Cape Peninsula University of Technology

MANAGING ELECTRONIC RESOURCES AT SELECTED TERTIARY INSTITUTIONS IN THE WESTERN CAPE, SOUTH AFRICA

by

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DECLARATION

I, Regina Balengane Sikhosana, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

The aim of this research study is to explore the management of electronic resources used in libraries. Three tertiary institutions were used as case studies. The unit of analysis was the three libraries, with library employees (14) working and managing electronic resources being the unit of observation. Non-random, purposive sampling techniques were used. The finding of this study suggests that the participants do not use the Aleph integrated library system (ILS) optimally to manage electronic resources. Library employees do not keep up with current and new emerging technology trends in the library and academic environment. There is a lack of training, as well as understanding, of business processes and workflows. This is emphasised by a lack of knowledge of library system environments and, finally, the high cost of implementing the library systems.

Electronic resource management (ERM) systems emerged in the early 2000s, and it became clear that traditional integrated library systems did not have sufficient capacity to provide efficient processing for meeting the changing needs and challenges of libraries at tertiary institutions. Libraries find it challenging to manage the wide range of licensed electronic resources, collaborating, cooperating and sharing resources with different libraries. The increasing number of electronic resource demands from users for remote or off campus access makes it difficult for libraries to manage electronic resources. As a result of this inability to manage the electronic resources, libraries are not effectively and efficiently using appropriate electronic resource systems to meet their business requirements.

Keywords: Academic libraries, academic library profession, business processes, collection development, collection development policy, digital resources, electronic resources, electronic resource management, electronic resource management systems, higher education, legacy resources, library consortia, integrated library systems (ILSs), library automation system (LAS), information and communications technology (ICT), print resources, resource sharing, tertiary Institutions, staff training, user training.

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DEDICATION

I am dedicating this thesis to my beloved mom, Mrs. Stella Sikhosana, thank you for your emotional support, prayers and encouragement.

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GLOSSARY

Abbreviation	Meaning
CALICO	Cape Library Cooperative
CHE	Council on Higher Education
ERM	Electronic Resource Management
ERMS	Electronic Resource Management System
ICT	Information and Communications Technology
ILL	Inter-Library Loans
ILS	Integrated Library System
LAS	Library Automation System
SANLiC	South African National Library and Information Consortium
SU	Stellenbosch University
UWC	University of the Western Cape
UCT	University of Cape Town

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

The development of electronic resource management (ERM) systems emerged in the early 2000s, when it became clear that traditional integrated library systems (ILSs) did not have sufficient capacity to provide efficient processing for meeting the changing needs and challenges of today's libraries. These challenges include managing a wide range of licensed electronic resources, collaborating, cooperating and sharing resources between libraries (Fu & Fitzgerald, 2013). Prior to ERM systems, electronic resource manager's stored information in a variety of places and formats such as in-house databases, spread sheets, emails, and paper files. The databases were used to store subscription details, passwords, vendor contact information and license agreements (Ballard & Lang, 2007). During the 1990s, the internet revolutionised information access and library operations around the world and together with the rapid increase in the number of electronic resources created a demand for the management of these resources (Cudakar, Tuglu & Guradal, 2013).

This research is about electronic resource management (ERM) as well as the development of electronic resource management systems (ERMSs) in libraries. Libraries developed their own ERM systems to integrate elements such as the relationship between packages and their constituent parts, use permission and constraints, authentication and contact information, workflows for database trials or testing, licensing, ordering, implementing access, as well as notifying relevant users of the latest available data (Kasprowski, 2006). The home-grown systems were enhanced by the ILS, also known as library automation system (LAS) that manages the library environment and workflow (Wang & Dawes, 2012). The ILS is designed to manage print resources, and with the increasing demand of digital and electronic resources, does no longer meet the needs of library staff and users in managing and accessing electronic resources. The integrated library system (Aleph 500) is in a period of transition as the contracts with libraries expire in 2017. Next-generation library systems are being explored. The library literature has been referring to these as a second-library automation or next-generation library system that was been introduced in 2011. Wang and Dawes (2012) state that libraries are at a tipping point for a dramatic change of library automation systems. Libraries find it difficult to manage electronic resources effectively and efficiently in order to meet their business requirements.

The study shows that there is gap in literature as far as research goes for the management of electronic resources at selected tertiary institutions in the Western Cape, South Africa.

1.2 Background of research

Academic libraries in the 21st century are faced with several challenges, both internal and external. As with any other organisations, whether public or private, university libraries are facing increasing pressure from governing and accreditation bodies to provide outcome assessments of their performance and to apply business tools to analyse and evaluate their operations (Thamaraiselvi, 2009). Academic libraries are also facing financial and economic challenges. From 2013 to 2014 the international subscription for electronic resources has increased between 5% and 15%. The introduction of the new VAT act (Value Added Tax Act no. 89 of 1991) which came into effect 1 June 2014, and the fluctuations in the exchange rates have had a negative impact on the subscription budget of libraries (National Treasury Department, 2014).

Today's libraries manage a wide range of licensed electronic resource subscriptions and purchases. The ILS is able to maintain the subscription record and payment histories, but is unable to maintain details about trial subscriptions, license negotiations, license terms, and use restrictions. According to Fu and Fitzgerald (2013), some vendors have developed ERMs as products, standalone products or as fully integrated components of ILS. However, it is more efficient to manage print and electronic resources, using a single unified workflow and interface.

The seven electronic resource collection key concepts for managing electronic resources in libraries—collection development, technical feasibility, functionality and reliability, vendor support, supply, licensing, and electronic resources (e- resources)—provide a holistic view of the research approach:

1.2.1 Collection development

Collection development came into wide use in the late 1960s to replace selection as a more encompassing term, reflecting the thoughtful process of developing the library collection in terms of institutional priority and the community or users' needs and interest (Johnson, 2004:1). Johnson further states that "in the 1980s, the term collection management was proposed as an umbrella term under which collection development was subsumed". Fieldhouse and Marshall (2012:5) further explain the relationship between 'collection development', 'selection' and 'acquisitions' as a hierarchy, and define collection development as:

> "…a planning function, a collection development plan or policy which describes the short and long-term goals of a library as far as the collections are concerned, taking into account the correlation with the environment aspects such as audience demand, need and expectations, the information world, fiscal plans and the history of collection".

Libraries without collection development policies are like businesses without business plans (Johnson, 2004). Johnson further argues that a collection development policy describes the collection (on-site and remote access) as it is now and as it will be developed, while defining the rules and directing the development. A collection policy is a document that is systematic, comprehensive and detailed, and serves multiple purposes as a resource for public planning, allocation, information, administration and training. Mangrum and Pezzebon (2012) state that collection development policies in libraries have long been used to guide the growth of the library collections, but only some discussions to how policies can evolve to help manage the life cycle of ERM. The International Federation of Library Associations (IFLA) Guideline on key issues of electronic resources collection identifies six elements which are considered as important to be used in conjunction with traditional collection development policy (IFLA, 2015). These elements should provide guidance to assist selectors in establishing the library's expectations and preferences in relation to the following functions:

i) **Technical feasibility:** This includes availability of what methods of access are available, e.g. stand-alone, remote access via the Web, local Web mount, or hosting. Authentication includes what methods of authentication are available, for example, access via IP filtering is usually preferable because it typically provides simultaneous access for multiple users. IP address recognition also provides access to users via a proxy server, allowing authorised library users to access content from outside the physical confines of the library. Access is via a login password. Technical feasibility in electronic management is also about ensuring that resources are compatible with the existing library hardware and software, and that the library has the capability to provide effectively-maintained access to electronic resources cost efficiently.

ii) **Functionality and reliability:** The access of suitable electronic resources in terms of functionality and reliability is important for the library to evaluate the following:

- **Search and retrieval functionality**: A user friendly search engine is required for retrieval of electronic resources through keywords and Boolean searching, for example, full text searching, browsing, search

history, truncation, etc. Sorting and ranking data abilities for database results should be retrievable through author, title, date, relevancy, etc.

- **Exporting and downloading**: A variety of options can be used, for example, printing, e-mail, downloading to the machine, and downloading to an electronic device.
- **Interface**: The electronic resource interface should be user-friendly and easy to use, for example navigation, system intuitiveness, help and tutorials.
- **Integration**: The system should be able to integrate with other systems via reference and full text-linking using link resolvers, for example, SFX link-resolver from Ex Libris.
- **Response, reliability and availability**: In terms of response time the system must be accessible 24/7. The licensing agreement should reflect the availability of the system maintenance.

iii) **Vendor support**: It is important to select a well-established and a reliable electronic resources vendor and the technical and user support they are able to provide for the library service. It is important to determine the variety of vendor support services available, including the following:

- **User training and support**: It is necessary for the vendor to provide initial and on-going training, including the provision of documentation and an online manual in the use of the product
- **Trials and product demonstration**: It is important that a product be available for trial for the users to test before purchasing. Product demonstration by the vendor is also important for the purchase of electronic resources
- **Technical support and system notification process**: It is important for the vendor to agree on the service level in terms of system availability and response time for resolving technical issues.
- **Statistical reporting**: It is important for the vendor to be able to produce high quality statistical data for electronic resources usage statistics, to determine how cost-effective they are compared to other products
- **Customisation**: Provision needs to be made for options available from the vendor, for example, branding of the product
- **Provision of bibliographic data**: It is important for the vendor, if required, to provide URLs or bibliographic data required by the library

file format, which adhere to appropriate quality standards such as MARC records

- **Data security and archiving policies**: The back-up and data recovery of the system is important to determine what will happen to the resources of the library if the vendor declares bankruptcy or insolvency

iv) **Supply**: There is no standard model for packaging and pricing electronic resources. It is important to consider the variety of packaging models available in the market to determine the one that suits the library best in terms of access, archival rights and value for money. It is important to give careful consideration when reviewing the pricing available for electronic resources because there is no standard model for pricing electronic resources. For example, one important pricing model for subscription-based electronic journals is based on FTE (full-time equivalent). Purchasing or pricing models may include but are not limited to the following:

- Separate pricing for content access
- Combined model: a once off archive free and an annual access fee for more current models
- Pay-per-use pricing
- Rental models
- Consortia pricing

v) **Content**: The selection criteria of electronic resources content are similar to those of print resources, including the same guidelines and policies. The following criteria should be followed for evaluating content of electronic resources:

- Support the main research aims and goals of the library
- Supplement the existing collection supported by subject profiles
- Must be peer-reviewed and high quality content
- Support the requirements of key audience
- Produce an acceptable level of usage

vi) **Licensing**: Purchasing of electronic resources requires a licensing agreement. The license should support the evaluation process and ensure that it reflects the expectation of the library before purchasing. It is recommended that the following points governing the access of electronic resources by library patrons be covered by any licensing agreement a library, its institution or its consortia signs:

- Model/Standard licensing

- Governing laws
- Liability for authorised use
- Definition of authorised sites
- Fair use provision
- Termination of contract
- Refunds
- Period of agreement
- Compliance with the governing laws of libraries or consortia's legal jurisdiction, province, state, country

1.2.2 Electronic resources (E-resources)

Many authors define electronic resources as materials or services that require a computer for access, but not limited to numerical, graphical and textual files, full-text databases and internet resources. According to Johnson (2004), the phrase "electronic resources" is described as an "umbrella" term for all digital resources. Johnson further states that digital information exists in a format (numeric digits) that a computer can store, organise, transmit, and display without any intervening conversation process. Many libraries describe electronic resources as any information source that the library provides access to in an electronic format. Fieldhouse and Marshall (2012) state that the move towards digital resources for current book and journal provision has been a major thrust towards the digitisation of earlier material, in order to maximise access to scholarly material which was not born digital.

