CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Libraries around the world face many challenges. These include acquisition of an ever-increasing number of resources, inadequate budgets, and changing user needs and expectations. Providing good quality services has always been a special aim of academic and research libraries, and libraries have traditionally responded to these challenges through collaboration. Library co-operation has been in existence for a long time and involves sharing resources through activities such as inter-library lending and document delivery, co-operative cataloguing, and the exchange of staff. For example, Bostick (2001) traces the literature on library co-operation to the 1880s. Interlibrary lending is one of the oldest and most common forms of co-operation, involving sending requests via traditional modes of communication like the postal service. With technological developments and the introduction of library systems, libraries have changed their mode of operation to maximise access to resources. The need for formal modes of partnership, such as library consortia, became more pressing as budgets shrank and the need for access to information grew.

Recently, there has been rapid growth in library networks, with a total of 422 networks or consortia identified in the United States of America (USA) and Canada, as reported by the American Library Network (Woodsworth and Wall, 1991). Albeit at a slower pace, African libraries also established consortia, with the Republic of South Africa ranking high with five library consortia (Jalloh: 1999). The benefits of a consortium include cost-

reduction, enhanced and increased usage of resources, improved inter-library loan services and more effective negotiation with publishers (Kopp, 1998; Allen and Hirshon, 1998; Nfila, 2002; Woodsworth and Wall, 1991).

Academic libraries have been at the forefront of co-operative activities, as noted by Woodsworth and Wall (1991). This is because academic libraries strive to make resources available for teaching, learning, and research purposes. They also continually review their roles in information provision as challenges continue to emerge. Adams (1986) and Jordan (1998), for example, agree that factors such as increased student enrolment, a decline in library expenditure, increased prices of books and journals, and an increase in students studying off-campus have pointed to the need for academic libraries to examine their roles and how they can contribute meaningfully to developments in higher education.

South African academic libraries have also been affected by such changes brought about by technology, reduced funding and current global economic trends. Library consortia have been established in many parts of the country. According to Darch and Underwood (1999), there are five major library consortia in South Africa, namely:

- Cape Library Consortium (CALICO);
- Eastern Seaboard Association of Libraries (eSAL);
- Free State Libraries and Information Consortium (FRELICO);
- Gauteng and Environs Library Consortium (GAELIC); and
- South Eastern Academic Libraries (SEALS)

GAELIC is an academic library consortium, and has grown to become the largest in South Africa, with 16 member institutions. It was founded in 1996 in response to, "changing technological requirements in the higher education sector in South Africa, the call by government for tertiary institutions to co-operate and become more cost-effective, and the severe budgetary constraints being experienced by libraries." (GAELIC, 2003). Its vision is to create a virtual library with local service interfaces, forming part of a global information community for clients in Gauteng and its environs. Through its INNOPAC Systems Workgroup, it has coordinated and implemented the INNOPAC library system in all member libraries.

The INNOPAC library system is based in the United States of America and is used in different parts of the world. It is a product of the Innovative Interfaces Inc (III), a USA company established in 1978. It is being used in more than 40 countries by all types of libraries (III, 2005). This web-based system offers versatile modules that allow the effective storage and retrieval of information.

Before the INNOPAC library system was implemented in GAELIC, member libraries were already using their own systems with their own peculiarities. This gave rise to many problems during the conversion to a common library system, such as the conversion from different machine-readable cataloguing (MARC) formats to USMARC (United States machine-readable cataloguing) and to ensure that records are of good quality, and to facilitate staff training.

FRELICO came into existence officially in 1998 when its eight members signed an agreement of co-operation. The goal of FRELICO is to, "develop a comprehensive plan for using electronic networks to provide mutual and enhanced access to learned information to users of participating institutions of FRELICO" (FRELICO, 2005). Its two largest academic libraries (Central University of Technology Library and the University of Free State Library) have successfully implemented the INNOPAC library system through partnership with GAELIC.

Other South African consortia have been established in different regions of the countries. These are CALICO, which is located in the Western Cape Province; eSAL in the Kwazulu-Natal Province; and SEALS in the Eastern Cape Province (see section 2.4.3.1)

There has been an increase in the adoption of the INNOPAC library system in many libraries/library consortia in the wider Southern African region. Examples include libraries of the Botswana College of Agriculture, the National University of Technology (Zimbabwe), the University of Botswana, the University of Namibia, the Universidad Eduardo Mondlane (Mozambique), and the University of Zimbabwe, whilst the National University of Lesotho is seriously considering its implementation. As the strongest member of the Lesotho Library Consortium, it is likely that its adoption of the INNOPAC library system will influence the choice of a common system for this consortium.

The Lesotho Library Consortium (LELICO) was founded in 2003 and consists of 12 libraries (academic, national, and special). Its purpose is to provide information and

documentation services to members by harnessing and sharing national and international resources through the utilisation of information and communication technologies (ICTs). Only three of its members are fully computerised. It has become both urgent and necessary for this consortium to consider implementing a common library system, so that it can share resources and fully utilise the online resources that it has already acquired. Unlike GAELIC, LELICO is very small, and it is a multi-type library consortium. Implementing the INNOPAC library system in this consortium will present challenges. However, there are many lessons to be learned from GAELIC and FRELICO, which have been using the INNOPAC library system since 1997 and 1999 respectively, and from other consortia and libraries in the Southern African region. There is, therefore, a need to evaluate the introduction and performance of the INNOPAC library system in GAELIC, FRELICO and other libraries in the region to expose the advantages and limitations for LELICO. It is useful to examine the performance of these consortia and libraries as they are neighbours of Lesotho's where LELICO is located. Because of their geographical location, lessons learned from their experiences are likely to benefit LELICO.

Lesotho is a small country with a population of 1.8 million and is situated in the Southern African region where it is completely surrounded by the Republic of South Africa. The size of Lesotho is 30 355 sq km. (Lesotho, 2008). The library sector began with two main libraries: the National University of Lesotho (NUL) and the Lesotho National Library Services (LNLS) and has now grown to about 50 libraries (Makara, 2002). The NUL Library was opened in 1966 (NUL Library, 2005) and the LNLS was established in 1976 (Lesotho Review, 2008).

Although several factors affect the running of a consortium, the role played by information technology should be highlighted. Kopp (1998) indicates that information technology continues to be an instrumental tool in consortium. It is this critical role that makes library systems worth evaluating and to examine their performance in relation to desired goals and objectives. An evaluation of a common library system in a consortium is important since several member libraries are affected. GAELIC consists of 16 libraries, now merged into nine libraries, while the five FRELICO libraries have merged into two. Thus, the INNOPAC library system affects thousands of library users and staff members, and impacts on the management structures of the participating institutions.

Evaluation has generally been accepted as an essential element for measuring and ensuring effectiveness and efficiency in library services. An assessment of different library systems is essential before selecting and implementing an appropriate one; it is also necessary to evaluate a system after it has been implemented and operational for a significant period. This is done to check whether or not the system is performing to expectation, its functionality and the most important problems. Evaluation research not only assesses the merits and worth of a product, but weighs the costs against the benefits derived from it (Joint, 2006; Gray, 2004; Nicholson, 2004; McMillan and Schumacher, 1989).

Rowley (1980; 1988) identifies six stages of evaluation in system analysis and design:

- Definition of objectives;
- Evaluation of options (feasibility study);

- System definition;
- System design;
- Implementation; and
- Evaluation.

The final stage is post-implementation evaluation, which is an important focus of this study and is deemed to be a vital step in system design. Farajpahlou (1999), Matthews (1980), and Underwood (1990) for example, highlight the following benefits of post-implementation evaluation:

- A revised and strengthened (from the library's viewpoint) maintenance contract; and
- The identification of possible modifications that can be discussed with the vendor to improve the system.

Rowley (1988) agrees that recommendations arising from this kind of evaluation can assist in maintaining a sound relationship with the system vendor, as necessary modifications will need to be implemented.

GAELIC was the first consortium in South Africa to implement the INNOPAC library system and it is also the largest in terms of the number and the size of member libraries. Darch, Rapp, and Underwood (1999) indicate that GAELIC is one of the two better developed consortia when compared with other South African consortia. Therefore GAELIC appears to be the most suitable for evaluation, more especially because other consortia in the country and in the Southern African region, such as the Lesotho Library Consortium are considering opting for a common INNOPAC library system. Another

consortium that is worth examining is FRELICO, which is Lesotho's closest South African neighbour, the Free State Province. FRELICO implemented the INNOPAC library system in 1999 and participates in GAELIC's training initiatives (FRELICO, 2006).Three other libraries from the Southern African region that are worth considering are the Botswana College of Agriculture, the National University of Science and Technology (Zimbabwe) and the University of Namibia. They have already implemented the INNOPAC library system and together with the two South African consortia, will provide insight into how best to implement the system in a small, multi-type consortium like LELICO.

1.2 STATEMENT OF THE PROBLEM

Assessing the performance of library systems in consortia in a developing country is a useful exercise as library systems have played an important role in libraries and information centres by managing housekeeping activities more effectively and efficiently and by providing better access to library resources. With the emergence of consortia, it has become necessary to assess the performance of different library systems to improve the exchange of information among libraries.

The INNOPAC library system will be the central focus of this study as it is a valuable instrument for sharing information among GAELIC, FRELICO and other libraries in the Southern African region.

The study poses the following principal research question: **What are the successes and limitations of the INNOPAC library system for selected consortia and libraries in the Southern African region, and how can these guide the implementation and management of this system in the Lesotho Library Consortium?**

To answer this question, the study will seek to find answers to the following sub-questions:

- Which criteria are required for a comprehensive evaluation of the INNOPAC library system in consortia and libraries in the Southern African region?
- What are the successes and limitations of the INNOPAC library system in selected consortia and libraries in the Southern African region?
- What benefits and impact have the INNOPAC library system had on selected consortia and libraries?
- What are the costs versus benefits of the system?
- What are the system requirements of LELICO members and which system management model would work best for it?
- Given its special challenges, what critical lessons can LELICO learn from selected consortia and libraries in the Southern African region in order to guide the implementation and management of the INNOPAC library system?

1.3 METHODOLOGY

Both qualitative and quantitative methods will be used to investigate the research problem, however, the overall approach is a qualitative one. The aim will be to use both

kinds of methods in a complementary manner to gain insight into the problem, and to find out how well users judge the system on the basis of their experience, needs and expectations. A fuller treatment of the methodology is provided in Chapter 3.

The following are the target groups for this study:

- Library staff of five GAELIC libraries and two FRELICO libraries;
- System librarians of five GAELIC libraries, two FRELICO libraries, and three libraries in the Southern African region;
- Library directors of five GAELIC libraries, and two FRELICO libraries;
- The project manager of SEALS; and
- Twelve library heads of LELICO member libraries.

The choices and numbers are fully motivated in Chapter 3.

The system will be assessed using four types of data collection techniques, namely,

- Literature review;
- Questionnaires;
- Interviews and
- Site visits.

1.3.1 Literature search

An exhaustive literature review and analysis of library systems evaluation research is undertaken. The principal sources of information for this study are the extant literature on

the INNOPAC library system and policy documents of GAELIC, FRELICO and other libraries, which includes any documentation dealing with the implementation and use of the system. The literature review produces a framework within which there is a complete evaluation of the INNOPAC library system, and generates guidelines for constructing effective questionnaires. The performance evaluation criteria are adapted from recommendations by Lancaster (1977), Badwen (1990), Besemer (1987), Chisenga (1995), Farajpahlou (1999), Hernon and McClure (1990), Rossi and Freeman (1985), and Van House, Weil and McClure (1990).

