of scholarship through an analysis of trends and debates. The review of the literature is based upon inductive reasoning, as the author needed to come to a proper understanding of the domain of scholarship (Mouton, 2001:180). The comprehensive well-integrated literature review undertaken, provided the author with the necessary understanding of the issues and debates in the area of information for development, and the study field surrounding the information and knowledge society. As a literature review alone cannot produce new, empirical insights (Mouton, 2001), the author combined this research method with empirical data obtained from authoritative secondary sources, such as the World Bank and United Nations, to obtain the necessary information for the completion of this thesis.

Furthermore, to determine and evaluate some important statistical information, the author did use quantitative methods, for example, to determine the number of internet users in a particular country, to determine the personal computer penetration within a country, to determine the distribution of accessible roads within the country, etc.

The analysis mode of this research is mainly based upon a hermeneutical investigation where the literature is analysed within a particular social and cultural setting of people, in order to understand the meaning of the selected literature. However, aspects of “open coding” as an analysis method

concerned with the grounded theory research approach, is also evident in this thesis. The basic idea of the grounded theory approach is to read (and re-read) a textual database, and to "discover" or label variables, or categories, concepts, and properties, as well as their interrelationships. Open coding is the part of the analysis concerned with identifying, naming, categorising and describing phenomena found in the text. In this thesis, the author identified various criteria of the information and knowledge society, as well as the components that these criteria comprise of, together with the underlying relationships between the stated criteria and components.

A very important facet of qualitative research is to determine the reliability of the information and the researcher, as well as the validity of the research undertaken. According to Gorman and Clayton (2005), the data can be found to be reliable if the researcher's subjective role is outlined, the researcher has fully and carefully explained the data-gathering procedures used, kept thorough notes, and used multiple sources of data to verify the observations. The author has complied with all this criteria, and therefore the information in this thesis can be regarded as reliable. Validity refers to the extent to which something actually measures what it is intended to measure (Gorman & Clayton, 2005). The following steps (as outlined by these authors) was undertaken to ensure the validity of the data contained in this thesis:

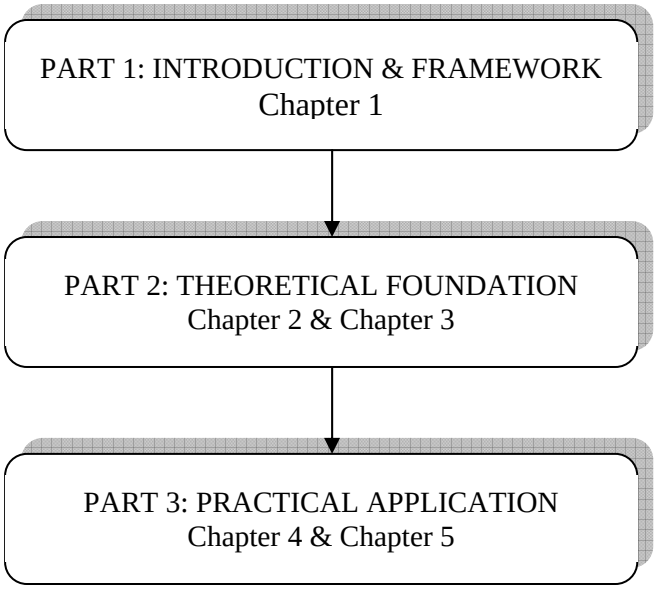
- Triangulation, where the collection of data from several sources was used;
- The full documentation of data, so that appropriate reference can be made to particular documents and other data sources in the event that they are challenged;
- Logical connections between what is examined and the conclusions drawn from this data;
- Self-reflection on the part of the author of this thesis, when she attempted to allow for her own perceived prejudices and bias; and
- An awareness of the limitations in both data obtained and the generalisability of the study.

1.6 RELEVANCE TO INFORMATION SCIENCE AND THE CONTRIBUTION OF THIS STUDY

This study will make a contribution to the research focus area of the meta-context of information. This is, along with Knowledge Management, a core research focus area of the Department of Information Science at the University of Pretoria. By demonstrating that the interaction and exchange of information between local knowledge systems of developing communities and the global knowledge system can help in their progress towards the global information and knowledge society, a contribution can be made to these research areas. Furthermore, this thesis will act as a guideline for developing countries to use to measure whether they are an information and knowledge society or not. If not, this thesis will then contribute to the development process of those countries, by providing possible solutions and recommendations to overcome the barriers that hinder them in becoming information and knowledge societies.