1.2.3 Electronic resource management (ERM)

The pursuit of electronic resources by libraries was driven by core values of library science. Yu and Breivolt (2008) argue that the technological development in library electronic resources during the 20th century was intended to make access to resources more direct, convenient, and timely to users. The implementation of electronic resources made the library a growing organisation as libraries adapted processes and reorganised staff repeatedly to accommodate the changes inherent in the use of constantly changing technology. Furthermore, Ryder and Leue (2012) indicate that libraries have been providing their patrons, or end-users, electronic resources for nearly two decades, and during that time librarians have selected various ERMSs to assist in managing complexities of electronic resources, including the facilitation of user access.

1.3 Aim of research

The aim of this research is to explore the challenges librarians are experiencing when implementing ERM systems.

1.3.1 Problem statement

The complexities of managing growing collections of electronic content make it difficult for libraries to implement and maintain electronic resource management systems to meet their business requirements (Abnu, Kataria & Ram, 2013; Feather, 2007; Kasprowski, 2006; Grover & Fons, 2004). Libraries are currently facing a challenge in managing electronic resources and collections budgets. According to Grover and Fons (2004), a number of authors have reported on the growing complexity and problems with managing information about electronic resources, as well as emerging solutions. They further argue that as the portion of the collections budget dedicated to electronic resources increases, so does the need to systematically support electronic resources through databases that provide a locus of management information related to staff and patrons. The libraries are also affected by the new electronic resources regulation published by the Department of National Treasury, detailing which digital products and services will be subject to the 14% VAT effective from 1 April 2014 (National Treasury Department, 2014).

Kasprowski (2006) states that the steps required for managing electronic resources are more complex than those of print resources, while Abnu, Kataria and Ram (2013) argue that electronic resources provide a viable comfort which its counterpart failed to provide, and further state that the effectiveness of the ERMS in any library depends on the library's available resources. The inability to adapt and cope with the challenges of the growing collection of electronic content results in the failure to successfully implement electronic resource management systems. Fu and Fitzgerald (2013), and Ryder and Leue (2012) and Collins and Grogg (2011) report that ERM systems that have been developed have addressed some needs very well, including the licensing management and administrative information storage, but failed to address issues such as interoperability. The authors further argue that basic functionalities that libraries had decades ago with ILSs are still not available on an ERM system. Fu and Fitzgerald (2013) are in support of Ryder and Leue (2012) that implementation of ERM systems and the integration with the new generation ILS will raise concerns with librarians and library staff pertaining to their job security, which can be fearful of new technologies.

The problem statement is formulated as follows:

Libraries find it difficult to implement and maintain electronic resource management systems to meet their business requirements.

Considering the stated research problem, the primary research question (PRQ) is formulated as:

PRQ: How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

The sub-research questions (SRQs) are as follow:

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

The objectives of these questions are:

- To investigate what factors will be affecting the implementation of ERM systems in libraries
- To identify barriers in the utilisation and access of electronic resources by users and library staff
- To investigate standards for ERM systems in libraries

This will be done by means of an analysis of the case study, to produce a guideline to assist libraries and academics to formulate a collaborative platform for stakeholders, libraries, the system vendors and the subscription agents, for the implementation and development of ERMS to identify the gaps in existing literature regarding managing electronic resources of a library for the further development and adoption of ERMSs.

1.3.2 Current status of research

Electronic resource management has become an increasingly important source of competitive advantage in the academic library sector. It enables libraries to not only increase productivity and streamline workflow processes (Collins & Grogg, 2011), but

to examine their own internal processes, challenge their own traditional acquisitions and workflows, and realign their staff to leverage the power of ERM systems. Furthermore, with greater integration of internal systems within their own institutions, librarians are looking for interoperability with enterprise-wide procurement and financial systems, as well as course management systems and intranet search engines (Ryder & Leue, 2012). Shifts in the higher education environment continue to have an impact on libraries in terms of collection/content development, access to and curation of new legacy resources and services to extended audiences (ACRL, 2013).The new trends to watch in higher education are increased online instruction with campuses experimenting with a mix of providers, globalisation, and increased scepticism of the “return on investment” in college degrees.

1.3.3 Utilisation and impact of accessing electronic resources in libraries

When a library decides to purchase electronic resources, it must also consider the method it will use to provide access to these resources, as typically, most electronic resources are available for access from the vendor. Since the many pricing models for electronic resources factor in size and user-base, vendors require that access to electronic resources be restricted only to authorised users of the library. Most license agreements clearly outline the need to control access only to those specified during the licensing process (Yu & Breivolt, 2008). Furthermore, Yu and Breivolt argue that the mechanism to provide access to these resources has change over the years. Initially these resources were accessed through the library’s website via an A-Z list or subject-based pages of databases and e-journals. As the amount of electronic resources grew and it became increasingly difficult to maintain the pages, many librarians began cataloguing e-resources and provided access to these via the Web-based catalog. More recently libraries have been using openURL link resolvers such as SFX from Ex Libris as the linking mechanism that provides access to electronic resources.

Gakibayo and Ikoja-Odongo (2013) state that academic libraries are an integral part of universities and have a critical role to play in supporting the core mission of the university, which is teaching, learning and research. Another study conducted reveals that the lack of proper ICT infrastructure; lack of ICT skills, including lack of knowledge of the current and future trends of librarians in their workplaces; low student electronic pattern usage; and pertinent issues affecting electronic resources (such as access and awareness) have not received attention in university libraries. Lastly, Madondo, Sithole and Chisita (2017) argue that electronic resources are under-utilised by students despite the availability of these resources in libraries.

In qualitative terms, accessibility and availability of print and electronic resources have an impact on the quality of teaching, research and publications, and in quantitative terms the research output of an institute, can be measured in terms of the number of research articles published in high impact journals, citations received, the number of patents, the amount of research grants and consultancies, the number of research reports, and honours and awards to faculty researchers (Arora, Trivedi, & Kembhavi, 2013). Furthermore, Okon and Lawal (2013) state that the growth of research in all fields of human endeavour is becoming increasingly detailed and sophisticated, and faculty members and graduate students are aware that the library has a great role to play in the provision of electronic information necessary to their day-to-day research, and as a medium of getting the latest scientific and technological information either in print or electronic form.

1.3.4 Factors affecting the implementation of ERM systems in libraries

The technology adopted by the traditional ILS was developed years ago and is evidently outdated. The traditional ILS does not have sufficient capacity to provide efficient processing for meeting the changing needs and challenges for today's libraries, such as managing a wide range of licensed electronic resources and collaborating, cooperating and sharing resources with different libraries (Fu & Fitzgerald, 2013).

According to Ingutia-Oyieke and Dick (2010), there are two main categories of barriers in accessing electronic resources, namely physical barriers and personal barriers. Physical barriers include inadequate infrastructure networks, lack of native language content and software, and restricted access to ICT facilities, especially the internet. Most libraries in academic institutions have no access to their own ICT infrastructure which results in problems accessing electronic resources. The personal barrier of library users is not knowing how to use and access electronic resources because of a lack of skills and training (Ingutia-Oyieke & Dick, 2010). Kaur (2011) indicates that it is particularly scholarly journals which are rapidly migrating to electronic media, and many journals are including value-added features such as backward and forward citation links to database images. Kaur (2011) furthermore states that the adoption of ERMSs seems to be a choice of bigger libraries with a higher rate of procurement and consumption of electronic resources, but the choice of smaller libraries still revolves around the cost-effective open-access ERM models and custom-made spread sheets and link-resolvers. The Web creates opportunities, challenges and expectations that are fuelling the changes in the ILS. Librarians are dismantling systems and creating new modules out of frustration with the inflexible and lack of extensible technology of

their proprietary systems. The shift from traditional methods to innovative methods of managing electronic resources implies that as new technologies evolve, libraries are in need of restructuring of different aspects of ERM to bring clarity and acceptability. Research and innovation are needed on different aspects of ERM. The adoption of ERM should lead to efficient management and thereby, optimal access to library resources (Patra, 2017).

1.4 Limitations of research

This research is limited to a selected tertiary Institution in the Western Cape, and will focus only on academic libraries engaged in managing ERMS activities. It will exclude the following types of libraries:

- Public libraries
- Special libraries
- Research libraries

1.5 Assumption of the research

The expected result from the study is that the growth and development of electronic resources activities has been slowly adopted by libraries in their business environment. Considering that the access and ICT infrastructure problems are one of the specific types of barriers that affect the utilisation of electronic resources in libraries, the role standards of ERM systems play a significant role in the development of electronic resource management.

1.6 Contribution of the research

This research contributes to the perception of libraries in managing electronic resources at selected tertiary institutions in the Western Cape, South Africa. It also provides a guideline for librarians to use for successful implementation of an ERM system.

1.7 Ethical considerations

There are ethical principles the researchers must follow in the research process (Resnik, 2011). Issue such as anonymity of participants, confidentiality of data collected, and information of concern will be adhered to in this research:

- The research will ensure informed consent will be obtained from the library
- Permission will be obtained from each interviewee about the nature of the study and the participation will be voluntary
- The research will not disrupt the general work of the interviewee

Ethical practice in relation to research colleagues involves the following:

- The research will be undertaken in a scholarly manner and with dignity
- Honesty, confidentiality and anonymity will be practiced in this research
- All sources of information and support will be acknowledged
- The findings will be presented as completely and honestly as possible, and will not intentionally mislead others as so to the nature of the findings

Ethical practice in relation to research participants:

- There will be no physical or psychological harm to the research participants (non-malfeasance)
- The research will be of benefit to research participants (beneficence)
- The research participants will only be involved in this study voluntarily, and they will have the right to withdraw from the study at any time
- The process will ensure the anonymity and confidentiality of the research participants (anonymity)
- The research will not be done to embarrass or ridicule participants (dignity)

Ethical practice in relation to the environment:

- This research will not be harmful to the research environment

Ethical practice in relation to South African society:

- This research aims to assist South Africans who manage electronic resources in libraries

1.8 Chapter summary

Chapter One: Introduction

Chapter one provides an overview of the research of electronic resource management in libraries. The chapter also provides a broad overview of the research problem, research questions, research sub-questions, research objectives, research design and the methodologies.

Chapter Two: Literature review

This chapter provides a literature review of the key concepts and background of the research. It includes: an overview of electronic resource management systems in libraries and Electronic Resource Management systems in libraries, the life-cycle of electronic resource management in libraries, technological factors affecting the integration of ILS and ERM and, finally, resource sharing, role of library consortia in South Africa, and the standard of electronic resource management will be discussed.

Chapter Three: Research methodology and design

Discusses the research design process, methodologies approaches used, data collection methods, sampling techniques, analysis and method, finally, the researcher explores ethical considerations is also discussed.

Chapter Four: Results from the interview

In this chapter the results from the interviews with the respondents are presented.

Chapter Five: Discussion of findings

Presents the discussion of findings and themes developed from the findings are discussed.

Chapter Six: Recommendations and conclusions

Present the recommendation and conclusions of the study based on the finding.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides a literature review of the key concepts and background of the research. Firstly, the libraries' global and current trends in ERM in higher education are discussed (section 2.2). This is followed by an overview of ERMS in libraries (section 2.3), an overview of physical and electronic resource management (section 2.4) the life-cycle of ERMS in libraries (section 2.5), technological factors affecting the integration of ILS and ERMS in libraries (section 2.6), resource sharing and the role of library consortia in South Africa (section 2.7), and finally, the standard of ERM are discussed section 2.8.

2.2 Libraries global and current trends in ERM in higher education

The libraries with limited resources in an academic environment are slow to adopt ERMS. There is little literature in a more holistic sense written about ERM (Yu & Breivolt, 2008). Yu and Breivolt (2008) further state that academic libraries require best strategies and practices to improve productivity and efficiency for those who manage electronic resources. Shifts in the higher education environment continue to have an impact on libraries in terms of collection development or content development (Anunobi & Okoye, 2008). Anunobi and Okoye further state that the trends to watch in higher education are the increased use of online instruction, with campuses experimenting with a mix of providers, globalisation, increased scepticism of the return on investment in a college degree, and the "role of academic libraries in the digital age for the focal point of teaching and learning, and research, and it is expected to provide standard information resources". According to Marshal (2017) libraries today have no tolerance for secure technology products that limit access to underlying data and cannot be easily integrated into related business systems. As industries transforms and new technologies evolves, libraries face challenges to respond thoughtfully. As suppliers develop synergies among content and technology products, libraries need to make sure that the outcomes align with their strategic goals and objectives.