1.3.2 Questionnaires

A survey of member libraries uses five sets of questionnaires administered to the management of selected GAELIC and FRELICO libraries, system librarians of selected GAELIC, FRELICO and three libraries in the Southern African region, library professionals and 12 library heads of LELICO member libraries. Although the end user is deemed important in the evaluation of a library system, the study only focuses on library personnel as users of the system.

Questionnaire data covers the following:

- The level of satisfaction of staff about the system and how well the system is performing in GAELIC, FRELICO and other Southern African libraries;
- The benefits and impact the system has had on GAELIC FRELICO and other Southern African libraries;
- Use of support systems for the INNOPAC Library system;
- Automation status of LELICO member libraries;

- Types of library systems and modules used by LELICO members;
- Nature of problems encountered with the system in use;
- System requirements for LELICO common library system; and
- Budgets of LELICO member libraries.

1.3.3 Interviews

Structured interviews provide a clearer picture of issues raised in questionnaires and solicit ideas on the resolution of identified problems. Interviews were undertaken with three GAELIC system librarians, two FRELICO systems librarians and one system librarian each from other Southern African libraries. The SEALS project manager was interviewed to gather information on the advantages and disadvantages of a centralised server management model for a small consortium. All GAELIC and FRELICO libraries use their own servers to store data. SEALS provided useful information for a comparison of centralised and decentralised server models.

1.3.4 Site visits

Site visits were made to a sample of five libraries (three from GAELIC and two from FRELICO) to increase the reliability of the instruments mentioned above. The visits gathered information on:

- the availability of system modules;
- the availability of other electronic services such as the Internet;
- how members access each other consortia's holdings; and
- how library sections responsible for the system are staffed.

1.4 SIGNIFICANCE OF THE STUDY

The study is evaluative in nature; it examines various aspects of the INNOPAC library system to determine its performance in a consortium environment. Specifically, the study:

- looks for effective ways of introducing the INNOPAC library system in the Lesotho Library Consortium as an example of a small, multi-type and newly-established consortium;
- identifies successes and limitations related to the performance of this system;
- benefits many Southern African academic libraries already using, or considering the implementation of the INNOPAC library system;
- proposes a suitable approach to implementing the INNOPAC library system; and
- provides useful information to the INNOPAC library system vendor on future product development plans and the requirements of small consortia and individual libraries in developing countries.

1.5 LIMITATIONS

1) The study focuses only on GAELIC, FRELICO and three selected libraries in the Southern African region. Since these are not the only consortia and libraries using the INNOPAC library system in Southern Africa, the findings will not necessarily reflect the views of all libraries in the region.

2) All GAELIC and FRELICO members are academic libraries. This peculiarity shapes the findings of the study, and makes it difficult to generalise in cases where different types of libraries are represented. For example, Lesotho Library Consortium is a

multi-type library consortium with its own special challenges and needs – the study deals with this matter in Chapter 6; also, according to Darch and Underwood (1999: 27) GAELIC is located in the "smallest but richest and most economically dynamic province" of South Africa and is likely to reflect this privileged character in its library resources and services.

3) The study highlights the management of INNOPAC library system, and is limited to library personnel as users of the system. As Badwen (1990: 6) indicates: "information professionals are the users of the system in the sense of being searchers, intermediaries, operators, providers and maintainers," their participation in the study is therefore deemed relevant. Another limitation of the study is that the end-users will be excluded.

1.6 DEFINITION OF KEY TERMS

Cost-benefit analysis: Refers to a justification for the expense of providing a service in terms of benefits derived from it (Hernon and McClure, 1990: 5). Cost-benefit analysis weighs the benefits against costs incurred to achieve the desired effect.

Effectiveness: The extent to which the needs of the user are satisfied, or the extent to which the overall objectives of the system are met (Hernon and McClure, 1990: 1).

Efficiency: How well the library system addresses the needs of users.

Evaluation: "The process of identifying and collecting data about specific services or activities, establishing criteria by which success can be assessed, and determining both the quality of the service and the degree to which the service accomplishes stated goals and objectives "(Hernon and McClure, 1990: 1).

Information and communication technology: Electronic technologies for collecting, storing, processing and communicating information. They can be separated into two main categories: (1) those that process information such as computer systems, and (2) those that disseminate information such as telecommunication systems (Butcher: 2000).

Information system: A data processing technology used for collecting, processing, storing and retrieving information to satisfy a variety of needs (Harrod, 1995: 322).

Library consortia: "Resource sharing organisations formed by libraries; also referred to as co-operatives, networks, collectives, alliances, or partnerships. These organisations share services such as collection development, education and training, preservation, centralised services, and network alliances featuring library automation services, systems support, consultation, and administrative support for cataloguing, interlibrary lending, union listing, retrospective conversion, and co-operative purchasing." (Harrod, 1995: 161).

Resource sharing: Involves sharing of library functions by a number of libraries, to provide a positive net effect on the library user and on the budget (Kent and Lancour, 1972: 295).

1.7 CHAPTER OUTLINE

Chapter One introduces the study and provides a background to library co-operation and evaluation of library systems. It covers the statement of the problem, methodology, significance of the study, definition of terms and limitations.

Chapter Two is a literature review, which includes literature on library co-operation, consortia, evaluation and library systems. It also covers developments that led to library co-operation and eventually to consortia, and the successes and limitations encountered. The current situation regarding the use of the INNOPAC library system in South Africa and other Southern African region is reviewed. Background information of the Lesotho Library Consortium is provided and some evaluative studies on the INNOPAC library system are reviewed.

Chapter Three describes the design of the study, which includes the participants in the study, sampling techniques, and methods of data collection. Steps taken to ensure data reliability and validity are discussed. The chapter also shows how data is analysed.

Chapter Four presents an analysis of data. Information collected from the literature, questionnaires, and interviews and site-visits are analyzed and presented.

Chapter Five offers an interpretation of the data, and makes informed interpretations of the data presented in the previous chapter. It gives reasons for general patterns observed in the data and offers possible solutions to identified problems.

Chapter Six is a critique, using successes and limitations, with a view to generate guidelines to implement the INNOPAC library system in the Lesotho Library Consortium. It makes recommendations on the method of INNOPAC library system's adoption. In proposing a model for the implementation of the system, the chapter provides a recommendation on the kind of system management to be employed, the functions of the system and the mode of operation by LELICO members.

Chapter Seven discusses the findings of the study in relation to the principal research question and sub-questions. It reaches general conclusions based upon the findings of the study and makes recommendations and identifies areas for future research.

1.8 CONCLUSION

Chapter one introduced the study by providing background and discussing the issues that led to the statement of the problem. The methodology for gathering information to be used was discussed. This identified target groups and data collection methods to be used. The chapter showed the significance of the study its benefits to various stakeholders. It also highlights the limitations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Libraries have a long history of working together. The term 'library co-operation' is defined by Edmonds (in McDougall and Prytherch, 1991: 9) as the, "*reciprocally beneficial sharing of resources, developed or pre-existing, by two or more bodies*". Over the years, library co-operation has evolved into terms such as 'collaboration', 'partnerships', 'networking', 'resource sharing' and more recently, 'consortia'. The need to share resources for the benefit of the user is felt and driven more by academic libraries, which have led to the formation of many academic library consortia world-wide.

This chapter discusses factors that led to the development of library co-operation and consortia. It begins with developed countries, where modern libraries have been in existence for a relatively longer time. The situation in developing countries follows, with a special emphasis on countries in Africa. The main focus is on GAELIC, FRELICO and three libraries in the Southern African region, whose lessons in implementing the INNOPAC library system are used. The chapter also covers the Lesotho Library Consortium (LELICO), which is a small consortium in Southern Africa. Finally, the chapter describes success factors in the management of library consortia, and constraints and challenges in managing library consortia. The outcome of this chapter is the criteria for a comprehensive evaluation of the INNOPAC library system.

2.2 Motivation for library co-operation

Although a range of motivations have led to the formation of partnerships among libraries, the core driver is the realisation that no library can be self-sufficient in fulfilling users' needs. This move from "organisational self-sufficiency to a collaborative survival mode" (Allen and Hirshon, 1998: 1) is an important development, especially for academic libraries. According to the System Development Corporation (SDC) study, which looked at academic library consortia between 1931 and 1972, consortia are seen as the panacea for many of the long-standing problems in libraries. That study (Kopp, 1998: 9) identified the three most commonly cited objectives for forming consortia, namely to:

- share and improve resources;
- achieve some single purpose; and
- reduce costs.

The proliferation of computers in libraries during the 1960s is another factor that led to the development of a number of consortia, as libraries sought expertise on library automation (Jalloh, 2002: 205). According to Allen and Hirshon (1998: 37), from the mid-1980s to 1990, library consortia development was motivated primarily by three reasons, namely to:

- leverage resources by sharing existing collections or resources through virtual union catalogues, or through collective document and material delivery services;
- reduce the cost of member library operations; and
- affect how information is created, marketed, and purchased by libraries.

These motivations reflect the primary need for libraries to make their collections more widely accessible to users, in a cost-effective manner. Other sources (Jalloh: 2000; Nfila and Darko-Ampen: 2002; Woodsworth and Wall: 1991) concur with these observations, pointing to a number of reasons for the establishment of library consortia in both developed and developing world. The most common factors are related to:

- economic factors ;
- advancement of information technology; and
- quality improvement.

The need to ensure quality in consortia cannot be over-emphasised, more so because an exchange of records takes place easily in technological environments within which most consortia operate and it is necessary for members to maintain good quality records that adhere to certain standards.

2.3 Library co-operation in developed countries

Libraries have co-operated for an extensive period via activities such as inter-library lending, the compilation of union lists and staff training. As indicated in the previous section, terms such as 'partnership', 'collaboration', 'association', 'networks' 'resource sharing', 'co-operatives' and 'consortia' have been used to describe many facets of library co-operation. Kopp (1998: 8) traces the historical developments of 'library operation' in the USA to the following documents:

- '*Grouping of places for library purposes*' by G.L. Campbell, in 1879;

- Reports of the Cooperation Committee of the American Library Association (ALA), which appeared in the *ALA Bulletin* in the 1880s; and
- A Library Journal by Melvil Dewey on 'Library Cooperation', in 1886.

He notes that such 'partnerships' or 'association' were not generally in use until the 1820s, although the terms were still used a century later by manufacturing and banking enterprises, and in the 1950s and 1960s by the science and education disciplines. 'Resource sharing' is another relatively new term for library co-operation. However, Odini (1991: 93) differentiates between the two by describing resource sharing as a broader term that "assumes a range of physical, intellectual and conceptual resources on the one hand and a body of people with library and information needs on the other, and covers the activities involved in organizing the one into a set of optimum relationships to meet the needs of the other". He adds that library co-operation takes the existence of libraries for granted and describes how they can be optimally employed through collaboration.

Although the date for the first use of the term 'library consortium' is uncertain, the USA has witnessed a rapid growth in library consortia (Kopp, 1998: 7). One of the earliest consortia was the Triangle Research Libraries Network, which was formed in 1933 (Bostick, 2001: 1). In 1972, a study commissioned by the United States Office of Education identified 125 academic library consortia, ninety per cent of which were formed in the 1960s. Since then, there has been a remarkable growth of library consortia in the USA, which can be attributed to technological developments, which not only

enabled libraries to share information among themselves, but facilitated access to resources beyond geographical barriers.

In the United Kingdom (UK), the term 'co-operatives' is used synonymously with the term 'consortia'. Thirty-one library co-operatives were identified in 2000. According to Moore and Pilling (in Pilling and Kenna, 2002: 15), these cooperatives are operating in the five areas of:

- collection development;
- preservation and retention;
- access;
- bibliographic services; and
- record creation.