1.7 OUTLINE OF THIS THESIS

This thesis will follow the following outline:



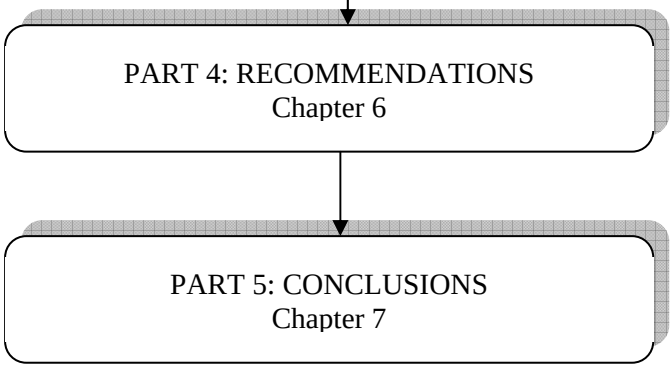


Figure 1.1: Outline of the thesis

1.8 CURRENT RESEARCH

The following books and articles have been singled out as some of those most relevant for this study. Based on a literature survey, the author will highlight contributions to this field of study. The list is not exhaustive, but covers some of the main contributions:

- Frank Webster (1995; 2002) is a very prominent author on the topic of the emerging information society. In his book, *Theories of the Information Society,* he sets out to examine and assess the variety of theories concerning this society. Frank Webster is a Professor of Sociology at the Oxford Brooks University.
- *Developing the third world: a communication approach* by Robert Agunga (1997), is a very valuable book for understanding the position of the third world regarding information dissemination from the perspective of development communication.
- J. Servaes' (1999) book, *Communication for development*, is an authoritative book in the study field of information for development, and addresses practical concerns in the communication of information for development using a participatory approach as well as a critique of the western, male-dominated research paradigm.
- The book *Measuring the impact of information on development* by Michel J. Menou (1993), gives a good overview and definition of how effectively information can be used for development purposes. It poses a challenge for the Information Science community, namely to identify

meaningful qualitative or quantitative parameters, by which the overall socio-economic impact of information programmes can be assessed.

Because of the huge number of internet and journal articles on the subject, only a few of the most relevant articles will now be highlighted:

- The issue whether Africa is moving towards the information and knowledge society is addressed in the article “Africa as a knowledge society: A reality check” by J.J Britz *et al* (2006). The authors of the article discuss the current initiatives that are undertaken in Africa to ensure inclusion within the information and knowledge society. Four interrelated pillars of a knowledge society are defined, and the main findings of their analysis are that Africa as a continent still has very far to go to become a true knowledge society.
- Information poverty, one of contributing factors to the digital divide, is discussed in the article “To know or not to know: a moral reflection on information poverty” by J.J Britz (2004). This article looks at information poverty from an ethical and moral perspective, as one of the biggest challenges facing the world today. The author argues that information poverty is a matter of social justice and has profound ethical relevance. This article was of significant importance to the author of this thesis, seeing that broad ethical principles are formulated which can be used to guide the social, economic, and political initiatives to solve information poverty and help bridge the digital divide.
- The article “Using information and communication technologies (ICT) for development at centres in rural communities – lessons learned” by D.P. Conradie (1998), summarises the lessons learned regarding the effective use of ICTs for development purposes. Conradie discusses the range of centres that exist that provide ICT services to communities and describes the activities that typically occur at such centres throughout the world. Furthermore, he attempts to develop a typology of such centres.
- The value of indigenous knowledge for development is emphasised in the article “Modernization and indigenous knowledge” by Kimberly

Pfeifer (1996). This article analyses the Western writings on indigenous knowledge and modernisation and then, in the article "Indigenous Knowledge, emancipation and alienation" by Thomas Heyd (1995), the differences between indigenous knowledge and "scientific knowledge" are highlighted.