2.3 ERMS in libraries

ERMS is defined as an "online database system intended for integrating all of the information used to manage electronic resources, and storing the information in a central location" (Webster, 2008:32). Libraries are providing their users access to electronic resources for nearly two decades. During that period, librarians selected and deployed various electronic ERMSs to assist in managing the intricacies of

electronic resources, including the facilitation of user access. As the migration from print to electronic resources takes place, librarians maximise workflow improvements derived from ERMS implementation, and adjust processes to accommodate aspects of electronic resources in order to gain more value from the systems and tools that handle electronic resources (Ryder & Leue, 2012). Collins and Grogg (2011) argue that the complexity of ERM is often underestimated by those not deeply involved with the systems. Managing electronic resources is a complex process which involves combining LMS, ERM, knowledgebase, link resolver, analytics, and A–Z journals search all in a single unified platform. But that is not always the way the faculty and students want to retrieve information because patron records are now in a cloud based system and most libraries may not be comfortable purchasing electronic products considering the safety of cloud technology (IFLA, 2017).

Librarians' top six ERM priorities include workflow and the management of communication and licenses, as well as statistics, administrative information storage, acquisition functionality and single priority interoperability across the system (Collins & Grogg, 2011). To aid ERM, librarians and vendors developed sets of standards and guidelines (section 2.8). The most accepted guidelines are Digital Library Federation (DLF) and NISO's ERM. The DLF ERMi Initiative recommends the basic functions and structure of a database approach to managing electronic resources.

Library vendors have created an array of electronic resource management products, many of these developed by companies typically associated with library information and management of ILS Vendors (ERM Task Group, 2013). With the noble initiatives of DLF and NISO and the subsequent streamlining of the functional requirements for good ERM systems, a host of new developments started adorning the information landscape. Many of the commercial, some independent and others open access systems, started appearing and integrating with library systems. Some examples are: the CUFFS open source system, Gold Rush, Ex Libris Verde, Innovative interface ERM, and HERMIS (Abnu, Kataria & Ram, 2013). Most ERMSs, whether commercial or open source, have not been able to fully integrate processes such as the acquisition process into the acquisitions workflow of current ILSs, causing a challenging workflow for the library staff (Wang & Dawes, 2012).

2.4 Overview of physical and electronic resource management

Over the past 10 years, the number and variety of electronic resources have been continually growing, and the processes associated with managing them appear to be ever more complex (Yu & Breivolt, 2008:91). While some organisations integrate ERM systems into the technical services processing, others rely on a variety of options in

different parts of the organisation to accomplish these tasks. In all these models, staffing for managing electronic resources has been challenging because of the diversity of new skills needed. DLF's Electronic Management Initiatives (ERMi) provides recommendations for ERM collection development, acquisitions, access and delivery from a technology and system perspective. The electronic resource management flowchart provides a detailed overview of activities associated with managing the life cycle of electronic products, and is intended to be generally applicable to the process followed at most institutions. While there are some similarities between the acquisitions and management process for traditional physical library materials and those of electronic products, there are many issues and complexities unique to ERM (Jewel, 2002). Figure 2.1 gives an overview of the physical and electronic resources workflow which highlights the similarities and differences between the two processes.

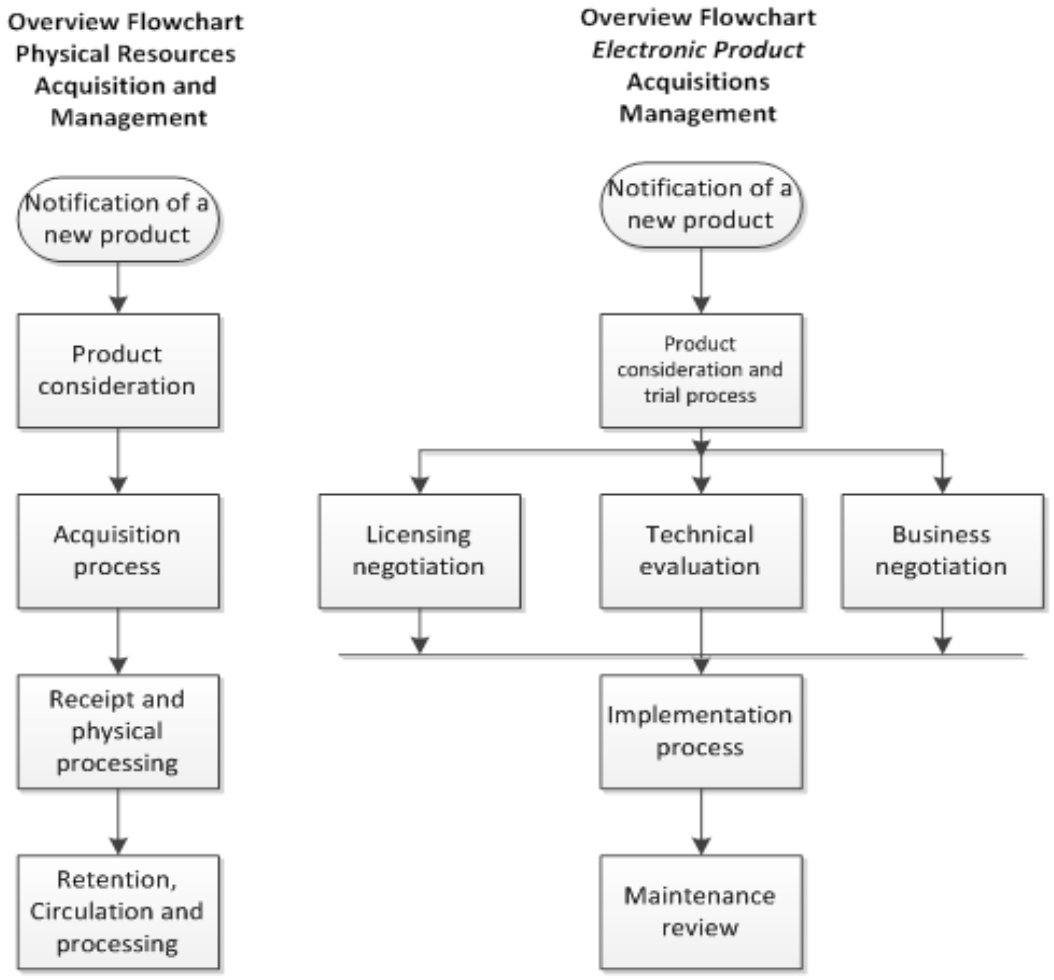

Figure 2.1: Flowchart overview of the acquisitions of physical and electronic resources
(Yu & Breivolt, 2008:92)

This flow chart describes the major processes in electronic resource management. The purpose of this flowchart is to give guidelines to libraries when designing their own internal ERM processes.

2.5 Life-cycle of electronic resource management in libraries

Yu and Breivolt (2008:92) describe a business process as a “continuous series of enterprise activities, undertaken for a process of creating output. The starting point and the final product of a business process is the output requested and utilised by corporate or external customers. Business processes often enable the value chain of an enterprise as well as to help focus on the customer when creating output”. The process of ERM in libraries is often referred to as a “life cycle”, and this management process is commonly rendered in circular diagrams (Anderson, 2014). Abnu, Kataria and Ram (2013) indicate that to understand the dynamics of electronic resources in an academic library, it is appropriate to analyse the life cycle of electronic resources.

There are six different processes, starting from the discovery of electronic resources to its trial period, selecting the resources, acquiring the resources for the library, providing the access for the users and the successive decision of continuation and renewals. According to Yu and Breivolt (2008:50), the selection process is a three-step process which includes identification or discovery, evaluation, and finally the decision to select the product:

- **Start:** Awareness of product—discovery and identification of the resource. At this stage identification of the resource for an academic institution starts from various sources (Faculty Department, Faculty Librarian, e-mail alert, publisher, professional journals, list serves, webpages, etc.)
- **Second stage:** Evaluation of the product—once the product has been identified, evaluation is the second critical step for selectors. Evaluation helps the selectors to determine the cost, the reliability of the content provider, and most importantly the authoritativeness of the resource. A selection tool such as trial or demonstration of the product by the provider helps in evaluating the product and decision-making of selecting e-resources
- **Finally:** Selecting the resource—acquiring the resource for the library, providing access to it for the users and the succession of continuation and renewals
- Once the discovery stage has been accomplished, the rest of the process runs smoothly until the resource reaches the access level

- The life cycle (Figure 2.2) of electronic resources does not end with providing access alone to the users, but goes beyond in monitoring its usage and continuation of the same with the users

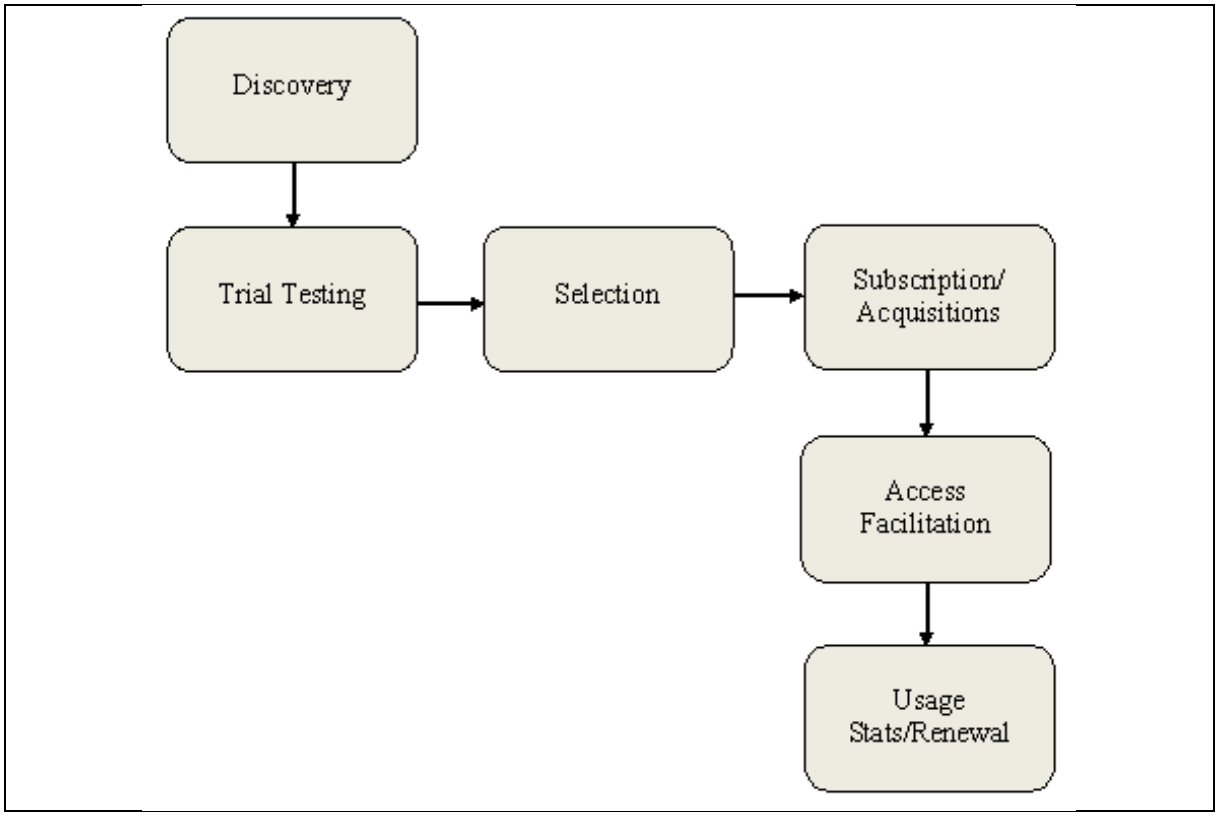

Figure 2.2: Life-cycle of electronic resources
(Abnu, Kataria & Ram, 2013:301)

2.6 Technological factors affecting the integration of ILS and ERM systems in libraries

The ILS, also known as LAS, has been introduced in the late 1980s and early 1990s. After two decades, the rapid change resulted in libraries facing tremendous changes in terms of both the resources and services that libraries provide to their users.