Fletcher (in MacDougall and Prytherch, 1991: 159) notes that libraries in the UK formed the Consortium of University Research Libraries (CURL) in 1982. Members include the libraries of the universities of Cambridge, Edinburgh, Glasgow, Leeds, London, Manchester and Oxford. Its major project involved the establishment of the Joint Academic Network (JANET) through which a database of bibliographic information on members was created. Other bodies that have been in the forefront of collaborative ventures in the UK include the Standing Conference of National and University Libraries (SCONUL), the British Library, the Library Association, and the Council of Polytechnic Librarians.

2.4 Library co-operation in developing countries

A developing country is defined as: "*A country in which large segments of the economy are still comparatively underdeveloped and the majority of the population is very poor; sometimes referred to as 'less-developed countries' (LDCs)*" (Welsh and Butorin, 1990: 309). Most of the developing countries are in Africa, Asia and Latin America.

Despite political and financial constraints, libraries in developing countries have recognised the importance of library co-operation. This is indicated by various activities such as the inter-library lending, co-operative storage, and staff training in Latin America, Asia, Africa and the Caribbean (Massis, 2003; Gorman and Cullen, 2000; Lor and Hendrikz, 1993).

2.4.1 Co-operation in Latin America and the Caribbean

A project worth mentioning in Latin America is the Asociacion de Estados Iberoamericanos para el Desarrollo de las Bibliotecas Nacionales de Iberoamerica (ABINA), which comprises 20 Latin American countries, Portugal and Spain. This UNESCO-sponsored project aims to build union catalogues and digital collections (Hiraldo in Massis, 2003: 11). A more recent project is the Latin Americanist Research Resources Project (LARRP), founded in 1995 and sponsored by the Association of Research Libraries (ARL) in the USA. It has created a Table of Contents Journal database of over 400 journals from Argentina, Brazil, and Mexico. It also operates an electronic document delivery service through the Ariel system.

There are also other USA-supported initiatives, one of the earliest began in 1930 with co-operation between Mexico and the USA in the area of library education. This involved training library personnel at USA universities, the provision of scholarships and an exchange of professors between the two countries (Rodriguez in Massis, 2003). Challenges that affect library co-operation in Latin America are discussed in section 2.6, together with other developing countries.

Ferguson (in Massis, 2003: 31) notes that a lot of effort and time has been expended in the Caribbean in support of conferences on library co-operation. He highlights the successful completion of projects such as c-operative indexing, the compilation of acquisitions lists and exchange programmes, which occurred under the umbrella of the Association of Caribbean University Research and Institutional Libraries (ACURL).

Latin America and the Caribbean are extensively engaged in library co-operation as illustrated by various activities in these regions. Foreign aid contributes positively towards the success of these cooperative initiatives.

2.4.2 Co-operation in Asia

Developing countries in Asia are making progress in library resource sharing, however, Asian consortia are in different stages of development, as observed by Gorman and Cullen (2000), which impinges on the advancement of resource sharing among libraries in the region. Nonetheless, a number of networks have been established, and go a long way towards meeting the information needs of users. Many collaborative efforts have

been made in Malaysia, Taiwan, and Thailand, but China and India are used as examples to highlight collaborative initiatives in Asia as these two countries are the largest.

The China Academic Library and Information System (CALIS) is a nation-wide academic library consortium (Yao, Chen and Dai, 2004: 277) founded in 1996 to provide infrastructure to enable smooth collaboration among its members. CALIS (Yao, Chen and Dai, 2004: 281) provides the following services:

- Virtual reference system;
- Chinese and foreign language dissertation and thesis abstracts and full-text database;
- Chinese and foreign periodicals database;
- Electronic reserved book database; and
- Management of imported resources.

Other major networks in China are the China Education and Research Network (CERNET), the China Network (ChinaNet), the China Golden Bridge Network (ChinaGBN) and the China Science and Technology Network (CSTNet) (Tang, 2001: 183).

The first library network in India was the DELNET (Delhi Library Network) which was established in 1980. DELNET has 86 member libraries. According to Kaul (1999: 220), its main objective is to promote resource sharing in Delhi and the neighbouring areas through:

- storing and disseminating information;
- offering computerised information services to users; and
- co-ordinating efforts for suitable collection.

Asia has attained many achievements in library consortia development, as it has been highlighted in this section.

2.4.3 Co-operation in Africa

Literature on co-operation in Africa brings to light the slow progress caused by a number of barriers and challenges generally linked to finance, technology, expertise and infrastructure (Alemna, 1998; Kargbo, 2002; Kisiedu, 1999; Mutula, 2004).

Despite numerous challenges in Africa, great strides have been made, especially in library co-operation and in consortia building. As in other parts of the world, inter-library lending in African countries is both the oldest and the most popular method of co-operation.

The SAIS (Southern African Interlending Scheme) has a membership of 768 libraries from Botswana, Lesotho, Malawi, South Africa, Swaziland and Zimbabwe (Baker, 2003). According to Raubenheimer (1998 (b)), membership is composed of national, research, university and college libraries. Members are able to access data on holdings of other members through the South African Bibliographic Network (SABINET) and can request materials directly from the members.

There has been an increase in the number of established consortia in the region. South Africa, for example, has five academic library consortia:

- Cape Library Consortium (CALICO);
- Eastern Seaboard Association of Libraries (ESAL);
- Free State Libraries and Information Consortium (FRELICO);
- Gauteng and Environs Library Consortium (GAELIC); and
- South Eastern Academic Libraries System (SEALS)

These consortia are discussed in Section 2.4.3.1.

Other countries in the Southern African region (Jalloh, 2000; LELICO, 2004; Molefe, 2003) that have made progress in consortia building are:

- Zimbabwe – the Zimbabwe University Library Consortium;
- Lesotho – the Lesotho Library Consortium;
- Botswana – Special libraries in this country have established a consortium; and
- Swaziland – There are plans to establish a national library consortium.

Ghana hosted a project in 1996 to form an electronic networking system in West Africa. It was sponsored by the IFLA (International Federation of Library Association and Institutions) Section on Document Delivery in partnership with the Danish International Development Assistance (DANIDA). According to Kisiedu (1999: 109), the members of this project are the:

- Balme Library of the University of Ghana;
- Library of the University of Science and Technology (UST);

- Library of the University of Cape Coast;
- Library of the University for Development Studies (UDS);
- Library of the University College of Education at Winneba (UCEW); and
- Ghana National Scientific and Technology Library and Information Centre (NASTLIC).

According to Kisiedu (1999: 110), the objectives of the project are to:

- establish electronic networking links with a regional and global approach;
- improve the competence of personnel in the participating libraries in handling interlibrary lending and document delivery systems in a more systematic way and with a national, regional and global approach;
- support negotiations with some major Western libraries and document supply centres; and
- develop the project as a model for emulation by other African countries which do not have such a system.

Odini (1998) conducted a study that reviewed the trends in information technology application in East Africa. He noted that while many libraries introduced IT, there was little co-operation among them. Mwinyimbewu (in Odini, 1998: 187) laments that this absence of co-operation has had a negative impact on funding bodies. He recommends that joint ventures are required as they enable the optimum use of scarce resources. This situation was noted by Rosenberg in 1992 in a study that examined the progress made by Kenyan libraries on information systems, resource sharing and networking, which found that resource sharing was deteriorating owing to the absence of national bibliographies

and shrinking budgets. Other barriers and challenges affecting East Africa and other developing countries will be discussed in section 2.6.

2.4.3.1 Library consortia in South Africa

According to Gerryts (in Marais, 2003: 21), library co-operation in South Africa was carried out on an *ad hoc* basis prior to 1975. In 1975, the Inter-University Library Committee (IULC) was founded by the Committee of University Principals (CUP). The aim of the committee was to investigate more effective resource sharing among university libraries. Among its recommendations, the committee suggested that a formal agreement on co-operation be made. A set of eight criteria for achieving this agreement among libraries wanting to co-operate was laid out as follows:

- Consensus regarding the process;
- A formal agreement in terms of the process;
- Formulating a policy through attracting and involving a number of institutions on a national level;
- A body of members with a controlling and co-ordinating function to promote and protect their interests;
- Voluntary participation in the co-operative infrastructure;
- Binding contractual obligations in terms of the co-operation agreement;
- Consideration of examples of similar agreements from other countries when drawing up an agreement; and

- An infrastructure within which member libraries are able to participate in collection management on a national level, document delivery, selection, retrieval and resource allocation.

Since the presentation of the framework of co-operation provided by the IULC, five academic library consortia have been established in South Africa, each of which has a regional focus with the common motivation of enabling better sharing of resources. These academic library consortia are discussed below.

2.4.3.1.1 Cape Library Consortium (CALICO)

CALICO was founded at the initiative of the Vice-Rectors' Group of the Western Cape Tertiary Institutions Trust (WCTIT), in 1992. It presented a proposal for funding to the Ford Foundation, following which a Ford Foundation team visited the five Western Cape institutions involved and agreed to the establishment of a library consortium (De Kock, Coetzee and Viljoen in Marais, 2003: 22). After this visit, the Western Cape Library Cooperation (WCLC) Project was established with the involvement of libraries of the following institutions:

- University of Cape Town;
- University of Stellenbosch;
- University of the Western Cape;
- Cape Technikon; and
- Peninsula Technikon.

Cape Technikon and Peninsula Technikon have now merged to become the Cape Peninsula University of Technology, and the University of the Western Cape now includes the University of Stellenbosch Dental School (*Sunday Times Higher Education:* 2005). The WCLC changed its name in 1994 to the Cape Library Consortium (CALICO). The aim of the consortium is to improve access to information at reduced costs (Alemna and Antei, 2002: 236). According to the Western Cape Tertiary Institutions Trust (in Marais, 2003: 23), CALICO's vision is:

> "To promote information literacy and economic development in a form users want, when, and where they need it. Inherent in this vision is the right of all citizens to be able to access, evaluate, and effectively use information that can contribute to improving their quality of life and economic well-being. Accordingly, the vision embraces the concept of a single Western Cape Library collection that is being housed at different locations with all resources accessible to anyone who has need of them."

To realise this vision, De Kock (in Marais, 2003: 23) reports that CALICO established the following working committees constituted by representatives from the five institutions involved:

- Document Delivery Working Group;
- Co-operative Journals Project;
- Van Service Committee;
- Team Building Committee;
- Working Group on a Shared Automated System;
- Committee on a Binding Policy;
- Committee on Consortium Structure; and
- Co-operative Staff Training Sub-committee.

CALICO is still one of the strongest library consortia in South Africa.

2.4.3.1.2 Gauteng and Environs Library Consortium (GAELIC)

GAELIC was founded in 1996. It is a major project of the umbrella consortium FOTIM (Foundation of Tertiary Institutions in the Northern Metropolis). Its beginnings can be traced to a visit by Andrew W. Mellon Foundation representatives in 1995, who met with seven universities and technikons to explore the idea of sponsoring a common library software within a consortium (Alemna and Antwi, 2002: 235; Darch and Underwood, 1999: 2; Edwards, 1999: 123; Marais, 2003: 24).

According to Edwards (1999), GAELIC was originally composed of the following institutions:

- Medical University of Southern Africa (MEDUNSA);
- Potchefstroom University of Christian Higher Education;
- Rand Afrikaans University;
- Technikon North West;
- Technikon Northern Gauteng;
- Technikon Pretoria;
- Technikon Southern Africa;
- Technikon Witwatersrand;
- University of Pretoria;
- University of South Africa (UNISA);
- University of the North;

- University of the North West;
- University of the Witwatersrand;
- Vaal Triangle Technikon;
- Venda University; and
- Vista University.