- Thierry Bardini's (1992) working paper, "Linking indigenous knowledge systems and development: the potential uses of microcomputers," proposes a multidisciplinary framework to the classical model of the diffusion of innovations, and analyses the potential uses of microcomputers for development.
- The article "New Information and communication technologies: social development and cultural change" by Hamelink (1997), addresses the quest for new ways to capture, store, process, transport, and display information by using contemporary technological innovations. According to Hamelink, expert opinions differ about whether the impact that this technology will have on society will be positive or negative.
- The article "Information and development: towards an understanding of the relationship and Information and development: some reasons for failures" by Boon (1992), is a very valuable article that summarises the theory and definitions of information for development as found in vocational and academic literature.

1.9 LIMITATION OF CURRENT RESEARCH

During the literature review, it was found that substantial research has been done on indigenous knowledge in general, as well as on the impact that information has on development. However, very little research has been done on local knowledge systems and even less has been done on combining the local knowledge systems with the global knowledge system, especially in Africa. This was supported by a search on the Nexus database of the National Research Foundation. Thus, research on this topic will fill an important gap in the study area, Information for Development, one of the core areas of study in Information Science.

1.10 CHAPTER ALLOCATION OF THE STUDY

Chapter 1

This chapter provides an introduction and overview of the research problem and methods of investigation followed for the completion of this study. It includes a demarcation of the study, the limitations, definitions of terms, and a list of abbreviations.

Chapter 2

This chapter together with Chapter 3, forms part of the theoretical foundation and provides the reader with a brief historical perspective of the Information Science domain, as well as with a better understanding of the concepts data, information, and knowledge as applied in this thesis. The underlying relationship between these concepts is elaborated on and discussed in this chapter. This chapter further clarifies the concepts global-, western-, and scientific knowledge as well as indigenous-, traditional-, and local knowledge, as these concepts form the foundation on which the thesis is grounded. The author also discusses the relationship between information and development, as this relationship is one of the pivotal points on which the thesis is centred. The chapter is concluded with a discussion on the information life-cycle and an indication is made of how modern information communication technologies have changed the nature and life span of information within this life-cycle.

Chapter 3

In this chapter, the author discusses the phenomenon of the global information and knowledge society as one of the opportunities presented by globalisation. Unfortunately, not many people in developing countries can benefit from this global phenomenon and are excluded from being part of this society. For this reason, this chapter investigates the very nature of an ideal information and knowledge society. Firstly, the term information and knowledge society is defined and the author takes a closer look at the evolution of this concept. Secondly, the author discusses the criteria and characteristics of the information and knowledge society that can be used by countries and communities to judge their current status on the path towards

becoming an information and knowledge society. The author further investigates the potential advantages as well as disadvantages associated with becoming information and knowledge societies. The chapter is concluded with a discussion on the impact that greater access to information, due to participation within the information and knowledge society, has on various aspects of life, such as the manufacturing industry, business and finance, education and training, and medicine and health.

Chapter 4

Chapters 4 and 5 are part of the practical application of this thesis. In chapter 4 the author discusses globalisation as the process that allows the possible interaction and exchange of data, information, and knowledge between local knowledge systems and the global knowledge system in developed countries. For the purpose of this thesis, America and Norway are used as examples of developed countries. Firstly, the concept “developed” is defined. Secondly, globalisation as a concept, as well as the process thereof, is defined. Attention will be given to the various dimensions of globalisation, as well as to the characteristics thereof. An important characteristic of globalisation added by the author is the inclusion of the developed country/community within the information and knowledge society, due to the constant interaction and exchange of data, information, and knowledge between the developed countries’ local knowledge systems and the global knowledge system. This chapter is concluded with a discussion on whether this interaction and exchange, which is prevalent in developed countries, will assist the developed country to comply with the stated criteria of the information society and can thus become information and knowledge societies.

Chapter 5

In this chapter, the second part of the practical application of this thesis, the author investigates whether developing countries can benefit from globalisation, due to the growing digital divide that is present within these countries. This divide is probably the most publicised challenge developing countries have to face, and this existing digital divide is discussed in greater detail than in Chapter 3. This is followed by a discussion on the exclusion of

developing countries from becoming information and knowledge societies. For this purpose, the author will refer to two developing countries, Niger and South Africa, and apply the criteria for the information and knowledge society (as discussed in Chapter 3) to these two developing countries to investigate to which, if any, the developing countries adhere. The chapter is concluded with a discussion on the barriers that the developing countries need to overcome in order to become information and knowledge societies in future. These barriers are the criteria of an information and knowledge society, to which the developing country does not adhere, and are, thus, barriers in the path towards becoming information and knowledge societies.