The fast increase of electronic resources is changing the library collections from print to electronic resources (Wang & Dawes, 2012). Furthermore, since the global financial crisis libraries have been facing severe budget cuts while hardware and software maintenance as well as software licensing continues to rise. To add to this hostile environment, technology adopted by ILS was developed more than ten years ago, and it is evidently outdated (Fu & Fitzgerald, 2013). The ILS has not changed in the past two decades.

The web creates opportunities, challenges and expectation that are fuelling the change in the ILS. Librarians are dismantling systems and creating new modules out of frustration with the inflexible technology of their current systems. Vendors are also creating standalone products such as ERMS to harness newer technologies to capture or create new market shares (Pace, 2004). According to Breeding (2005), LAS aims to provide an electronic version of the card catalogue and to automate the functions of libraries, including physical material, those systems centred on print media, establishing the basic model for a computerised bibliographic system, and creating standards. Breeding (2005:28) further argues that "we—vendors and librarians alike—allowed the ILS to be static, and by doing so we diminished possibilities of software that delivers more compressive automation for library workers and seamless access to information for library users". Library staff become frustrated with the ILS, noting its inadequacy dealing with the daily tasks. Library users get confused with the many interfaces and complexities of library applications and systems. Libraries are nearing the tipping point for the dramatic change towards automation. Literature refers to this automation as a second-generation library automation system or, the next generation library system (Wang & Dawes, 2012). Breeding (2005) indicates that the new generation library systems, for example, Alma by Ex Libris, will unfold in future years. It is important that these new technologies continue to advance and be reinvented in ways that overcome the limitations from the systems previously implemented.

2.7 Resource sharing and role library consortia in South Africa

Libraries use library consortia as a form of networking. The exact date for the introduction of the term "library consortium" is not clear, but the concept of a consortium as being an association or partnership has long been a tenet of librarianship (Nfila & Darko-Ampem, 2002). The collaboration implies building a strong business relationship with stakeholders, and building ERM systems as an interactive process, in order to work together towards a more integrated electronic resources solution (Collins & Grogg, 2011). Libraries have talked a great deal about resource sharing, and the mode of operation whereby many libraries share their resources and services. Libraries have always shared information about their library holdings and encourage users to visit other libraries. The Union catalog of library holdings and inter-library loans are the classic examples of the sharing and collaboration that takes place between libraries. Digital resources and networking, although with their own challenges, have created opportunities for the organisation for services, maintaining visual/digital libraries and venturing to co-operative arrangement in collection development (Manjunatha & Shivalingaiah, 2003).

Currently, South Africa has five library academic consortia. Given the socio-political context and the extraordinary changes that have occurred in South Africa in the 1990s, it is not surprising that the motivation to cooperate and the nature, intensity and the success of that cooperation vary widely among the five major consortia in South Africa (Darch, Rapp & Underwood, 1999). The library consortia in the Western Cape, South Africa is called the Cape Library Consortia (CALICO). CALICO was established in 1992 by Melon Foundation (Thomas & Fourie, 2006). The CALICO consortium consists of the University of the Western Cape, University of Cape Town, Stellenbosch University and the Cape Peninsula University of Technology. CALICO uses a single shared ILS called ALEPH 500 for the four universities and is currently been used as a resource sharing tool.

2.8 Standards in ERM

As libraries have worked to incorporate electronic resources into their collections, services, and operations, most of them found that existing ILSs were not capable of supporting these new resources. The DLF and ERMI are organised to support the rapid development of such systems by producing a series of interrelated documents to define needs and establish data standards. A National Information Standard Organisation (NISO) and DLF workshop in May 2002 led to the creation of a steering group that guided the development of an ERMI (Jewel, 2002). Ryder and Leue (2012) describe the role of standards of ERMS as uniformity, whether it is related to storage, retrieval, transmission or description of data, assists in the integration of multiple systems e.g. ILS, OPAC and ERMS. The integration of all three systems makes it much easier and less labour intensive to move information from one level to another. These standards have not been widely adopted in the industry; standards related to gathering and of usage statistics and linking—SUSHI, COUNTER and Open URL—are widely used. The Joint Information System Committee of the UK (Kasprowski, 2008:29) defines seven roles for the business use of standards as:

i) **Reduction of re-keying:** Migrating information from one system to another.

ii) **Reduces maintenance costs and disruption:** The old and new systems, adhering to the same standards, are still able to communicate, reducing the need to change the system every time a new one comes along.

iii) **Durability of data:** The more support there is for a certain standard, the longer it remains in use.

iv) **Avoidance of supplier log:** Migration of one vendor to another is less daunting.

v) **Easier development path:** It is easier to develop technologies that work together when incorporating a common “language”.

vi) **A platform of collaboration:** Librarians and vendors can work together in creation and maintenance of standards.

vii) **Whole system economics:** Multiple services can work together more easily when adhering to the same standard.

According to Yu and Breivold (2008:304), with the “integration of ERM functionality into their processing, the libraries will have higher expectations of functionality and interoperability, and increased standardisation possibilities will begin to emerge”. An ERM system, by nature, needs to integrate into an existing library and broader institutional environment, which is the local library system as well as other applications and services. The use of standards is therefore of major importance for enabling such integration to succeed (Sadeh & Ellingsen, 2005).

2.9 Summary

ERM is increasingly important as academic libraries continue to collect a wide variety of resources in electronic formats to support teaching and learning. The libraries in academic environments have been slow to adopt ERMS, with limited resources for major activities such as managing electronic resources. There is not much literature about electronic resource management in a more holistic sense. Electronic resource management systems are being developed to improve productivity, but effective software about electronic resources records, e-mail, text files, and project management is not yet available. Creating software with such functionality, and establishing best practices could dramatically improve efficiency and productivity of those who manage e-resources.

Furthermore, the technology adopted by the traditional ILS was developed years ago and is outdated; the traditional ILS does not have sufficient capacity to provide efficient processing for meeting the changing needs and challenges for today’s libraries, such as managing a wide range of licensed electronic resources and collaborating, cooperating and sharing resources with different libraries. The literature acknowledges that It is encouraging to see that in both the commercial and open source arenas, concrete steps are taken to develop systems that will manage library resources such as Ex Libris Alma, Kuali Ole and OCLC WorldShare, which are some of the next generation ILSs in development. Since these products are still in development, and implementation is not yet widespread, their success in meeting the needs of the library community is still to be seen. Furthermore, it is important to acknowledge that ERM is not only about technology, it is about effectively managing

all the library resources and collections, including flexible workflow management which can also assist libraries in their strategic planning to improve library services to its users.

In Chapter Three, the research methodology design is discussed.

CHAPTER THREE: RESEARCH METHODOLOGY AND DESIGN

3.1 Introduction

It is evident from Chapter Two that the libraries in the academic environment have been slow to adopt ERMS, as a result of limited resources, for major activities such as managing electronic resources. The technology adopted by the traditional ILS was developed years ago and is outdated (Fu & Fitzgerald, 2013). The rapid growth and increase of electronic resources create challenges and opportunities for libraries to manage electronic resources in their business environment. The research methodology is designed to answer the following primary research question and sub-research questions:

PRQ: How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

The sub-research questions:

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

In this chapter the following are discussed: i) Research philosophy; ii) research design and methods; iii) case studies; iv) data collection; v) data analysis; and vi) ethics.

3.2 Research philosophy

There are two broadly divergent views about the nature of knowledge, or what is called competing paradigms. The first view is the positivist paradigm (Ontology, Objectivism, Epistemology, Positivism) associated with quantitative research strategies, and secondly, the interpretive paradigms (Ontology, Subjectivism, Epistemology, Interpretivism) associated with qualitative research strategies (Henn, Weinstein & Foard, 2006).

“Ontology is a set of assumptions about what the social world is, and epistemology is a way of knowing about that world which reflects the assumption; our ontological

perspective feeds into our epistemological perspective which is further reflected in our methodological approach" (Henn, Weinstein & Foard, 2006:17). According to Mouton (1996:8), ontology can be defined as "the study of 'being' or 'reality', thus, ontological assumptions about human nature, society, the nature of the history, the status of the mental entities, observable and material phenomena, and intentionality in human action behavior". The ontological stance of this research is interpretivism.

Epistemological assumptions are assumptions about the nature of knowledge and science, or on the content of "truth" and related ideals (Mouton, 1996:47). According to Henn, Weinstein and Foard (2006), epistemology is a crucial philosophical concept for social scientists which considers questions to do with the theory of knowledge. Subjectivist ontology with an epistemological stance of interpretivism followed (Myers, 1997). The epistemological theory of this research is concerned with the lack of clear understanding of how libraries can, in the academic and research environment, maintain and use ERMSs for increasing productivity and workflow efficiency. An inductive approach was used to build towards a possible guideline for libraries. This stance allowed the researcher to propose a guideline to assist the library and the academic environment to formulate a collaborative platform for stakeholders, libraries, the system vendors and the subscription agents. To achieve the aim of this research, the researcher adopted an epistemological stance to gain knowledge of how libraries can, in the selected tertiary institution, adopt and implement ERMS to effectively manage electronic resources to sustain and improve business processes. In this research a subjectivist and interpretivist stance were followed.

Interpretative researchers are keen to reinforce the distinction between the natural and social sciences. This interpretive paradigm is associated with an unstructured qualitative method, including the participant observations and in-depth interviews (Henn, Weinstein & Foard, 2006). The design approach for this research will be based on interpretive paradigm principles. The researcher used a qualitative research approach. This is the most suitable method to propose a guideline to assist the library and the academic environment to formulate a collaborative platform for stakeholders, libraries, the system vendors and the subscription agents. In this research an interpretive philosophy and case study methodology are used.

'Qualitative' implies an emphasis the qualities of entities, and processes and meanings that are not experimentally examined or measured in terms of quantity, amount, intensity, or frequency. Qualitative research stresses the "socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry" (Denzin & Lincoln,

2005:10). Qualitative research uses a wide variety of the methods of data research, and the most commonly used methods are in-depth interviews and particular observations (Henn, Weinstein & Foard, 2006:160). The research done in this study is qualitative in nature.

This philosophy would assist the researcher to form a clear view of how electronic resource management affects libraries' implementation of ERMS in South Africa. The interpretivism paradigm is identified as the most suitable underpinning philosophy for this research. This is reinforced in the context of the stated research problem and research questions.

3.3 Research design and methods

A research design is defined as a 'set of guidelines and instructions to be followed in addressing the research problem' (Mouton, 1996:107). This indicates that the researcher needs to have a clearly defined purpose for the research study and clear research questions. The aim of a research design process is to achieve the principal goal of the research. The aim of the research (section 1.1.2) is to explore the challenges librarians are experiencing when implementing ERM systems. The nature of this research problem and associated research question formulated in section (1.1.3) and repeated above, fundamentally drive the selection of methods. A qualitative research uses a wide variety of the methods of data research, the most commonly used methods are case studies, in-depth interviews and particular observations (Henn, Weinstein & Foard, 2006).

3.4 Case studies

Case studies are a common way to do qualitative inquiries. The term "case study" is emphasised because "it draws attention to the question of what specially can be learned about a single case study" (Denzin & Lincoln, 2005:443). According to Yin (2009:11), there are three case study approaches, identified as *"*explanatory, exploratory and descriptive*".* A descriptive case study method is selected as the most suitable to understand the research problems and the investigations of the research questions. In this study a multiple case design was used to produce a detail description of the experience of libraries in implementing ERM systems.