The table below illustrates ways in which some of these institutions have now merged or are being incorporated (*Sunday Times Higher Education*, 2005):

Table 1 GAELIC institutions after merging

Name	Institutions that formed the merger
University of Pretoria	University of Pretoria Vista University (Mamelodi)
University of Limpopo	University of the North (UNIN) Medical University of South Africa (MEDUNSA)
North-West University	Potchefstroom University of Christian Higher Education (PU for CHE) University of North-West (UNW) Vista University (staff and students of Sebokeng)
Tshwane University of Technology	Technikon Pretoria (TP) Technikon Northern Gauteng (TNG) Technikon North-West
Vaal University of Technology	Vaal Triangle Technikon Vista University (infrastructure and facilities of Sebokeng)
University of Venda for Science and Technology	University of Venda **Not merged** – only name change
University of Johannesburg	Rand Afrikaans University Technikon Witwatersrand Vista University (East Rand and Soweto)
University of South Africa	University of South Africa (UNISA) Technikon South Africa (TSA) Vista University of Distance Education Centre (VUDEC)
University of the Witswatersrand	**Not merged**

The vision of GAELIC is:

> "To create a virtual library with local service interfaces, forming part of a global community for clients in Gauteng and its environs. This will be achieved by a group of autonomous tertiary education information services, using technology and linked networks, which accept the need to explore co-operation and collaboration by consensus as a response to the formal education, training and information needs of the country." (Memorandum of Agreement in Marais, 2003: 25)

The mission of GAELIC is to fully utilise and develop the information resources of the Gauteng Province for the promotion of education, research and lifelong learning. According to Edwards (1999, 124-125), GAELIC agreed on the following objectives:

- To support the information needs of clients through co-operation, resource sharing and enhanced access to information, including electronic information;
- To provide common software to facilitate resource sharing and provide state-of-the-art systems capabilities in member libraries;
- To formulate appropriate collection development and acquisitions policies among members and to explore ways of saving costs;
- To utilise appropriate and up-to-date technology and to keep abreast of new developments;
- To improve information literacy among clients and to share training resources and expertise;
- To involve all interest groups through contact and collaboration; and
- To contribute toward the provision of information for the development of South Africa.

GAELIC set up a number of task groups and sub-groups, which to carry out specific tasks to ensure the fulfillment of its objectives (De Kock, 1997; Edwards, 1999). These were established as follows:

- Systems Task Group – responsible for researching a co-operative library system for GAELIC members, setting up system evaluation workshops, and organising consultancy for advice on the system. The task group was also responsible for final agreements and business strategies between parties;
- Resource Sharing Task Group with sub-task groups for document delivery, joint acquisitions, union list of current serial titles, and human resources;
- Cataloguing and Technical Services Workgroup (Gcats); and
- Networking and Infrastructure Task Group – responsible for the establishment of an information technology infrastructure to enable resource sharing.

Cognisant of the importance of forming strategic partnerships to facilitate its business, GAELIC decided to collaborate with the South African Bibliographic Network (SABINET), which has extensive experience of bibliographic data management. The National Library of South Africa (NLSA) is another strategic partner, and its director has observer status within GAELIC. In addition, the Free State Library and Information Consortium (FRELICO) is represented in steering committee meetings (Edwards, 1999: 125). These partnerships are believed to be essential for the mutual benefit of all the parties involved.

2.4.3.1.3 Free State Library and Information Consortium (FRELICO)

FRELICO was initiated by the University of the Free State, which sent a resource sharing proposal to Mellon Foundation. This resulted in the launch of the planning phase of FRELICO. In 1996, vice rectors or heads of institutions in the Free State Province met to discuss the involvement of their institutions in FRELICO (De Kock: 1997).

The following institutions participated in the planning stage of FRELICO:

- Bloemfontein Public Library;
- Free State Directorate for Information Services and Heritage;
- SASOL Technical Library Services;
- Technikon Free State;
- University of the North, Qwa-Qwa campus;
- University of the Free State;
- Vista University, Bloemfontein campus; and
- Vista University, Welkom campus;

Some of these institutions later merged as follows (*Sunday Times Higher Education*, 2005):

Table 2 FRELICO institutions after merging

Name	Institutions that formed the merger
University of the Free State	University of the Free State Vista University (Bloemfontein) University of the North (Qwa-Qwa)
Central University of Technology	Technikon Free State (TFS) Vista University (Welkom)

According to the Free State Libraries Project (in Marais, 2003: 27) the mission of FRELICO is to expand access to information, research and study materials in the Free State Province through electronic means. The goal is to develop a comprehensive plan for electronic networks to provide mutual and enhanced access to users of participating institutions. The five areas of co-operation were identified as follows:

- Shared computerised regional database/catalogue;
- Document delivery systems;
- Co-operative journals project;
- Information literacy programmes; and
- Training on technological issues related to information sciences.

FRELICO successfully implemented the INNOPAC library system in both the Central University of Technology and the University of the Free State in 1999. The other three libraries are no longer members of FRELICO (Ackerman, 2007).

2.4.3.1.4 Eastern Seaboard Association of Libraries (ESAL)

ESAL was founded in 1994 under the auspices of the Regional Institutions Co-operative Project (RICP) (Merrett, 1998: 27). It is composed of seven libraries from the following institutions:

- Natal Technikon;
- M. L. Sultan Technikon;
- Mangosuthu Technikon;
- University of Zululand;
- University of Natal, Durban;

- University of Natal, Pietermaritzburg; and
- University of Durban, Westville.

The new mergers are shown in the table below (Sunday Times Higher Education, 2005):

Table 3 ESAL institutions after merging

Name	Institutions that formed the merger
Durban University of Technology (DIT)	M.L. Sultan Technikon Natal Technikon
University of KwaZulu-Natal	University of Durban-Westville (UDW) University of Natal
University of Zululand	Not merged

According to Merrett (1998: 27-28), the mission of ESAL is:

> "To coordinate the resources of all the tertiary institution libraries on the eastern seaboard in order to develop a single resource base that will underpin teaching, learning and research in the area and in turn contribute to the national bibliographic network. In short, this means the maximum use of library resources within higher education both regionally and nationally, tighter integration of libraries into the academic process and the enhancement of the quality of research."

2.4.3.1.5 South Eastern Academic Library System (SEALS)

SEALS was based on an informal agreement made in 1989 and later evolved into a more formal structure in 1996. It comprises eight institutions, namely:

- Rhodes University;
- University of Port Elizabeth;
- University of Fort Hare;
- University of Transkei;
- Port Elizabeth Technikon;
- Border Technikon; and

- Eastern Cape Technikon.

These have now merged as follows (*Sunday Times Higher Education*, 2005):

Table 4 SEALS institutions after merging

Name	Institutions that formed the merger
University of Fort Hare	University of Fort Hare Rhodes University, East London Campus
Nelson Mandela Metropolitan University	University of Port Elizabeth (UPE) Port Elizabeth Technikon (PET) Vista University (Port Elizabeth)
Rhodes University	Not merged
Walter Sisulu University for Technology and Science	University of Transkei Border Technikon Eastern Cape Technikon

SEALS is sponsored by the Eastern Cape Higher Education Association (ECHEA), which was founded to "promote co-operative development of technikons and universities in the Eastern Cape" (ECHEA, 2006). SEALS implemented the Millennium Pac in 2001, which is the latest version of the INNOPAC library system. The consortium decided to manages its system centrally and the Rhodes University Information Technology Division (RUITD) hosts a shared server for participating institutions (SEALS, 2005).

Although South African library consortia have had many successes, they operate with some constraints. According to Darch, Rapp and Underwood (1999) the constraints relate to connectivity, low budgets and a decline in the exchange rate of the South African currency.

2.4.3.2 Lesotho Library Consortium

The Lesotho Library Consortium is a collaborative initiative of some Lesotho libraries seeking to enhance resource sharing using ICT. It was founded in March 2003, with the assistance of the Open Society Initiative for Southern Africa (OSISA), which was cognisant of the need to enhance resource sharing among libraries in Lesotho. The purpose of this consortium is to provide information and documentation services among members by harnessing and sharing national and international resources through efficient utilisation of ICTs (Taole, 2004: 19). LELICO (LELICO, 2005) describes its objectives as follows:

- To develop and improve co-operation among member libraries;
- To serve as a co-ordination unit among member institutions, organisations and agencies, state and funding sources on those matters related to the improvement of services to members;
- To work towards a co-ordinated policy of technical information growth and development of efficient systems, rapid communication among the membership, shared resources, co-operative and co-ordinated purchasing, subscriptions and exploration of other areas of co-operation; and
- To co-operate with other libraries, research institutions and organisations within and without the country to further the purpose of the consortium.

Since its establishment, LELICO has negotiated free access to many journals. Members are already assisting their clients to access the most up-to-date information by using databases acquired through the consortium. To build capacity in the use of these modern

technologies, LELICO held a workshop in June 2004 the aim of which was to train members in the use of electronic databases and other digital information (Taole, 2004: 19).

Recognising both the inadequacy and lack of computers in some member libraries, LELICO managed to acquire 10 refurbished computers. This was achieved with the assistance of OSISA. Most of these computers are fully operational and have gone a long way towards assisting users of member libraries to access electronic information.

LELICO currently consists of libraries of the following institutions (LELICO, 2005):

- Agricultural Research;
- Palace of Justice;
- Institute of Development Management;
- Lesotho Agricultural College;
- Lesotho College of Education;
- Lesotho Highlands development Authority;
- Lesotho Institute of Public Administration and Management;
- Lesotho National Library Service;
- Lesotho Planned Parenthood Association;
- Lerotholi Polytechnic;
- National University of Lesotho; and
- Parliament of Lesotho.

LELICO has several types of member libraries; they include special libraries, a national library that also serves as a pubic library, and academic libraries, the majority of which are in the capital city, Maseru. The success of LELICO will depend on how effectively it uses ICTs to achieve its goals given the low levels of connectivity in Lesotho.

2.5 Success factors in the management of a library consortium

A library consortium involves bringing together a number of institutions with their own management styles, policies and priorities. It can therefore be quite challenging to manage a body composed of libraries from different institutions, however, there are factors that contribute towards the successful management of a library consortium. Allen and Hirshon (1998) and Woodsworth (1991) summarise these as follows:

- Governance;
- Technological infrastructure;
- Common purpose; and
- Funding.

2.5.1 Governance

A sound governance structure is essential for managing the short and long term activities of a consortium. Alemna and Antwi (2002:238) suggest that participating libraries should be bound by rules and regulations, and that they should enter into a formal signed agreement prior to joining a consortium. A central point should be identified to run the affairs of the organisation. They further suggest that the governing body be authorised to make and review the policies of a consortium. Towley (in Woodsworth: 52) contends that

the governance of the consortium should be viewed from a "communications" perspective, consisting of interrelated components of communications structure, resource flow and perceptions. The benefit of this perspective is its ability to respond to the communicated needs of members and to mobilize the necessary resources to meet these needs.

2.5.2 Technological infrastructure

Technology is central to the success of most consortia activities. De Gennaro (in Marais, 2003: 49) observes that a "lack of on-line capabilities has rendered previous networks ineffective". Technology in South African consortia receives a high priority, which is reflected in their mission statements. GAELIC and FRELICO have implemented a common library system (INNOPAC) in all member libraries; whilst the installation of Aleph 500 library system was one of CALICO's first projects (Darch, Rapp and Underwood, 1999: 29).