Chapter 6

This chapter forms part of Part 4, the recommendations of this thesis, and will supply the reader with a diagrammatic representation to summarise the central problem of this thesis. In this diagram, it is clearly indicated that information from the global knowledge system needs to be contextualised by the country in order to make this information applicable to their specific situation. This model is presented for a better understanding of the central problem statement. This chapter is concluded with proposed solutions and recommendations that developing countries can use to overcome the barriers prohibiting them from becoming information and knowledge societies in future.

Chapter 7

In Chapter 7, the final conclusions are reached by evaluating whether the central problem and the sub-problems of this thesis have been addressed. This chapter is concluded with some personal lessons the author learned during the writing of the thesis.

1.11 EXPLANATION OF KEY TERMS AND ABBREVIATIONS

1.11.1 Key terms

Term:	Definition:
Data	Data can be defined as raw facts, the representation of information, and it has no meaning (Madden, 2000).
Information	Any input that can be processed intellectually or cognitively for the development of meaning (Boon, 1992). Information is processed data, the things that we know, and has meaning. Information is usually thought of as, in a strict sense, a subset of data (Madden, 2000).
Knowledge	Information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and actions (Davenport *et al*, 1998). Knowledge as the human expertise stored in a person's mind, gained through experience, and interaction with the person's environment (Sunasee & Sewery, 2002).
Indigenous knowledge	Knowledge held by people from a particular locality (Heyd, 1995).
Local knowledge	Local knowledge describes the totality of information and experience gained over long periods of time in a given community. It incorporates local traditions and reflects the ongoing adaptation to socio-economic, cultural, and environmental conditions. (Knabe & Nkoyok, 2006).

Information technology	The general term for the equipment used to store and process information: computers, copying machines, printing machines, and other devices (Hawkins, 1991). A broad subject concerned with aspects of managing and processing information (Wikipedia, 2005)
Information communication technology	The use of modern technology to aid the capture, processing, storage, and communication of information, whether in the form of numerical data, text, sound, or image (Carter, 1991).
Information poverty	Information poverty is that situation in which individuals and communities, within a given context, do no have the requisite skills, abilities or material means to obtain efficient access to information, interpret it, and apply it appropriately. It is further characterised by a lack of essential information and a poorly developed information infrastructure (Britz, 2004:194).
Information and knowledge society	An information and knowledge society is a society where: • knowledge has become the most important production factor; • there is a culture of knowledge production underpinned by a higher level of education; and • the focus is not only on the use of modern ICT but also on content. (Britz *et al*, 2006:27)

1.11.2 Abbreviations

Abbreviation:	Meaning:
ADL	African Digital Library
ATU	African Telecommunication Union
AU	African Union
CPO	Citizen Post Office
CPRC	Chronic Poverty Research Centre
DLC	Democratic Leadership Council
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GI	Global information
GIS	Global information society
GKS	Global Knowledge System
HDI	Human Development Index
ICDL	International Children Digital Library
ICT	Information Communication Technology
IKDM	Indigenous Knowledge Development Monitor
IKS	Indigenous Knowledge System
IKWW	Indigenous Knowledge World Wide
IMF	International Monetary Fund
IT	Information technology
ITU	International Telecommunication Union
LIFE	Literacy Initiative for Empowerment
LKS	Local Knowledge System
NEPAD	New Partnership for Africa's Development
OECD	Organisation for Economic Co-Operation and Development
PAIA	Promotion of Access to Information Act
PIT	Public Information Terminal
SA	South Africa
TC	Telecentre

TISSA	Telephone Interpreting Service for South Africa
TRIPS	Trade Related Aspects of Intellectual Property
U.S.A	Universal Service Agency
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNDP	United Nation Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organisation
WIPO	World Intellectual Property Organisation
WSIS	World Summit on the Information Society
WTO	World Trade Organisation