Yin (2009:59) states that the rationale of multiple-case study design derives directly from understanding of literal (where the cases are designed to support each other) and theoretical replications (where cases are designed to cover different theoretical conditions). The simplest multiple case study design would be the selection of two or more cases that are believed to be a literal replication, such as set of cases with

exemplary outcomes in relation of some evaluation question. The research case study strategy followed was that of a multiple case study. Three libraries were used as case studies. Interviews were also conducted using semi-structured questionnaires (Yin, 2009; Easterby-Smith, Thorpe & Jackson, 2012). This research strategy better assisted in the attempt to answer the research question: "How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?"

According to Greenfield (2009:187), objectivity is usually interpreted as meaning that the selection method should not permit any subjective influence, and should be unbiased. If a sample design is unbiased, the average value of the sample statistics across a large number of repetitions of the study will equal the corresponding population parameter. Three biased-related problems identified in this research were respondents giving inaccurate information, concern about confidentiality of information, and actions not taken to embarrass or ridicule participants. Furthermore, Yin (2009:72) argues that best way to reduce bias is to test one's own tolerance for contrary findings, and to report preliminary findings while still in the data collection phase, and to two or three critical colleagues. The colleagues should offer alternative explanations and suggestions for data collection. In this research a pilot project was done by conducting interviews using semi-structured questionnaires with three senior library staff managing electronic resources. The results of the pilot study were discussed with senior researchers for clarification and improvement of the questionnaire.

3.4.1 The unit of analysis

The sector from which participating libraries were identified was tertiary institutions managing electronic resources as the units of analysis. These tertiary institutions were considered relevant due to the impressive history of adapting to the unified Aleph Library Integrate System (ILS) and the establishment of CALICO (Cape Library Consortium) to coordinate the management of the system to reduced costs and shared collaboration. The non-randomly selected tertiary institutions (3) were selected using convenience sampling. The libraries are in the surrounding Cape Town area and are easily accessible. The selected libraries agreed to participate and nominate knowledgeable staff.

3.4.2 The units of observation

- Library Director Technical Services, with the responsibility of managing the library collection, collection development and electronic resources

- IT Manager, with the responsibility to manage e-resources management infrastructure
- Systems Librarian, with the responsibility of managing the system and requirements for electronic resource management
- Aleph Coordinator, with the responsibility of managing the Aleph integrated library system for the three libraries through CALICO consortium
- Electronic Resources Librarian, with the responsibility of managing electronic resources including administration, managing contracts, licensing agreements
- Faculty Librarian, with the responsibility of discovery, retrieval, marketing and promotion of electronic resources
- Acquisition/Serial Librarian, with the responsibility of acquisition of electronic resources
- Research Librarian, with responsibility of researching new products, external and internal liaison of current and future trends in electronic resource management
- Institutional Repository Librarian, with the responsibility of managing the Institutional Repository and the uploading of university research output, theses and dissertations

3.4.3 Case study protocol

Yin (2009:79) states that “protocol is a major way of increasing the reliability of case study research and intended to guide the investigator in carrying out the data collection from a single case again, even if the single case is one of several in a multiple-case study”. Yin (2009:86) argues that “the question in the case study protocol should distinguish clearly among different types of levels of questions”. The potential relevant questions can occur on five of the following levels:

- *Level 1*: questions asked of specific interviewee
- *Level 2:* questions asked of the individual case
- *Level 3:* questions asked of the pattern of findings across multiple cases
- *Level 4:* questions asked of an entire study, for example, calling on information beyond the case study evidence and including other literature or published data that may be reviewed
- *Level 5:* normative questions about policy recommendations and conclusions, going to the narrow scope of the study

3.4.4 Field protocol

Field protocol consists of procedures for conducting research. Greenfield (2009:196) explains that “most research involves visits to members of the sample to collect

information from them". For example, one might interview people, or measure them, or observe certain behaviour. Three libraries were used as case studies. Interviews were conducted using an interview guide with semi-structured questions (Appendix A) (Rugg & Petre, 2007:138). Yin (2009:85) states that case study field procedures of the protocol need to emphasise the major tasks in collecting data, including:

- Gaining access to key organisations or interviewees
- Having sufficient resources while in the field, including a personal computer, writing instruments, paper, paper clips, and a pre-established, quiet place to write notes privately
- Developing a procedure for calling for assistance and guidance, if needed, from other case study investigators or colleagues
- Making a clear schedule of the data collection activities that are expected to be completed within specified periods of time
- Providing for unanticipated events, including changes in the availability of interviewees, as well as changes in the mood and motivation of the case study investigator

3.4.5 Interview structure

The interview protocol was structured in three parts:

i) **Factors affecting the implementation of ERM systems in Libraries:** This section aims to investigate the factors that will be affecting the implementation of ERM systems in libraries.

ii) **Utilisation of electronic resources:** This section aims to identify the impact and challenges of accessing and utilisation of electronic resources in libraries.

iii) **Standards of electronic resource management:** This section aims to identify critical success factors of ERM for libraries in selected tertiary institutions.

3.5 Data collection

A case study allows the researcher to make use of diverse strategies to collect data. Easterby-Smith, Thorpe and Jackson (2012:61) describe the main ways of collecting qualitative data, namely, "the interview, observation, participant observation and documents". Interviews and documentary data have been identified as a rich source of data for social research and are used to collect data and produce relevant information. Multiple sources of information and promotional material such as brochures, pamphlets and flyers and other documents which provided details of the library, profile, strategic directions and other business activities from three libraries,

were used in the case study. In some cases the researcher was given permission to access the libraries' websites and online databases.

Interviews were conducted using semi-structured questionnaires. To support the aim of this research, a case study protocol was designed in section 3.4.3 as adapted from Yin (2009:87). In this research, interviews were conducted using semi-structured interviews, and the following procedures were followed:

- Initial telephonic contact was made with each institution
- The Institutional Directorate Office established to act as a contact with the Directorate in each library
- A number of respondents were identified in consultation with the trusted intermediary in each library, and each respondent was approached to be interviewed
- Face-to-face interviews were conducted in all cases
- Interviews were tape-recorded by prior arrangement with management and respondents
- Additional evidence was collected from libraries

Yin (2009:79) states that having a case study protocol is desirable under all circumstances, but essential if you are doing a multiple case study. The researcher identified the libraries at selected tertiary institutions in the Western Cape according to the definition of establishment of Academic Library Consortia. From the list of potential units of analysis, three tertiary institutional libraries were selected. The libraries were selected based on the fact that they all manage electronic resources and that they all use online databases, open access and other online platforms to access electronic databases through their library webpages. The researcher contacted the libraries via telephone to establish if they were willing to participate in the research. Following the telephonic conversation, the institutions referred the researcher to the Institutional Research Office to obtain institutional permission to conduct research in their libraries. The libraries requested the researcher to send the specific institutional permission to the Library Director to obtain permission to conduct interviews. A week after the email was send to the Library Directors, one library (Library A) responded to the email and set the date for the interview. Afterwards, interviews were conducted with two more libraries, B and C, in order of their response. All interviews were conducted within the period of six months (August 2014 – January 2015). The researcher at each library requested multiple sources of information and promotional material such as brochures, pamphlets and flyers and other documents which provided details of the library, profile, strategic directions and other business

activities. In some cases the researcher was given permission to access the libraries' websites and online databases.

3.6 Data analysis

3.6.1 Transcription

Data analysis is defined by Yin (2009:109) as "a process which involves examining the evidence to address a research problem". In this research, a semi–structured interview was used. All interviews were transcribed. A problem while transcribing encountered was because of poor audio, based on noise restriction outside the interview venue. Libraries have low restrictions regarding noise and in most cases respondents had to lower their voices during interviews, which resulted in poor audio. In some instances, there was a cross-check with the respondents and corrections were made. In one case it was difficult to locate the respondent, which resulted in the respondent been withdrawn from the interview. The process took approximately eight months from the date of the interview.

3.6.2 Coding

The coding was initiated by carefully reading and re-reading the transcripts. Keywords and key concepts were highlighted with different colours. These key words and concepts were then transferred to the spread sheets as codes.

The codes were then evaluated in terms of the interview questions, and findings were derived from the codes. A cross-case synthesis technique was used. Yin (2009:156) states that this technique applies specifically to the analysis of multiple cases; the analysis is likely to be easier and the findings likely to be more robust than having only a single case study. The documents, papers and other information collected were also coded in the same manner.

3.6.3 Categories and themes

From the findings, categories were developed, and from the categories, themes were developed. The themes were then linked to the research questions in order to answer these questions.

3.7 Ethical considerations

Ethics, in its widest sense, as the principles of good human behaviour, is one of the issues which philosophers have striven to provide guidance on (Greenfield, 2009). There are principal ethical principles researchers must follow in the research process (Resnik, 2011). Issues such as anonymity of participants, confidentiality of data

collected, and informed of consent, were adhered to in this research. Ethics includes the “whole question of what you are researching, and why you are researching that rather than something else. There is also related sorts of questions about the presuppositions built on your research” (Rugg & Petre, 2007:56). This principle enabled the researcher to secure the trust and necessary conditions to gather valid data for cases. Greener (2011:64) as well as Leedy and Ormrod (2010:101) identify some of the ethical issues that a researcher needs to be aware of, and also to inform the participants before they participate in the study:

- *Voluntary participation*: The participants will voluntarily participate and have every right to withdraw at any time from the research
- *No harm to the participants*: This research study does not require any form of experiments, in other words, it will not cause any harm to the participants
- *Anonymity*: This research will treat all the respondents as anonymous
- *Confidentiality:* This research will not identify any participants in any way
- *Deception:* This research will be conducted with honesty and truth; the participants must be informed what the research is meant for and what it expects to achieve
- *Beneficence*: The participating institutions will benefit from this research by using the outcome as a guide towards an effective implementation of an HRIS
- *Justice:* There will be equal distribution of risk and benefits among the participants, thus, no discrimination
- *Informed consent:* The participants will be informed of what the research is all about and they will decide if they want to participate
- *Right to privacy*: The participants will be given their right to privacy in this research

The researcher made sure that the mentioned issues were strictly complied with and informed consent was obtained from the authorities, as well as individual participants of the selected retail outlets.

3.8 Chapter summary

Chapter Three described the research philosophy and methods. A subjectivist and interpretivist stance were followed. The research strategy is that of a multiple case study. The units of analysis chosen from non-random, purposively sampling techniques were three tertiary library institutions in the Western Cape. The units of observation were individuals working within the libraries as managers and practitioners. Data was collected by means of interviews using semi-structured questionnaires. Data analysis was done by transcribing and validating the

transcription of the interviewees. The transcriptions were coded, and findings generated from the codes. The findings were categorised and then themes were developed from the categories.

Ethics as prescribed by the Cape Peninsula University of Technology were followed.

In Chapter Four, the findings of the research are discussed.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND THEMES

4.1 Introduction

The exponential growth in information production, the need for information and the changing technology environment are forces that academic libraries are facing on a daily basis. To manage the changing environment and the demands placed by users, libraries need to consider new ways of doing business. That is, libraries will most probably not survive if they do not adapt to, and adopt the use of electronic resources to meet business requirements.

4.1.1 Case study background

The research case study strategy followed was that of a multiple case study, using three libraries as indicated in Chapter Three (section 3.3.2). The libraries used in this research have been given pseudonyms and some details of the libraries are classified as highly confidential. These libraries are identified as Library A, Library B and Library C. This chapter starts with an introduction describing each library, followed by the findings as analysed from the interviews conducted. The background information contains a description of the electronic resources and collection management with some of the insights into their future intensions. What follows is based on interviews with fourteen staff members and senior managers: six (6) from Library A, three (3) from Library B and five (5) from Library C. The three case studies are summarised before continuing to analyse and present the findings.