A sound technological infrastructure ensures that members have access to one another's' holdings. Inter-library lending works faster since one can verify the library that has the required material and effect the necessary transaction instantly and collection development can also be more effective (Marais, 2003: 29). Allen and Hirshon (1998, 42) suggest that, for the long-term sustainability of the consortium, management should direct and co-ordinate the adoption of emerging technologies in order to enhance member library services.

2.5.3 Common purpose

Another essential success element in the management of a consortium is a strong, shared recognition of the value of increased collaboration (Allen and Hirshon, 1998: 43). Despite differences in opinion, members should desire to work towards the common good of the consortium. Hewitt (in Marais 2003: 51) notes that collaborative efforts are more easily established when there is some parity and equality among members; varied membership might compromise individual institutions' goals. It is therefore important to have constant support from parent institutions.

2.5.4 Funding

Funding is crucial to the successful establishment and maintenance of a consortium. Woodsworth (1991: 63) observes that without external funding, co-operative efforts seldom flourish, but rely merely on the goodwill of members. Woodsworth strongly discourages the establishment of a consortium without reliable funding. In South Africa, GAELIC, FRELICO and CALICO were funded by the Andrew Mellon Foundation (Darch, Rapp and Underwood, 1999: 29; Edwards, 1999: 25). The Lesotho Library Consortium received seed money for its launch and establishment from the OSISA (Taole: 2004: 19). Woodsworth (1999: 125) suggests the following methods for income-generation among networks:

- Annual or flat fees;
- Transaction fees;
- Varying fees on the type of services used; and
- Permutations of the above.

Continued fundraising efforts by members will enable expansion of services and ensure the long-term sustainability of consortia.

2.6 Limitations and challenges facing library consortia

Despite the many successes achieved in resource sharing and particularly consortia development, there are limitations and challenges. Obstacles are more visible in developing countries. Woodsworth (1991: 131) mentions the following factors that prevent libraries from co-operating:

- High cost for minimal benefits;
- Savings and cost reduction are not affected;
- Co-operation is a marginal activity;
- Benefits are hard to explain;
- Satisfaction with the *status quo*;
- Confidential collections or proprietary information;
- The network, not its members, controls directions;
- Small libraries will be overwhelmed;
- Lack of creative and visionary leadership;
- Loss of autonomy;
- Conflicting policies;
- Lack of external funding;
- Local funds needed for local services; and
- Group fundraising competes with local efforts.

Although these limitations were identified in 1991, they remain valid. While some of the barriers might not be generalised for all regions, Gorman and Cullen (2000: 375) argue that there are four major barriers affecting co-operative efforts, namely:

- Desire for autonomy;
- Competitive environment;
- Changing institutional focus; and
- Financial constraints.

Odini (1991: 94) notes that, in developing countries, a lack of national policies on libraries has hampered resource sharing progress. This contributes to inadequate library budgets, which in turn results in poor library resources. Another factor is a lack of data on important library matters, for instance, it is impossible to exchange resources if there is no information on the holdings of other libraries. The rapid escalation in the price of materials, especially periodicals is another barrier. Given the fact that libraries in developing countries already operate on stringent budgets, the high price of library resources only exacerbates the problem. Another constraint is the lack of facilities for rapid communication among libraries. Resource sharing depends largely on a variety of facilities and equipment such as computers, telephones and facsimiles, which enable better communication. Without these facilities and equipment, the sharing of resources is problematic.

In addition to the above constraints, Mutula (2004: 281) adds that challenges applicable to Africa relate to:

- finances
- technology
- content, and
- information literacy

Notwithstanding these barriers, libraries have worked towards finding a common goal and increasing their effectiveness by sharing resources. The establishment of formal co-operative initiatives such as consortia is indicative of a desire among libraries to add value to and enhance service delivery to their users. The success factors in managing consortia seem to be the main drivers in ensuring their sustainability. It is necessary for library consortia to remain sensitive to the common purpose of all members, to ensure that the technological infrastructure necessary for service delivery is available, and to engage in fundraising.

2.7 Systems in libraries

A system can be defined as "an integral set of related components established to accomplish a certain task." (Capron in Osborne and Nakamura, 2000). In describing a system, Osborne and Nakamura (2000:3) highlight the following important elements:

- Interrelatedness of elements that perform some function;
- Logical boundaries define; and
- The elements involved must combine to meet some purpose.

In the case of library systems, the primary function would be to collect, process, store, and retrieve information to satisfy a variety of needs.

Over the years, libraries have introduced information and communication technologies, such as CD-ROMs (compact disc-read only memory), computer systems, videos, and the Internet in their operations to enable quick and effective ways of accessing data. According to Rowley (1993: 5), the use of information systems in libraries has been necessitated by:

- an increased workload;
- the need to achieve greater efficiency;
- the introduction of new services; and
- co-operation and centralisation.

Adams (1986) and Woodsworth and Wall (1991) note that academic libraries have been in the forefront of information system usage because of the pressure to provide good value for the money invested in them, which resulted in libraries having to address the needs of users faster and more effectively. In addition, increased enrolments in academic institutions increased the need for broader and improved access to information resources. Furthermore, the increased cost of printed journals persuaded librarians to examine alternatives such as electronic formats, which are cheaper when purchased through, for example, library consortia.

2.7.1 Library systems in consortia

Library systems have been a great motivation for establishing consortia around the world (Seal, 1991: 229). For example, DeGennaro (1991) notes that the “golden years of library

co-operation" in the USA were in the 1970s, when computing and telecommunication became strong. It was at this time that the USA experienced unprecedented growth in networks. Kopp (1998: 9) points out that one of the four general types of consortia was the "large consortia concerned with large-scale computerised processing". Similarly, in Britain, Moore and Carpenter (in Pilling and Kenna, 2002: 15) found out that 10 out of 11 consortia established since 1997 were concerned with technological applications and developments.

The implementation of library systems in developing countries was one of the main stimuli for establishing library consortia, and their use continues to provide a variety of opportunities for strengthening library services. The INDEST (Indian National Digital Library in Science and Technology) consortium in India offers "consortia-based subscription" to electronic resources to increase access and to cut the costs of journals (Gulati, 2004: 340).

South African library systems have been a priority in different library consortia. The implementation of Aleph 500 software as a common library system was one of the first projects of CALICO (Darch, Rapp and Underwood, 1999: 29). Similarly, FRELICO and GAELIC implemented the INNOPAC library system soon after their establishment (Edwards, 1999: 17).

The benefits of library systems in consortia are summarised by Frawley (2003: 100) in a discussion of the benefits of the ELP (Electronic Library Project) for Northern Ireland. They are:

- Reduction of costs;
- Improved library service performance;
- Wider public access to information;
- Business transformation;
- Equality of citizens participating in and developing technological skills; and
- Better value.

Library systems play a crucial role in enabling librarians to meet the needs of users. This role is strengthened through library consortia, as the benefits of resource sharing become more visible. The important role of library systems has motivated the implementation of systems such as the INNOPAC library system, which are increasingly being implemented in many parts of the world, through consortia and by individual libraries.

2.7.2 INNOPAC library system

The INNOPAC library system is a product of the Innovative Interfaces Incorporated (III) Company based in the USA, which was founded in 1978 (Ballard, 1995). Its origins are in the creation of the "black box" that was used as an interface between the OCLC (Online Computer Library Centre) and CLSI (CL System Inc.). This interface enabled libraries to download OCLC bibliographic records into the CLSI system. The first installation of the OCLC/CLSI interface occurred at the California State University.

Innovative Interfaces launched INNOVACQ in 1982. It offered advanced acquisitions and serials modules. This was followed by the introduction of the INNOPAC system in 1985, which supported cataloguing, circulations, serials, acquisitions and the online public access catalogue (III, 2005).

The III has introduced several enhancements since its establishment, which have made its products both responsive and relevant to the needs of libraries. The INN-Reach system was implemented in 1995, and supported about nine million records from 84 institutions. The Millennium Access Plus was launched in 2001. This product offered web-based information for different types of library functions (III, 2005).

The INNOPAC library system has continued to expand to many parts of the world. After 16 years of operation, it has been installed in 350 institutions worldwide, at a rate of nine or 10 new installations per month (Berry, 1994: 44). By 2004, around 1 100 systems had been installed serving over 1 400 academic libraries and more than 3 000 public libraries.

Although the majority of users of the system are in the developed world, the number of users in developing countries is increasing. For example, some libraries in the South American countries of Peru and Chile use the INNOPAC library system; Asian countries such China, Malaysia, Taiwan, Thailand, and Turkey have also installed the system in some of their libraries; whilst in Africa, the INNOPAC library system has been implemented in countries such as Egypt, Ghana, and Morocco, as well as some countries in the Southern African region.

2.7.3 INNOPAC library system in GAELIC and FRELICO

One of the main objectives of GAELIC is to utilise appropriate technology and to keep abreast of technological developments to enable more effective resource sharing among members. Therefore the implementation of a common library system became the first area of focus for GAELIC. After its establishment in 1996, GAELIC decided to build on UNISA's library system's specifications that had been drawn up the previous year. This was followed by a Request for Information (RFI) sent to four overseas and two local system vendors (Edwards, 1998: 18; 1999: 125).

After an evaluation and demonstrations of various systems, the INNOPAC library system was chosen as a common library system for GAELIC. A proposal for its implementation was immediately sent to the Andrew Mellon Foundation and a grant of $1.5-million was awarded for the first phase of the project. The System Implementation Management Committee implemented the INNOPAC library System in three phases:

Phase 1

Technikon Northern Gauteng

Technikon Pretoria

Technikon Southern Africa

Technikon Witwatersrand

University of South Africa

University of the Witwatersrand

Phase 2

Medical University of South Africa

Potchefstroom University for Christian Higher Education

Rand Afrikaans University

University of Pretoria

Vaal Triangle Technikon

Vista University

Technikon Free State

University of the Free State

Phase 3

Technikon North West

University of North West

University of Venda

University of the North.

Phases 2 and 3 were carried out with additional funds from the Mellon Foundation. The University of the Free State, and Technikon Free State of FRELICO also participated in Phase 2.

During data conversion, support was received from SABINET. The authority control process was out-sourced to Library Technologies Inc. of the USA Since most of the existing systems had to be converted from the SAMARC (South African Machine

Readable Cataloguing) to the USMARC (United Stated Machine Readable Cataloguing), intensive training was carried out on the USMARC before data conversion (Edwards, 1998 and 1999; Man and Erasmus, 1998).

FRELICO implemented the INNOPAC library system in 1999, in partnership with GAELIC. The funding for this process was provided by the Andrew Mellon Foundation. The Central University of Technology and the University of Free State have both migrated from their old systems to the INNOPAC library system (FRELIO, 2007).

Other South African institutions that were installing the INNOPAC library system in 2004 were the:

- Library of Parliament, Cape Town;
- Mangaung Library Service, Bloemfontein;
- Msunduzi Public Library, Pietermaritzburg; and
- National Film, Video and Sound Archives.

2.7.4 INNOPAC library system in some Southern African countries

In addition to the South African consortia and institutions mentioned in the previous section, the INNOPAC library system has proved to be a popular choice for other libraries in the Southern African region.

The Zimbabwe University Library Consortium has already installed the system in some of its member libraries. The University of Botswana Library changed from the British

system called TinLIB (The Information Navigator for LIBraries) to the INNOPAC library system, and has now installed its many modules. The University of Namibia began the process of implementing the system in its library (Erasmus, 2005).

As mentioned, the Lesotho Library Consortium may opt for the same system. In 2004, the National University of Lesotho, which is the largest member of LELICO, signed a contract with the system vendor, and it is now in the early stages of implementation. This might affect LELICO's choice of its common library system.