4.1.2 Case Study One: Library A

The library started in 2005 and is the product of the merging of two libraries consisting of eleven branches throughout the Western Cape. The respondents were carefully selected according to their individual experience and individual role in the library. The library consists of two main branches and eight satellite branches around the Western Cape. The library's vision is "to be the heart of technology and innovation in Africa". The library understands education not only to be about the effective utilisation of technology, but sees its role as an application of knowledge for problem-solving and life skills to solve research problems, and to improve teaching. The library manages a wide variety of electronic resource material with 100 databases, 26 043 electronic books, 1106 electronic journals, 1169 e-theses and dissertations, and 2361 research outputs that include peer-reviewed articles, conference presentations, data-sets and theses. The library provides information literacy programmes to support research, teaching and learning. More than 2000 students receive literacy training per academic year. The library also offers an Information Literacy Certificate programme introduced

in 2013 in collaboration with the Centre for Continuous Education (CCE). The CCE, together with the library, manages the administration around the certification of information literacy. The library uses a webpage as the gateway to information.

4.1.3 Case Study Two: Library B

The library was established in 1959 and the new library opened in 1981. The library consists of a main library and a branch library in the dental faculty. The respondents of the library were selected according to their individual experience and individual role in the library. The mission of the library is to "support and enrich the university and its commitment to teaching, learning, research and community outreach by providing relevant resources, services, staff and an environment conducive to clients' exploring and acquiring knowledge". The library manages a wide variety of electronic resource material which includes 39 databases, 23 open access sources, 790 journals including print and electronic versions, as well as 3045 e-theses and 1287 research outputs that include peer-reviewed articles, conference presentations, data-sets, and more. The library offers information literacy training to students.

4.1.4 Case Study Three: Library C

This library was established in 1866 and has a strong cultural and historical heritage. The library consists of a central library with five branches, as well as some departments where collections are made. The respondents were selected according to their individual experience and roles in the library. The mission of the library is to "provide a world-class information service and learning space to the university community". The library manages a wide variety of electronic resources including 139 databases (1 234 270 full-text article downloads from the top 20 databases), 13 483 electronic books, 123 941 electronic journals, 5127 e-theses and dissertations, and 3587 research outputs that include peer-reviewed articles, conference presentations, data-sets and theses. The library provides face-to-face as well as virtual services to clients. The library is also responsible for information literacy training. Thus far 16 842 students did the group programme and 4294 students received individual training. The main goals and objectives of the library is to support, develop, and contribute to a high level of scholarly publication output, to partner with faculties in the development of information literacy skills, and to provide a cutting-edge information technology infrastructure to support technology, reach learning spaces, and address the needs of the user communities.

4.2 Problem statement

Libraries find it difficult to implement and maintain electronic resource management systems to meet their business requirements.

4.2.1 Primary research question

PRQ: How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

4.2.2 Sub-research questions

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

4.2.3 Aim

The aim of the research is to explore the challenges librarians are experiencing when implementing ERM systems.

4.3 Interviewees

As indicated in Chapter Three (section 3.3), the units of analysis are library employees (Table 4.1) managing or working with electronic resources.

Table 4.1: The Interviewees' level of management, years of experience and abbreviations

Interviewees	Experience	Abbreviation
Senior Management		
Library IT Manager	30 years	I1
Library Director Technical Services	25 years	I2
Aleph System Coordinator	27 years	I3
Middle Management		
Systems Librarian 1	13 years	I4
Systems Librarian 2	20 years	I5
Electronic Resources Librarian 1	25 years	I6
Electronic Resources Librarian 2	2 years	I7
Electronic Resources Librarian 3	15 years	I8
Faculty Librarian 1	8 years	I9
Faculty Librarian 2	25 years	I10
Faculty Librarian 3	18 years	I11

Interviewees	Experience	Abbreviation
Acquisitions Librarian 1	15 years	I12
Research Librarian 1	10 years	I13
Institutional Repository Librarian	20 years	I14

4.3.1 Senior Management

The senior management form part of the library executive management. The key role of senior management is to provide overall strategic leadership regarding all academic content information for the institution, and provide strategic management of all library delivery of its vision and mission. The senior management in the three libraries consist of the i) Library IT manager, ii) the Library Director: Technical Services, and iii) the Aleph System Coordinator. These three positions are discussed next.

4.3.1.1 Library IT Manager

Only one IT Manager out of three libraries from Library A was interviewed. Library B withdrew from the interview at the last minute and was replaced by the Library Director Technical Services, and the IT Manager of Library C was not available at the time of the interview and was replaced by the Acquisitions Librarian. The Library IT Manager plays a critical role in the management and access of electronic resources. The core duties are to ensure that all databases and systems are constantly monitored to ensure functionality and availability. A further role is to ensure that all problems and malfunctions are reported to the central desk and effectively solved. The Library: IT Manager needs to keep up with new trends in technology and systems evaluation, manage record-keeping malfunctioning and preventive actions, updating, replacement and enhancement of the system. They are also responsible for acting on all changes in database protocols and inform relevant parties accordingly.

4.3.1.2 Library Director: Technical Services

Only one Library Director: Technical Services from Library B was interviewed. The director replaced the Library IT Manager who withdrew at the last minute of the interview. The role of Library Director: Technical Services is to develop, manage, evaluate and maintain the library collection budget which includes physical and electronic resources. The Library Director: Technical Services needs to identify the assessment of the library print and electronic collection and gaps in the collection by using collection analysis tools, for example the World Share Analysis tool OCLC, and Ex Libris. The Library Technical Director needs to encourage librarians to attend external visits to book fairs, vendors, other libraries, information services and government departments in order to stay current with the latest trends and

developments in new technologies in the library environment. The Library Director: Technical Services works closely with Library Faculty Managers, Faculty Librarians, IT and Systems Librarians, Acquisition Librarians and Cataloguers, including the Electronic Resources Librarian who reports directly to the Director: Library Services.

4.3.1.3 Aleph System Coordinator

There is only one Aleph System Coordinator appointed for the Tertiary Institutions in the Western Cape South Africa. The role of the Aleph System Coordinator is to coordinate the management of the Aleph system centrally among the four tertiary institutions in the Western Cape which form part of CALICO (Cape Library Cooperative). The mission statement of CALICO is to "provide world class quality services to the clientele of the institution". The purpose is to optimally use all resources of the participating institutions, as well as external sources, maximise access to quality information services, and to develop partnerships where this will contribute to the needs of the users. CALICO reflects the vision of the mother body, CHEC (Council of Higher Education Consortium) of which CALICO is a project.

The Aleph system functions as a shared library information system which includes connectivity, administration, operating system, managing application, managing relationship with vendors, managing back-up and hosting. The Aleph System Coordinator reports directly to CHEC and meets monthly with the libraries to discuss Aleph system problems, system upgrades, testing, reviews and evaluations. It is important to interview the Aleph System Coordinator to establish if the Aleph integrated library system can integrate with the future ERM system and how the investigation of the next generation library will affect the Aleph system, which is expiring during 2017, and also whether the contract will be renewed or not, and if not, what kind of system will be replacing the Aleph system.

4.3.2 Middle Management

Middle Management report directly to the Library Senior Management and they support the operational function of the library. The key role of the middle management is to provide an effective service in a technical and user services environment, and to provide reference and research support services to all users. The middle management in the three libraries consist of i) Systems Librarians, ii) Electronic Resources Librarians, iii) Acquisition Librarian, iv) Faculty Librarians, v) Research Librarian, and vi) Institutional Repository Librarian. These six positions are now discussed.

4.3.2.1 Systems Librarians

Two Systems Librarians for Library A and C were interviewed, one from each library. Library B was represented by the Library Director: Technical Services. The Systems Librarian function is to manage and administer the Aleph integrated library system in collaboration with the Aleph System Coordinator. The Systems Librarians work closely with ICT, the Library IT manager, Electronic Resources Librarian and Faculty Librarian to ensure that the correct platform is used to access electronic resource databases, and that the databases are accessed optimally both on-campus and off-campus. The role of Systems Librarians is not for setting up, maintaining and administration of the platform. Electronic Resource Database Vendors play that role on behalf of libraries because each library pays for subscription and licensing agreement of databases such as EBSCO and Emerald. At all three libraries the Aleph system is under review for the next two years, as the Aleph contracts expire during 2017. The libraries are searching for the next generation library system, for example Alma Ex Libris, World Share OCLC and Sierra Millennium products with an ERM component to manage the electronic resources. The Systems Librarian reports directly to the library IT Manager. It is important to interview the systems librarians to determine if the current Aleph Integrated system can integrate with an ERM system for managing electronic resources.

4.3.2.2 Electronic Resources Librarians

Three electronic Resources Librarians were interviewed, one from each library. The functions of the electronic resources librarian include the acquisitions of electronic resources, creating awareness and marketing of electronic resources, workflow management, administration, licensing and subscription renewal, evaluation of electronic resources and statistical management. The Electronic Resources Librarian plays a significant role in the management of electronic resources. The functions of the electronic resources librarians increased in complexity because of the increase in electronic resources, as well as the demand of users accessing electronic resources databases. In all three libraries, each has only one Electronic Resources Librarian to manage the entire cycle of electronic resources and cannot cope with the increase in electronic resources. All three libraries use both the ALEPH system and traditional methods such as Excel spread sheet and in-house databases to manage electronic resources. They all subscribe to electronic resources and other online platforms through different vendors and suppliers, both national and international. While all the libraries acknowledge that electronic resource management is vital for their business activities, they still have not fully adapted to the ERM system introduced a decade

ago. They currently use both ALEPH and traditional methods e.g. Excel spread sheet, in-house databases etc. to manage electronic resources.

4.3.2.3 Acquisition Librarian

Only one Acquisition Librarian was interviewed (Library C), but the Acquisition Librarian withdrew from the interview and was replaced by the Institutional Repository Librarian. Library B was represented by the Director: Technical Services. The function of the Acquisition Librarian is mainly the acquisition of both print and single titles of electronic resources. The Acquisition Librarian works closely with the Electronic Resources Librarian in the acquisition of electronic resources. The Acquisition Librarian also works closely with faculty librarians in the collection, development and management of electronic resources, and booking of orders and journal subscriptions. It is important to interview the Acquisition Librarians to ascertain whether the decrease in print management and increase in electronic resource management affect staff workflow management, which results in staff working with print doing less, and Electronic Resources Librarians doing more tasks. The three libraries are moving towards the electronic environment and are in the process of cancelling all print journal subscription and replace them with electronic versions.

4.3.2.4 Faculty Librarians

In this case study three Electronic Resources Librarians were interviewed, one from each library. The Faculty Librarians are specialist information professionals. They assist with literature searches, provide research support, library training and develop the collection. It is important to interview this group because they are responsible for creating awareness and promotion of electronic resources. They are also responsible for Information Literacy Training on an individual basis or group training whereby users are trained to access library databases and other information resources. Faculty Librarians work closely with the Electronic Resources Librarian for electronic database subscription, renewals, trials, testing and demonstration of electronic databases, including access problems. They also work with the Systems Librarian and IT Manager on users having access difficulties both on campus and off campus. They work with the Institutional Repository Librarian throughout the system to develop, promote, and disseminate information about, and provide services that support the long term curation of the University Scholarly output in a range of media. Lastly, these librarians are responsible to liaise and collaborate with the faculties in terms of providing support in teaching and learning and research.

4.3.2.5 Research Librarian

Only one Research Librarian was interviewed from three libraries (C). The posts of Research Librarians at Libraries A and B were vacant during the period of the interview. The role of the Research Librarian is to analyse information requests to determine which materials will be best for researchers' needs. These librarians work closely with Faculty Librarians, and may work with outside groups or committees, for example Research Units, to determine the needs of research in the library, acquiring research books and other information materials. They also work closely with the Institutional Repository Librarian throughout the system to develop, promote and disseminate information about, and provide services that support the long-term curation of the University Scholarly output in a range of media. It was important to interview this librarian to distinguish their role in library research support, compared to the Faculty Librarians.