Generally, there has been an increase in the adoption of the INNOPAC library system in South Africa, especially by academic libraries, with most of the libraries implementing the system through consortia. Examples of these are GAELIC, FRELICO and SEALS. Similarly, other libraries like BCA, NUST, UB and UNAM in the Southern African region are using the system. The increasing interest in the INNOPAC library system in the Southern African region therefore calls for a thorough evaluation of the performance of the system and whether or not it meets the needs of the libraries. Since other libraries in the region are interested in implementing the system, it is necessary to assess its performance and question its application in environments with more specific requirements.

2.8 Evaluation of library systems

Hernon and McClure (1990: 1) define evaluation as: "the process of identifying and collecting data about specific services or activities, establishing criteria by which success can be assessed, and determining both the quality of the service and the degree to which the service accomplishes stated goals and objectives." The process of evaluation involves a comparison of performance and the stated objectives of the service. This is done to determine (a) if there has been any change in performance for a given period, and (b) if so, if the change has been in the desired direction, and to what extent (Goldhor in Lancaster, 1977: vii). According to Swanson and Meyer (1975: 56) evaluation is seen as a decision-making tool, whose purpose is to:

- assess a programmes' objectives or goals;
- determine if and how well objectives of performance expectations are being met;
- determine reasons for specific successes and failures;
- discover the principles underlying a successful programme;
- examine the alternatives and techniques for increasing programme effectiveness; and
- re-assess programme objectives and programme design implementation.

While there are various factors that have contributed to the success or failure of library systems, Farajpahlou (1999) contends that they can be summarised as two aspects: technical and human. On the technical side, functionality is a vital criterion as it relates to inherent characteristics of the system. Joint (2006) gives two views of functionality, which he describes it as 'objective' and 'subjective'. Objective functionality is defined as "a set of properties residing inherently in the technology under consideration", while

subjective functionality is about what a product can do for the user. Properties that describe objective functionality of a library system include availability, accessibility, reliability, security, ability to integrate, ability to customise and upgradeability.

The human side, which is also referred to as 'subjective functionality' by Joint (2006), refers to aspects of usability of the system, support, training, and relations with the system vendor. This criterion looks at appropriate features that assist a user to navigate the system. It is considered crucial as the success of the system lies in its effective use and how it is perceived by users. It covers aspects such as user-friendliness, error and help messages, support systems, training, and availability and helpfulness of the vendor.

2.8.1 The importance of evaluating library systems

Library systems play an important role in libraries, especially in cases where libraries have come together in establishments such as consortia, and where a number of institutions are affected. The evaluation of library systems as the backbones of libraries and library consortia is necessary. Osborne and Nakamura (2000: 7) list a number of reasons for system evaluation:

- *Implementation of a new technique* – In this case, there would be a need for staff members to keep abreast of new developments, emerging trends and evolving technology;
- *External environmental changes* – New requirements or regulations outside the system may necessitate changes;
- *Interest in improving the current system;* and

- *Problems with a system* – general dissatisfaction among staff and end-users, or a crisis situation creating a demand for evaluation.

Systems play a crucial role by facilitating exchange and sharing information in library consortia. Thus most library consortia give priority to the implementation of a common library system, as this enables them to be more efficient. There is a mutually beneficial relationship between library consortia and systems. While library systems enable the smooth running of a library consortia's business, the emergence of library consortia has had an impact on new developments in library systems. For example, Frasciello and Richardson (1999: 77) point out that, "library consortia became a driving force behind the true client/server- based distributed systems". The client/server systems addressed complex issues related to resource availability and sharing related to library consortia. Consortia require systems that address their specific needs, such as those related to interoperability, manageability, and security (Frasciello and Richardson, 1999: 80).

2.8.2 Evaluative studies of the INNOPAC library system

The following three evaluative studies on the INNOPAC library system show how the system's performance:

2.8.2.1 Functional Performance of Automated Systems: a Comparative Study of HORIZON, INNOPAC, and VTLS (Chaudhry and Ashoor, 1998)

The study aimed to examine the functional performance of three major library systems: HORIZON, INNOPAC and VTLS. This was achieved through input from system

vendors, as well as 152 libraries from 15 countries in different parts of the world. Respondents included academic, national, public and special libraries. The major functional areas assessed were:

- Acquisitions;
- Cataloguing;
- Circulations;
- Public Access Catalogue;
- Reference and Information Services; and
- Serial Control.

The study found that the availability and use of features of the INNOPAC supported 96% of the listed features, HORIZON supported 94% and VTLS supported 87%. Functionality analysis indicated that 23% of INNOPAC library system users were using all the system modules, while none of HORIZON and VTLS users were using all the modules. The performance in operational setting of INNOPAC was reported to have greater potential for automating Circulations, Acquisition, Serial Control, Cataloguing, and, Reference and Information Services. But it scored low on prompts and help messages in the Public Access Catalogue.

The overall assessment revealed that the automated library systems had not been exploited to their full potential, and only limited functions were being fully utilised. It was recommended that further investigation be carried out to determine the reasons for the under-utilisation of the system's capabilities.

2.8.2.2 A Library's Integrated Online Library System: an Assessment and Hardware Implementation (2004)

This study was conducted among members of a consortium of academic libraries in southern Nevada in the USA (Vaughan, 2004). The consortium used INNOPAC as its common library system. The objectives of the study were to:

- Understand the relative place of Innovative Interface Inc. in the library automated-system vendor marketplace in 2001;
- Agree on prioritised and weighted-performance criteria using broad staff input;
- Measure and evaluate the performance of the shared system against the criteria using broad staff input; and
- Recommend one of the following courses of action:
    - Re-affirm the consortium's commitment to Innovative as the vendor of choice with recommendations to upgrade and expand the existing system as appropriate; or
    - Begin a formal review of the vendor market-place to select a new vendor to replace Innovative.

For the purpose of this study, only findings relating to the measurement and evaluation of the performance of the INNOPAC library system will be discussed. These are summarised in the table 5:

Table 5 Findings of the Nevada Study on the INNOPAC library system

Reliability and performance	Outstanding
User interface andand functionality	Comprehensive, but some inflexibility noted in Public Access Catalogue
Staff functionality andand interface	Good
Vendor support	Satisfactory

Because the general good performance of the INNOPAC library system, the consortium decided to re-affirm its commitment to Innovative as the vendor of choice with recommendations to upgrade and expand the existing system.

2.8.2.3 A Survey of GAELIC members on Innovative Interface Inc. as company and INNOPAC as a library system (2004)

This study was carried out in 2003 – five years after the first phase of INNOPAC library system was implemented in GAELIC. All 16 participating institutions were surveyed. The aim of the study was to review the experiences of GAELIC libraries regarding the III (vendor) and its products and services, mainly the INNOPAC library system (GAELIC, 2004).

The focus areas were related to:

- costs;
- customisation;
- developments;
- support services;

- training;
- dcumentation;
- communication;
- user groups and GAELIC INNOPAC System Workgroup;
- libraries' expectations of the library system;
- role of the system in the libraries' service strategies and processes;
- optimal use of the system; and
- other issues to be raised with III and GAELIC.

Findings

Costs

The majority of libraries (64%) believed that the annual maintenance fee was high, especially as the exchange rate disadvantaged South African libraries. When it came to costs relating to staff expertise and time, the majority of libraries (62.5%) needed at least one dedicated staff member to perform regular system administration support tasks. There were also additional products that 56% of the libraries had to purchase to enhance the functionality of the system.

Functionality

Most libraries (81%) rated the functionality of the features of the library system in terms of internal processes and end-users services as high. There were positive comments about the user-friendliness and comprehensiveness of the system. Areas of concern were the Circulation and Acquisitions modules.

Customisation

Half of the libraries rated the ability to customise the system as good, while the other half rated it as average.

Developments

In terms of accommodation of user requirements and new technology, the majority of libraries (77%) were experiencing on-going developments. This was evident enhancements such as Web-based modules, interlinking with commercial information providers and databases, e-commerce, and wireless public access catalogues. The frequency of maintenance up-dates and releases was rated as good.

Support services

Support services were rated as good by the majority (75%) of libraries.

Training

Forty-four per cent rated the training provided by III during implementation of INNOPAC as good and 44% rated it as average.

Documentation

The documentation of the system was favourably rated by 76% of the respondents, who said it was up-to-date, comprehensive and helpful. They indicated that the training documentation could be improved.

Communication

Communication was said to be regular and relevant.

User groups and the GAELIC INNOPAC System Workgroup

The user groups referred to here were the International Innovative User Group and listserv, and the Innovative User group – Southern Africa. These were said to be beneficial and offered good support to members. The GAELIC INNOPAC System Workgroup was seen as a platform where members learned from each other, addressed their training needs and negotiated for discounts on new products and system enhancements.

Libraries' expectations of the library system

The system met most of the libraries' expectations and requirements in terms of functionality. It was described as stable, forward-looking and responsive.

Role of the library system in the libraries' service strategies and processes

A positive role played by the system was noted by most libraries (94%) in the service delivery and enabling libraries to address clients' needs.

Optimal use of the system

Many libraries (63%) do not use the available functionality of the system optimally.

Benefits and value of the library system outweighing its initial and ongoing costs

The majority (63%) of libraries stated that the benefits and the value of the system outweighed its initial and on-going costs.

Issues to be raised with III and GAELIC

Issues of concern that could enable smoother running of the systems were:

- A need for a South African Innovative office;
- Customisation to a South African environment, e.g. less American terminology;
- New system enhancements were considered to be added too quickly for libraries to keep pace; and
- Lack of Web design knowledge among GAELIC libraries, hampering their ability to customise the system Web interface.

Generally, the system was rated positively by GAELIC members with regards to meeting most needs of member libraries. The majority of libraries were satisfied with its performance. A regular assessment would assist in ascertaining whether or not the system still performs as expected, and ensure that it responds to the changing needs of the consortium.

2.8.2.4 GAELIC Institutional Members Survey (2005)

Another relevant study entitled "GAELIC Institutional Members Survey" was carried out in 2005. The study looked at various aspects of GAELIC membership such as library facilities, collections, expenditures and the INNOPAC library system infrastructure.

Among others, it reviewed mission statements of GAELIC member libraries against their parent institutions and GAELIC developments. The study found that most members' mission statements were aligned with their parent bodies. It also examined membership and participation in the consortium, specifically looking at the strengths and weaknesses of GAELIC from the members' viewpoint, resource sharing, common system support and collaboration were among the highlighted strengths of GAELIC, while the distance between institutions, too many meetings and teams were among its weaknesses.

The study established that there was general satisfaction on the performance of the system in GAELIC member institutions. It recommended that an evaluation of the system be done "to find out if it is still the best choice for the enlarged GAELIC and for instituting a rolling review of the vendors as new products become available" (Smith and Underwood, 2005: 38).

In addition to the functionality for bibliographic processing on which the GAELIC Institutional Members Survey focused, the researcher of the current study will also examine aspects such as usability, availability, and the use of online support groups, like the Innovative User Group and the INNOPAC User Group: Southern Africa. Another South African consortium, FRELICO and three other libraries in the Southern African region that use the INNOPAC library system will be evaluated.

2.9 Conclusion

The literature has pointed to various collaborative activities among libraries in both developed and developing countries. Reasons for these activities and the establishment of library consortia in particular include a need to share resources and to reduce costs. The principal aim of the establishment of library consortia is to address the needs of information users more effectively and efficiently. The literature also highlights a growing number of library consortia across the world.

The factors related to the successful management of library consortia are: governance, technological infrastructure, common purpose and funding. However, limitations have been identified that hinder co-operation in library consortia. These are: desire for autonomy, competitive environment, changing institutional focus, and financial constraints. Challenges that apply to African consortia are related to finances, technology, content and information literacy.