4.3.2.6 Institutional Repository Librarian

Only one Institutional Repository Librarian (Library A) was interviewed; Libraries B and C were not available during the period of the interview. The role of the Institutional Repository Librarian is to promote the growing Institutional Repository collection through collaboration with staff in the broader campus community about authors' rights and other issues related to scholarly communication. The Institutional Repository Librarian is responsible for managing the libraries' Institutional Repository services including D-Space, called Digital Knowledge platform, and reports directly to the IT Manager. The Institutional Repository Librarian works closely with ITS staff, the Scholarly Communication and Copyright Office, Research Office, Collection Development department, and the Faculty Librarians throughout the system to develop, promote, and disseminate information about, and provide services that support the long-term curation of the University Scholarly output in a range of media. It is important to interview the Institutional Repository Librarians as their responsibility is to manage one of the largest hosted platforms for electronic resources material, for example, theses, e-theses, dissertations and research outputs that include peer-reviewed articles, conference presentations, and data-sets. Lastly, the other role is to investigate technical problems and development of the Institutional Repository, including content management.

4.4 The Results

In this section the findings from the interviews are presented. The findings are shown in relation to the research as well as the interview questions related to them. The findings are discussed by first stating the RQ, then the SRQ followed by the IQ. The

IQ's answers are then discussed in the following order: i) Library IT manager, ii) the Library Director: Technical Services, iii) the Aleph System Coordinator, iv) Systems Librarians, v) Electronic resources Librarians, vi) Faculty Librarian, vii) Acquisition librarian, viii) Research librarian, and ix) the Institutional Repository Librarian. The responses of the interviews are given in Appendix A.

The primary research question is:

PRQ: How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

4.4.1 Sub-research question 1

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

4.4.1.1 Interview question 1.1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

I1 (Table 4.1 for abbreviations) stated that the Aleph ILS is designed to manage print and does not cope with the increasing number of electronic resources by saying that:

> "…we spend enormous amount[s] of money purchasing electronic resources, for example, our library spend[s] about 50% of the entire library budget on electronic resources, yet despite that we do not have [an] electronic resource management system. We spend huge amounts of money on other resources yet [the] Aleph system was designed to manage print resources, but does not do so effectively for electronic resources" (Appendix A, p.83).

Libraries are reluctant to purchase an ERM system because the current ILS Aleph system's contract is expiring in 2017. It is difficult to purchase a new system while the current system is under review. I1 further stated: "I think purchasing an ERM system will not be a good idea because [the] Aleph system is under review and its contract expires 2017, and it will not make sense to get a new system now" (Appendix A, p.83). I2 mentioned that the purchasing of electronic resources in libraries surpassed the purchasing of print resources:

> "…the importance of [the] collection budget in academic libraries has grown significantly, and if you look at the split in the budget of most academic institution[s], a majority of [the] budget goes to electronic resources, I think

> in most cases the split is 80% to electronic resources and 20% for print, and that changes all the time, but linked to that is the cost of these resources and [the] increase of these resources is a huge problem" (Appendix A, p.84).

I2 further indicated: "I think ERM system[s] can effectively manage electronic resources but there are technical challenges as well" (Appendix A, p.85).

Libraries are facing problems with copyright issues and intellectual rights of publishers regarding open access in accessing electronic resources. I3 stated that "the challenge that libraries are facing is complying with licensing regulations, copyright issues in relation [to] the management [of the] ERM system and intellectual property including open access" (Appendix A, p.86). I3 further stated that the vendors are frequently changing platforms, which results in the duplication and overlap of electronic databases subscriptions, and "duplication in the different collection[s] that you have, the vendors are always changes platforms" (Appendix A, p.86).

The ERM system plays an important role in the management of electronic resources in libraries. Two interviewees indicated that their libraries are currently experiencing drastic budget cuts as a result of the increase in electronic resources subscriptions. I4 said: "I do not think it will be a good decision to purchase an ERM system now, considering that the library is currently reviewing the current Aleph system, and also, looking from the financial side at the financial cost to buy the system has cost implications" (Appendix A, p.87). I4 further stated that "libraries are also not in a good position because of the decline of the rand value, and libraries have to prioritise on what we buy or not" (Appendix A, p.87).

Systems Librarians believe in the importance of having relevant experience and ICT skills to manage electronic resources. I5 said the following: "Another factor can be that staff are not familiar [with] these systems and the rapid change in technology, for example ERM systems means that the libraries are now looking at the Next Generation Library system with an ERM component to manage electronic resources" (Appendix A, p.88).

Electronic Resources Librarians support the Systems Librarians by emphasising the importance of having relevant experience and ICT skills needed to manage electronic resources. I6 said that "there is [a] lot of cost involved in purchasing ERM systems and require ICT skills to implement; we do not have experienced staff that specialise in these systems" (Appendix A, p.90). I7 supports I6 by saying that "cataloguing of electronic resources is a new trend in the field of librarianship, therefore cataloguing

librarians are not train[ed] in the new field, and need new skills in cataloguing electronic resources" (Appendix A, p.91).

The other factor that is seen as a frustration for staff managing electronic resources is the complications of the licensing agreement in the subscriptions of electronic resources. I8 stated that "the main challenge is the licensing agreements, cancellation and renewal of electronic resources and understanding the legal contracts of electronic resources subscription" (Appendix A, p.92).

Internet-connectivity and poor ICT infrastructure are factors affecting the access to electronic resources in libraries. Two out of three interviewees said that poor internet connection both on and off campus are the main barriers to access of electronic resources. I9 stated that:

> "…issues that we are currently [facing] are the internet connectivity which affect[s] the access of electronic resources on campus and off campus; we do receive calls from students of problems with access, for example Novell Login details to login and password[s] especially with newly registered students" (Appendix A, p.93).

I10 supports I9 that "internet connectivity and access to electronic resources is a challenge, especially after hours as the library is open until 12 pm midnight and there is no staff available to assist with access problems" (Appendix A, p.94). I11 said: "I think the cut of [the] collection budget and exchange rate, and the introduction of the new VAT Act on electronic resources has an impact on the purchasing of electronic resources" (Appendix A, p.95). I12 indicated that in most cases the IT team does not involve other library staff members when purchasing systems of software: "I think the purchase [of] ERM systems in libraries is done by the IT team without input from the rest of library staff, and after purchasing the system they discover that it is not aligned with institutional and Library strategy" (Appendix A, p.96). I12 further indicated that "I will not recommend the idea of ERM while they are still investigating the Next Generation Library; the current Aleph expires during 2017" (Appendix A, p.96). I13 stated that the current ILS Aleph system is becoming outdated and redundant and no longer copes with the management of electronic resources:

> "…I don't think it will be necessary to purchase an ERM system. We are currently looking at the Next Generation Library System with an ERM component to improve the management of electronic resources. The ALEPH system previously designed to manage more printed resources effectively,

and it is not coping with the management of electronic resources" (Appendix A, p.97).

I14 said that the cost of electronic resources subscription is the main factor influencing the acquisitions of ERM systems in libraries: "I think there is cost involved because of the increase of electronic subscription and the software is managed by a vendor or subscriber somewhere on cloud-based" (Appendix A, p.99).

Finding 1: 50% of the library budget is spend on purchasing ERM systems and database subscriptions of electronic resources; however, the current Aleph system is becoming outdated because it was previously designed to manage electronic resources

Finding 2: The review of the contract of the Aleph ILS makes it difficult for libraries to acquire a new ERM system

Finding 3: ERM systems are seen as an effective tool for the improvement of the management of electronic resources in libraries

Finding 4: 80% of the library collection budget is spend on electronic resources and 20% on print resources, and as a result affects library budgets because electronic resources subscriptions are more expensive than print resources

Finding 5: The licensing regulations, copyright issues and intellectual property rights are factors affecting the management of electronic resources in libraries

Finding 6: Collection management of electronic resources is seen as a challenge in electronic resources subscriptions due to vendors regular changing platforms which results in duplication and overlap of electronic resources subscriptions

Finding 7: Systems Librarians are of the opinion that staff lack ICT and technical experience in ERM systems in libraries

Finding 8: The high cost of ERM systems and the current review of the Aleph system are stumbling blocks when acquiring ERM systems

Finding 9: License restrictions and intellectual property and rights for publishers in the open access of electronic resources are stumbling blocks in the management of electronic resources

Finding 10: Poor internet connections and ICT infrastructure is a main barrier for accessing electronic resources

Finding 11: The lack of communication and staff involvement in purchasing ERM systems make it difficult to align the library and IT strategy

Finding 12: The current ILS Aleph system has become redundant and outdated and cannot effectively manage electronic resources

Summary of interviews (IQ1.1)

The Library IT Managers stated that 50% of the library budget is spent on purchasing ERM systems and database subscriptions of electronic resources. However, the current Aleph system is becoming outdated because it was previously designed to manage electronic resources. The libraries are reluctant to purchase the new ERM systems because the Aleph system is in the process of being reviewed and the contract expires during 2017. They also said that ERM systems are viewed as effective tools to manage electronic resources. This is supported by the Library Technical Services Director who emphasised that 80% of the library collection budget is spend on electronic resources and 20% on print resources. The library budget is affected because electronic resources subscriptions are more expensive than print resources, and further states that there are also technical challenges influencing the acquisition of ERM systems in libraries.

The Research Librarian indicated that the current ILS Aleph system in libraries has become redundant and no longer effectively manages electronic resources because it is designed to manage mostly print resources. The Library IT Manager agrees with the Systems Librarians that the high cost and current review of the Aleph system is a stumbling block for libraries to acquire ERM systems in libraries. The Systems Librarians and Electronic Resources Librarians also stated that library staff need both ICT and technical experience in ERM systems in managing electronic resources in libraries. The Acquisition Librarian argued that there is lack of communication between IT staff and library staff in making decisions on acquiring new systems like ERM, which makes it difficult for the library to align its strategy with the institutional one.

The Library Director: Technical services, Aleph Coordinator and Faculty Librarians regard management of electronic resources as a main factor influencing electronic resources subscriptions. The Aleph Coordinator and Electronic Resources Librarians agree that this factor is also influenced by the licensing regulations, copyright issues, intellectual property rights, and the management of electronic resources in libraries.

The Library Director Technical Services and the Aleph Coordinator view the collection of electronic resources as a challenge in electronic resources subscription. This is influenced by the introduction of the new Vat Act that that became effective in April 2014, which dictates that libraries will also pay VAT on electronic resources subscriptions. Although there are many factors influencing the acquisition and further implementation of the ERM system in libraries, Faculty librarians are still concerned about the poor internet connections and ICT infrastructure which they view as a main barrier for accessing electronic resources. The Library Director: Technical Services still believes that the ERM system is seen as an effective tool for the improvement of the management of electronic resources in libraries.

4.4.1.2 Interview question 1.2

IQ1.2: What kind of system are you using to manage electronic resources?

I1 stated that the library uses Excel spread sheets to manage electronic resources:

> "…the management of electronic resources is done by using Excel spread sheets, which is not a very efficient way. We need to look at acquiring an ERM system for the library because we spend a huge amount of money on electronic resources, but we do not have a system to properly manage these resources" (Appendix A, p.83).

Despite ERM systems being introduced in libraries a decade ago, libraries still use traditional platforms like Excel spread sheets to manage electronic resources. I2 indicated that they do not have the ERM system in place to manage electronic resources. Traditional platforms such as Excel spread sheets, with the combination of the current Aleph system, is used to manage electronic resources:

> "…we do not have [an] ERM system; we use the combination of [a] traditional platform like spread sheets with [the] Aleph system and Discovery tool which is called Smart Search; it is basically our OPAC. We use A-Z list and SFX link resolver for the access of databases and we have acquisitions and cataloguing modules on the system" (Appendix A, p.85).