The role of library systems in library consortia and their evaluation as a crucial management element are clearly important. The INNOPAC library system is preferred in a number of library consortia in the Southern African region. Some studies have attempted to evaluate this system to improve it. The most relevant studies are those of GAELIC which was conducted in 2003, which sought to review the experiences of GAELIC members in respect of the system's vendor and the system itself, and "The GAELIC Institutional Members Survey, 2005" which looked at aspects of GAELIC membership and included the INNOPAC library system.

The literature review has exposed several aspects of the implementation, management and value of the INNOPAC library system in library consortia. However, with reference to the questions posed in the study, the literature did not however deal with the following questions:

- What is the value of INNOPAC for small multi-type consortia in a developing country like Lesotho?
- What are the impact and benefits of the INNOPAC library system in the developing world?
- Which success factors and limitations are relevant to the implementation and management of the INNOPAC library system for LELICO?

The chapter identified the following criteria for a comprehensive evaluation of the INNOPAC library system:

- Functionality;
- Usability;
- Costs;
- Support;
- Training; and
- Vendor.

Management of the server is considered to be an important additional aspect that should be examined for a small multi-type consortium like LELICO. Chapter three describes the

research methodology, including target groups to be assessed, sampling techniques and data collection methods. It will also discuss the data analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction:

This chapter discusses the collection of data to answer the principal and subsidiary research questions of the study (see section 1.2). It explains the research design, sampling techniques and data collection methods used. In addition, it describes the analysis of the data. As a means of ensuring data quality, the chapter also outlines ways of addressing threats to reliability and validity.

Collected information should seek to answer the principal question of the study, which is: What have been the successes and limitations of the INNOPAC library system for selected consortia and libraries in the Southern African region, and how can these guide the implementation of this system in the Lesotho Library Consortium? As shown in the previous chapter, some evaluative studies were conducted on the system, however, a number of gaps were confirmed in the literature regarding a fuller evaluation of the INNOPAC library system in consortia and libraries in the Southern African region, especially from the perspective of smaller, multi-type consortia.

3.2 General perspective

This evaluation study is summative in nature; which is described by McClure (1982: 23) as an outcome evaluation that takes place at the end of an operation and it is product, rather than process oriented. Summative evaluation shows the success of the programme

in achieving a set of organisational goals, and is thus concerned with the effects of the programme. Usually two approaches are used in this type of evaluation, namely:

- The collection of information necessary for decision-making, usually conducted during the monitoring stage. The information gathered is then compared with the pre-determined measures already established for the programmes' success;
- The results or output of the programme are compared to organisational goals to show the effectiveness of the programme.

Summative evaluation differs from formative evaluation in that the latter produces information that is fed back during the development of a programme to help to improve it. This is usually undertaken during the implementation stages of a programme.

This summative evaluation of the INNOPAC library system will be checked against LELICO requirements to identify discrepancies and lessons for implementation and management.

Although both quantitative and qualitative measures are employed, the study will primarily apply a qualitative approach. According to Glazier and Powell (1992: xi), qualitative methods focus on the experiences of people involved and try to understand the reasons behind certain behaviours. The strength of qualitative data is its rich description. According to Miles and Hubermann (1994), it involves the following characteristics:

- It is conducted through intense contact within a 'field' or real-life setting;
- The researcher's role is to gain a 'holistic' or integrated overview of the study, including the perceptions of participants;

- Themes that emerge from the data are often reviewed with informants for verification;
- The main focus of research is to understand the ways in which people act and to account for actions;
- Qualitative data are open to multiple interpretations.

On the other hand, quantitative measures are about "the study of 'things' by the use of mathematical and statistical methods" (Booth, 1988: 48). Both quantitative and qualitative will be used in this study. The questionnaires will mainly seek to collect quantitative data, while interviews and observation will gather data of a qualitative nature. It is envisaged that the two will complement each other, as the qualitative method will give insight to the quantitative method, thereby enriching the quality of data collected.

3.3 Research design

A research design is described as: "a plan that guides the investigator in the process of collecting, analyzing and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning causal relations among the variables under investigation" (Yin, 1994: 19). The design covers sampling techniques as well as the data collection methods to be used.

The study employs a case-study design, the case being the INNOPAC library system in GAELIC and FRELICO and selected libraries in the Southern African region. Yin (1994: 13) defines a case study as an empirical inquiry that:

- investigates a contemporary phenomenon within real-life context; and
- uses multiple sources of evidence.

'Library consortia' are a relatively new phenomenon in the Southern African region and influence the operations of libraries and their parent organisations. Library systems play a significant role in the operations of consortia and are therefore worth investigating.

The advantage of a case study method is that it is not just descriptive, it also tries to attribute causal relationships (Gray, 2004: 124). The value of this method in the current study is that it forms a basis on which comparisons can be made. Investigating GAELIC and FRELICO enables the researcher to understand the context within which the INNOPAC library system operates in these consortia. This results in further investigation of the extent to which the GAELIC and FRELICO cases can be generalised for consortia in other developing countries like LELICO. The other libraries selected from the Southern African region provide additional information on how the INNOPAC library system is performing in small developing countries.

3.4 Target groups

The following are the target groups for this study:

- Library staff of five GAELIC libraries and two FRELICO libraries;

- System librarians of five GAELIC libraries, two FRELICO libraries and three libraries in the Southern African region;
- Library management of five GAELIC libraries and two FRELICO libraries;
- Project manager of SEALS; and
- Twelve library heads of LELICO member libraries.

3.4.1 Library staff of GAELIC and FRELICO

The GAELIC and FRELICO consortia were chosen because they were among the first consortia in the Southern African region to implement the INNOPAC library system. Their relatively long experience with the system makes them ideal candidates for the study. As close neighbours of Lesotho's, they can provide valuable lessons for the implementation and management of the INNOPAC library system.

Library professionals use different modules of the system on a day-to day basis. These people were chosen to provide information of the performance of these modules and to give their impressions on the overall performance of the system.

3.4.2 System librarians of five GAELIC libraries, two FRELICO libraries and three libraries in the Southern African region

System librarians provide technical support to staff, as well as the end-users of the system. They should to be conversant with all the modules to effectively provide assistance. This group was chosen to provide information on the system's performance, the benefits derived from using the system and on the ways in which they used the

support system provided by the vendor. In addition, system librarians were asked to comment on pitfalls to look out for during the implementation of the INNOPAC library system.

In addition to GAELIC and FRELICO's system librarians, BCA, NUST and UNAM's system librarians were purposely selected to provide the information described above. The libraries chosen are located in Botswana, Namibia and Zimbabwe and were used because they are in the Southern African region, and are similar to Lesotho libraries in terms of size, budget and types of clientele served. They were among the first to implement the INNOPAC library system. They can provide valuable insight into the general performance of the system and highlight problems and resolutions. System librarians are responsible for the overall management of a system and are considered the best candidates to provide information on the overall performance of the INNOPAC library system.

3.4.3 Library management of GAELIC and FRELICO

GAELIC and FRELICO management (university librarians/directors) was considered to be appropriate potential sources of information on cost, benefits, success factors and pitfalls to observe when implementing the system. As they have been involved since the inception of the consortia and provided guidance in the choice of a common library system, they are well positioned to answer key questions.

3.4.4 SEALS project manager

SEALS project manager was chosen to provide information on how the INNOPAC library system is performing in SEALS, which uses a central model for the management of its server. This model is different from a decentralised one used by both GAELIC and FRELICO. Through information gathered from the SEALS project manager, comparisons were made between central and decentralised models and informed recommendations were made on the best model for LELICO.

3.4.5 LELICO library heads

LELICO library heads were chosen to be the primary informants in this study because they have been in the forefront of the establishment of the consortium. Furthermore, they are in a position describe their expectations and requirements of a common library system. They also have a better understanding of the impact of the purchase of a system on their library budgets.

3.5 Sampling techniques

3.5.1 GAELIC

GAELIC comprises 16 academic libraries that are now merged into nine institutions. Five of these libraries and campuses form part of this study as they are considered to be a fair representation of GAELIC. They reside in the following institutions:

- Tshwane University of Technology (main campus);
- University of Limpopo (Medunsa campus);
- University of South Africa (main campus);

- University of the Witwatersrand; and
- Vaal University of Technology.

Library managers, system managers and representatives of all library sections (Acquisitions, Cataloguing, Circulations, OPAC and Serials) were represented. Three system librarians of these institutions were interviewed in an effort to gather additional information.

3.5.2 FRELICO

Five of FRELICO's libraries have now merged into two, while the other three have withdrawn membership (see section 2.4.3.1.3). The sample comprises libraries of the following institutions:

- Central University of Technology (main campus); and
- University of the Free State (main campus).

Only main campuses of these libraries form part of this study as they were the first to implement the system. Library managers, system librarians and Librarians of these campuses were considered to be the most knowledgeable to comment about the system. Librarians will be selected from each section of the library to ensure that users of each module are represented.

3.5.3 LELICO

Data will be collected from all 12 library heads of the Lesotho Library Consortium to ascertain their system requirements, their expectations, as well as their current budgets. Five of the library heads will be interviewed, namely, heads of the following institutions:

- Lesotho College of Education (LCE);
- Lesotho National Library Services (LNLS);
- Lerotholi Polytechnic (LP);
- Palace of Justice (PJ); and
- National University of Lesotho (NUL).

Three of these (LCE, LP and NUL) are the biggest and the oldest academic libraries in Lesotho. LNLS is a national library, which serves as the biggest public library in the country. PJ was selected to represent small special libraries, which form the majority of LELICO membership.

3.5.4 Other Southern African libraries

Three other libraries in the Southern African region using the INNOPAC library system were asked to comment about their experiences. These libraries belong to the following institutions:

- Botswana College of Agriculture,
- National University of Science and Technology; and
- University of Namibia.

3.6 Data collection methods

A multi-strategy approach called 'triangulation' was used to collect data. Triangulation is defined as "the use of more than one method or source of data in the study of a social phenomenon so that findings may be cross-checked" (Bryman, 2001: 509). Glazier and

Powell (1992: 6) recommend this approach as it tends to reflect and explain issues more accurately than any single measure. Furthermore, triangulation allows a researcher to have greater confidence in the research findings than if a single method was used (Clarke and Dawson, 1999: 88). The methods applied in this study to achieve triangulation are discussed below.

3.6.1 Questionnaires

A questionnaire is defined as a data collection technique through which people are asked to respond to the same set of questions in a pre-determined order (Gray, 2004: 187). Besides the advantage of allowing for wide coverage, questionnaires save a lot of time and effort since a single set of questions is duplicated and sent to many respondents. According to Gray (2004: 187), and Bryman (2001: 127), questionnaires are less costly and allow respondents to complete them at a time and place that suits them, thereby limiting any interference and bias that could be caused by the presence of the researcher.

Several disadvantages are associated with this data collection technique. Bennett (2003: 59), Bryman (2001: 127), and Gray (2004: 187) contend that the drawbacks of a questionnaire are:

- low response rate;
- difficulty in probing respondents since personal contact is lost;
- no allowance for respondents to ask questions should clarity be needed; and
- greater risk of missing data.

Some of the drawbacks raised above are addressed in this study by making questions as clear and unambiguous as possible. The questionnaires were preceded by a short explanation of the aims and objectives of the research. This gave respondents an insight into the study and elicited relevant and useful data. The questionnaires were as brief as possible so that respondents did not lose interest and thus fail to answer questions. The questionnaires also provided space for comments and suggestions for respondents to provide additional information.

A set of five questionnaires were prepared and administered to:

- GAELIC and FRELICO library heads;
- GAELIC and FRELICO systems managers;
- GAELIC librarians who use different library modules;
- LELICO library heads; and
- Systems managers in three institutions from other Southern African countries using the INNOPAC library system.

All questionnaires were pre-tested to ensure that they captured the requisite information. It was envisaged that there would be issues that require clarification during the pre-testing. The instruments were then adjusted accordingly to accommodate the necessary changes. The importance of pre-testing data collection instruments is highlighted by Bryman (2001) who contends that pre-testing may:

- help identify questions that make respondents uncomfortable;
- help identify questions that are not well understood;

- determine adequacy of instructions; and
- determine the flow of questions.

Finally, the questionnaires were submitted to the UP Ethics Committee for approval.

The questionnaires are attached as Appendices 2 – 6

3.6.2 Interviews

Interviewing is a data collection method defined by Dexter (in Clarke and Dawson: 72) as "a conversation with a purpose". Gray (2004) describes interviewing as "a conversation between people in which one person has the role of a researcher". Interviews can be used for both qualitative and quantitative research. Freebody (2003:133) divides the interview into three categories, namely, structured or fixed response, semi-structured and open-ended interviews. A structured interview tends to follow a fixed and standardised pattern. All the respondents are asked exactly the same questions and are often asked in the same order. This method of data collection tends to reduce error caused by interviewer variability. The semi-structured interview follows a pre-determined set of questions, but allows an interviewee to discuss aspects of the topic that are relevant to the interview. The open-ended interview follows a pre-determined format and the questions are open-ended.

Interviews are powerful data collection tools. They provide rich data and insights into the research, since they enable an interviewer to assess a situation and act accordingly (Bennett, 2003: 58). The point is summarised by Adams and Schvaneveldt (1985: 214) as follows: "the interviewer can 'read' people, assess their mood, probe, clarify, and seek

additional information in a variety of ways." Probing allows for more specific answers; questions can be repeated in instances where there are misunderstandings; and validity of data can be ascertained through non-verbal behaviour.

However, interviews tend to be expensive and time-consuming. In a large project, the staff needed for this kind of data collection technique includes administrators, field supervisors, and interviewers. A substantial amount of time and money is needed for activities such as preparation, preliminary visits and the interview itself. Interviews can also generate a lot of data that can be cumbersome and difficult to analyse (Bennett: 2003: 58).

From this study, the researcher used a semi-structured interview. Although it followed a formal interview guide, it gave respondents an opportunity to discuss issues that they believe to be relevant. The researcher believes that these interviews gathered information that could perhaps not be obtained through questionnaires, thereby strengthening the usefulness, reliability and validity of data. Interviewees included:

- Selected GAELIC and FRELICO systems managers;
- One system manager from the three selected libraries; and
- The project manager of SEALS.

Selected GAELIC and FRELICO system librarians were interviewed for additional information, explanations and clarification that emanated from questionnaires. Other informants were selected library heads from the LELICO libraries. In addition,

neighbouring Southern African countries that have implemented the INNOPAC library system were be interviewed on their experiences, as well as the general value of the system to their libraries, consortia and countries.

The researcher captured data on a tape recorder and with written notes. The interview schedules are attached as Appendices 8 and 9.

3.6.3 Observation (site visits)

Observation is another data collection technique used in this study. Busha and Harter (1980: 147) describe 'observation' as the object or subject under study is who subjected to close – usually visual – surveillance. According to Bryman (2001: 163), the five major types of observation research are:

- **Structured or systematic observation** – a technique in which a researcher employs explicitly formulated rules for the observation and recording of behaviour;
- **Participant observation** – which entails prolonged immersion of an observer in a social setting in which he or she seeks to observe the behaviour of members of that setting and to elicit the meanings they attribute to their environment and behaviour;
- **Non-participant behaviour** – an observer observes but does not participate in what is going on;

- **Unstructured observation** – does not use any observation schedule, as is the case with structured observation, but it aims at recording as much information as possible to develop a narrative account of the object being observed;
- **Simple observation** – an observer is unobtrusive and is not seen by those being observed. The observer therefore has no influence over the situation being observed.

The advantage of observation as a data collection technique is that it provides a picture of the context in which something takes place (Bennett, 2003: 59). Bias caused by social interaction is to a great extent eliminated in this method. As Bailey (1978: 249) points out, "a researcher asking the respondent about his or her own behaviour will encounter all sorts of difficulties, including deliberate denial of certain behaviours or memory failure. But with this method, an observer can watch the situation and get a true picture of what is happening". Another advantage of the observation technique is that it can yield information on aspects of which participants are unaware. On the other hand, observation requires time for data collection and analysis (Bennett 2003: 59). Data collected in this way is often difficult to quantify and categorise systematically. This may make it difficult for a researcher to reach any conclusions.

The study followed a structured observation technique, and an observation schedule. Specified categories of points were used. An explanation on observed information was allocated to those categories. The objectives of the observation or site visits were to examine the operations of the INNOPAC library system. This involved aspects such as

which modules are installed, and which are not yet installed, the security features of the system, as well as the accessibility and availability of any supportive material such as manuals. The visits were expected to shed light on the system's performance. The following sites from FRELICO were visited:

- Central University of Technology (main campus); and
- University of the Free State (main campus).

From GAELIC, libraries of the following institutions were visited:

- Tshwane University of Technology (Pretoria campus);
- University of the Witwatersrand (main campus); and
- University of South Africa (main campuses).

These are among the biggest libraries in both FRELICO and GAELIC. They were also among the first to implement the INNOPAC library system and are considered to offer a fair representation of their consortia.

The observation schedule is detailed in Appendix 7.

3.6.4 Document analysis

In-house documents offer a wide range of information. They can, for example, appear in the form of personal documents, official documents, mass media outputs and virtual outputs, such as the Internet (Bryman, 2001: 369). Documents are important sources of information when one is looking for information such as goals and objectives of the institutions/organisations under study. Adeogun's study has shown that documents can

reveal internal problems and aspirations of the library as an organisation (Adeogun, 2004: 75).

This study undertook a thorough analysis of documents generated by and about all the stakeholders of the research topic in the form of reports and minutes of meetings, brochures, and publications. Documents were collected from GAELIC, FRELICO, LELICO, Southern African countries, Innovative Interface (vendor) and websites. Information obtained from websites and reports of consortia under study were used to guide the construction of questionnaires and to assist in the site visits.

The GAELIC and FRELICO annual reports provided historical information on the implementation of the system, when and how decisions were made, as well as the overall performance of the system within these consortia. LELICO reports shed light on matters relating to the direction the consortium is taking with regard to the common library system as a tool for its co-operative measures. Documents emanating from other Southern African countries were used to gather information on the INNOPAC library system's performance. Publications on the INNOPAC library system and the Innovative (vendor) gave insight into the system's performance in other countries and into strategies that the vendor has in place to strengthen the relationship with its customer base. This included future plans, growth pattern in developing countries and future plans for the system.

3.7 Issues relating to data quality

Reliability and validity were mentioned as the two main criteria for determining data quality (Bryman, 2001; Gray, 2004; Hernon and McClure, 1990; Yin: 1994). The two concepts are related in that validity presumes reliability – a measure is not reliable, it cannot be valid (Bryman, 2001: 74).

3.7.1 Reliability

Bryman (2001) and Gray (2004) agree that reliability is a measure of a research instrument's consistency. Good reliability of an instrument would mean that one would get the same result when measuring something at different times. In other words, if one follows the same procedure for measurement, then one would get the same result. Gray (2004) argues that reliability can be increased by confirming and comparing results with those obtained from other sources. The three factors that determine reliability are:

- **Stability** – This involves steadiness or constancy. An instrument is said to be stable if it is administered to a group and then re-administered and there is a little difference over time.
- **Internal reliability** – Here one looks at whether or not the indicators that make up the scale are consistent. This would be applicable where a multiple-item measure is used and the respondent's answers to each question are combined to form an overall score.
- **Inter-observer consistency** – This refers to uniformity of results where subjective judgement is involved. For example, in content analysis where researchers would have to decide on ways to categorise items.

3.7.2 Validity

Gray (2004: 219) contends that an instrument is valid if it measures what it was intended to measure. He adds that an instrument should cover all research issues both in terms of content and detail. Validity is broken down into three categories by Yin (1994: 33), namely:

- **Construct validity** examines correct operational measures for the concept under study. For the case study design, Yin (1994: 34) suggests that a researcher uses multiple sources of evidence, establishes a chain of evidence and has key informants review the final draft report.
- **Internal validity** establishes whether or not certain conditions lead to other conditions. Pattern-making, explanation-building and time series analysis are suggested by Yin (1994: 34) as tactics to increase internal validity.
- **External validity** establishes whether or not research findings can be generalised. According to Yin (1994: 36), replicating the study is a way of finding out if the same results would be obtained.

In this study, the researcher ensured data quality by addressing both reliability and validity. The following steps were taken:

- Triangulation was used as a multi-method approach to provide greater confidence in the findings as it combines the strengths of different data collection methods (Clarke and Dawson, 1999: 88).

- The research instruments were pre-tested using a sample of respondents to ensure that they cover the research questions in terms of content and detail (Bryman: 2001: 155).
- The questionnaires were concise and clear to increase response rate and to avoid ambiguity. Furthermore, a brief note on the aims of the research was provided to give respondents the context of the research. This positively influenced both the relevance and usefulness of the information collected.
- Respondents were not asked to provide their names so as to encourage freedom of expression and to allow a true picture of the situation.
- Key informants were interviewed to gain more information, which was not obtainable from the questionnaires alone. Interviewees were probed to give more specific answers and asked to elaborate on salient issues.

3.8 Data analysis and interpretation

Data analysis involves a process of thorough examination and interpretation. Dey (1993: 30) describes data analysis as "the process of resolving data into its constituent components, to reveal its characteristic elements and structure". It is through analysing and interpreting data that one can make sense of the information collected. This study collected quantitative and qualitative data. Data will be analysed according to its type. Data analysis is dealt with in Chapter 4.

3.8.1 Analysis of quantitative data

Quantitative data was mainly generated from questionnaires administered to different respondents as discussed in section 3.6.1. The researcher used computer software called the Statistical Package for Social Scientists (SPSS) to capture and analyse the quantitative data. This software allowed the researcher to define variables and enter data. It then generates useful statistical components of recorded information such as bar-charts, pie-charts, frequency tables and histograms. It also calculates statistical tendencies (mean, median and mode) and dispersion (range and standard deviation) (Bryman, 2001)

3.8.2 Analysis of qualitative data

Qualitative data was generated mainly by interviews and observations made during site visits. The researcher used Dey's model of qualitative data analysis, which describes qualitative data analysis as, "the related process of describing, classifying and connecting data" (Dey, 1993: 30). The three elements are described as follows:

- Description involves a thorough narration of the phenomenon under study, including context of action, intentions of the actor and the process in which the action is done;
- Classification looks at the sorting of data according to its different elements; and
- Connection examines patterns in data and looks for singularities, regularities and variations.

Another step in the data analysis process is the interpretation of data, which is discussed fully in Chapter 5. Interpretation of data seeks to explain findings, answers 'why'

questions, attaches significance to particular results and describes patterns (Patton, 2002: 373).

3.9 Conclusion

This chapter described the methodology used to seek answers to the research questions posed in Chapter 1. It enumerated the research design, sampling techniques and the data collection techniques used. The chapter also discussed issues pertaining to reliability and validity, which affect data quality. It concluded by showing how the quantitative and qualitative data generated in this research was analysed. Chapter 4 deals with the presentation of the data.