I3 has no knowledge of an ERM system to manage electronic resources and indicated that "I have not worked on an ERM system and have no operational knowledge of this particular system" (Appendix A, p.86). I4 said that management of electronic resources is done manually with the combination of the Aleph system, and indicated that ERM systems can be a good platform to manage electronic resources:

> "A platform is needed to manage electronic resources; the current Aleph system does not have an ERM module platform to manage electronic resources; librarians rely on recording everything manually which is not a good idea for the management of electronic resources, but I know that Ex Libris have a platform of an ERM system called Verde, but I think it got financial implications so the library is currently not looking at acquiring new systems" (Appendix A, p.87).

I5 stated that:

> "...I know that Microsoft Excel document is used for storage and management of electronic resources; we also use SFX by Ex Libris link-resolver to convert the A-Z List databases into Full Text for easy access of electronic resources. As a Systems Librarian my role is also to do batch load electronic resources records into [the] Aleph system to make it discoverable through A-Z lists for access to electronic resources databases" (Appendix A, p.89).

I6 said that they do not have an ERM system to manage electronic resources and indicated that they use traditional platforms like Excel spread sheets and email folders to manage electronic resources:

> "We do not have an ERM system in place to manage electronic resources, but it can be an efficient way to store electronic information. We use Excel spread sheet[s] to store information like username, password, vendors contact details, licensing agreements; of course with our traditional ILS Aleph system, [we] sometimes store in e-mail folders and with the migration from GroupWise to Microsoft outlook the information was lost during the process" (Appendix A, p.90).

I7 and I8 support I6:

> "…we are using Ex Libris product Aleph which is our ILS system; the library at present does not have any home-grown, commercial or open source system to manage electronic resources; we use rudimentary forms [such] as Excel spread sheet, emails, personal folders on computers and network shared folders and those are primitive system[s]" (Appendix A, p.91).

I8 said that: “we use Excel spread sheet to manage electronic resources with the combination of the ALEPH system” (Appendix A, p.92). I9 stated that Aleph systems, with the combination of traditional platforms, are used in managing electronic resources: “We use Aleph system discovery tool and e-mail folders and Excel to store information of electronic resources” (Appendix A, p.93). I10 supports I9: “We use Aleph system discovery tools and in-house databases like traditional Excel spread sheet and e-mails” (Appendix A, p.94). I11 agrees with I9 and I10 by saying that “we do not work with an ERM system, we use Excel spread sheet” (Appendix A, p.95). I12 supports the previous interviewees: by stating that “we use the combination of the Aleph system and Excel spread sheet” (Appendix A, p.96); as well as I13: “…we do not work with an ERM system, we use Excel spread sheet” (Appendix A, p.98). I14 also uses traditional systems in the same way than the other librarians: “We use both a manual system and Aleph system to manage and store electronic resources like vendor details, licensing, renewals, cancellation, usage statistic and administration” *(*Appendix A, p.99).

Finding 13: Traditional methods such as Excel spread sheets combined with the Aleph system are used to manage electronic resources

Finding 14: There is awareness of ERM systems to manage electronic resources and it is regarded as an effective tool to improve the management of electronic resources

Finding 15: The Aleph System Coordinators as well as Faculty Librarians have no knowledge of ERM systems to manage electronic resources

Summary of interviews (IQ1.2)

All interviewees use traditional methods like Excel spread sheets with the combination of the Aleph system to manage electronic resources, despite the introduction of ERM systems a decade ago. The Library IT Manager, the Director: Technical Services as well as Systems and Electronic Resources Librarians are aware of ERM systems to manage electronic resources and it is regarded as an effective tool to improve the management of electronic resources. The Aleph Coordinator and Faculty Librarians are not aware of current ERM systems to manage electronic resources. All three libraries use traditional platforms like Excel spread sheets, e-mail folders and in-house databases to store vendor information for electronic resources subscriptions, such as vendors’ personal details, licensing information, statistical usage and other administration. Electronic Resources Librarians mentioned that it is important to have one platform or an ERM system in place that can integrate with the current ILS Aleph

system, to prevent data loss due to system migration. For example, data was lost on an e-mail folder due to the migration of GroupWise to Microsoft outlook in one of the libraries interviewed.

4.4.1.3 Interview question 1.3

IQ1.3: Can the current Aleph System integrate with an ERM system?

I1 indicated that the current Aleph system can integrate with an ERM system depending on the architecture of the system, and that the library is also looking at a new system that can integrate with the Library Finance System:

> "Aleph can integrate with an ERM. At the moment we are looking at the Next Generation Library System as well as different products. At this stage we are definitely looking at the kind of system that can integrate with other campus functions like [the] finance system, administration. It must be built from the latest architecture and be able to integrate with other systems" (Appendix A, p.83).

I2 supports I1 that Aleph can integrate with an ERM system but the challenge is that libraries have not adopted ERM systems to manage electronic resources:

> "I think Aleph can integrate with an ERM system, however an additional software such as the link resolver and discovery tools like primo have been acquired, therefore [an] ERM system like Verde from Ex Libris has been developed and they can integrate with particular ILS systems, but libraries have not yet adopted those systems because of technical issues" (Appendix A, p.85).

I3 agrees with I1 and I2 that the Aleph system can integrate with an ERM system depending on the system architecture and technical support:

> "The four Institutions in CALICO use Aleph ILS. Aleph cannot manage electronic resources because it is not an ERM system. ERM systems are design to manage functions like licensing agreements, contract management, authorisation, authentication and technical issues; Aleph can integrate [with] an ERM system but technical assistance is needed to work on the interface and that which can cost libraries a lot of money, therefore Aleph can integrate with ERM depending on the system architecture" (Appendix A, p.86).

I4 supports the previous interviewees that the Aleph system can integrate with an ERM system; however, due to the Aleph system's contract ending in 2017, it is currently difficult for the library to acquire an ERM system:

> "Aleph can integrate with an ERM; as I mentioned earlier a platform such as Verde can improve the management of electronic resources, however, considering that [the] contract of the current Aleph system is expiring at the end of 2017 [it] is not recommended that the library acquire an ERM system" (Appendix A, p.88).

I5 is of the opinion that Aleph can integrate with an ERM system and indicated that the library is investigating a new system to better manage electronic resources: "I think it is possible for Aleph to integrate with an ERM system but the library is currently investigating the Next Generation Library system in collaboration with CALICO Consortium like QUALI, an open source system, OCLC World Share and Alma from Ex Libris" (Appendix A, p.89). I6 disagrees with the previous interviewees by arguing that it is not possible for the current Aleph system to integrate with an ERM system: "I do not think it is possible for the current ILS which is Aleph to integrate with an ERM system because there is no proper ICT infrastructure to support the new ERM system" (Appendix A, p.90). However I7 agrees with I1:

> "It is definitely possible to integrate the current ILS with an ERM system; however, the system cannot integrate with the Library Finance System which is needed for the acquisition of electronic resources; there is also [a] technical reasons for the system not to integrate with the institution['s] ITS system for online purchasing of electronic resources" (Appendix A, p.91).

I8 stated: "I do not think Aleph can integrate with an ERM system because it was originally developed to manage print material rather than electronic resources" (Appendix A, p.92).

The three Faculty Librarians interviewed have no knowledge of available ERM systems to manage electronic resources. I9 said that "I do not work with an ERM system; as a Faculty Librarian I only use the discovery tool platform. The Systems Resources Librarian will be able to give more details on this question" (Appendix A, p.93). I10 supports I9 by saying that "I have no technical experience with the Aleph system; the IT manager looks at [the] technical side of the system, reviews and upgrades of the system" (Appendix A, p.95). I11 agrees with I19 and I10: "I don't have an idea; the Systems Librarians work with the technical issues of the system" (Appendix A, p.98). I12 agrees with I1 and I7 that Aleph can integrate with an ERM system but there is lack of integration with the institutional ITS system and Library Finance System. I12 is of the opinion that the "Aleph system can integrate with an ERM system but not fully because of the lack of integration of the Library Finance System; if your ILS is compatible you can experience problems" (Appendix A, p.97).

I13 shares the same opinion as that of the Faculty Librarians that he has no knowledge and technical experience of ERM systems. I14 agrees with I9 that it is not possible for Aleph to integrate with an ERM system but it can be an effective tool for managing electronic resources:

> "I do not think [the] Aleph system can integrate with an ERM system; it will be good to have such system but in my case as an Institutional Repository Librarian it will make it easy to manage the Institutional repository which is open access and cloud based, so obviously the new system need[s] to meet those requirements" (Appendix A, p.99).

Finding 16: The Aleph system can integrate with an ERM system, however, there is lack of integration between ERM systems with the Library Finance System for purchasing of electronic resources

Finding 17: Libraries are not adopting ERM systems

Finding 18: The high cost of ERM systems makes it difficult for the libraries to acquire them

Finding 19: It is difficult for the library to acquire an ERM system due to the Aleph system contract ending in 2017

Finding 20: The Aleph system cannot integrate with an ERM system; there is no proper ICT infrastructure to support the new ERM system

Finding 21: There is lack of integration between ERM and Library Finance System

Finding 22: There are some librarians with little or no knowledge of ERM systems to manage electronic resources

Summary of interviews (IQ1.3)

The Faculty Librarians and Research Librarian interviewed have no knowledge of ERM systems to manage electronic resources in libraries. The Library IT Manager agrees with one of the Electronic Resources Librarian (I7) and the Acquisitions Librarian that ERM systems can integrate with the Aleph system. However, they pointed out that there is still lack of integration between ERM systems with the Library Finance System for purchasing of electronic resources. The Technical Service Director indicated that despite ERM systems being introduced a decade ago libraries have not yet adapted to these systems.

The Electronic Resources Librarian (I8) argued that the reason Aleph cannot integrate with an ERM system is that the Aleph system was designed to manage print material rather than electronic resources. The Electronic Resources Librarian (I6) indicated that a proper ICT infrastructure is needed for full integration of ERM systems with the Aleph system. The Aleph Coordinator agrees with the previous interviewees and stated that the high cost of ERM systems makes it difficult for the libraries to acquire them. The Systems Librarians stated that Aleph can integrate with ERM systems, however due to the Aleph system contract ending in 2017 the libraries are reluctant to purchase an ERM system. Furthermore, the libraries are not in a good financial situation because they are investigating new systems, called the Next Generation Library system to improve the management of electronic resources. The Institutional Repository Librarian further argued that it is not possible for an ERM system to integrate with the Aleph system, but agrees that it can be an effective tool that can be used to improve the management of electronic resources.

4.4.2 Sub-research question 2

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

4.4.2.1 Interview question 2.1

IQ2.1: What issues and challenges are libraries facing in the utilisation and management of electronic resources?

I1 stated that licensing agreements, copyright and intellectual property are some of the issues affecting the management and utilisation of electronic resources. The access of electronic resources due to poor internet connectivity is one of the technical barriers in accessing electronic resources, especially during training of library users in accessing the databases and other electronic resources:

> "There are different types of licensing agreement[s] for the management of electronic resources, there is also intellectual property rights and copyright issues for publishers, and lastly library users access electronic resources in different platforms or databases, therefore there [are] access problem[s] due to poor internet connection, especially during the training of library users to access the library databases" (Appendix A, p.84).

I2 is of the opinion that staff need to keep up with the latest trends in the managing of electronic resources:

> "I do not think the staff [are] reluctant in using newer technologies in electronic resource management, but the problem lies with keeping themselves abreast with the latest trends in managing electronic resources, which can be done by researching, benchmarking and sharing best practices with other institutions for future development of ERM systems" (Appendix A, p.85).

I3 supports I1 by indicating that poor internet connectivity makes it difficult for library users to access electronic resources, and further indicates that intellectual property rights for publishers because of vendors changing platforms, is also a challenge for the management and utilisation of electronic resources:

> "Technological barriers [are] one of the challenges; poor internet connection makes it difficult for users to access electronic resources, for example, on campus and off campus access needs authentication through passwords, and support from ICT staff is needed all the time; another problem is the issue of ownership or intellectual property rights because vendors change platforms all the time which make it difficult for the user to have access all the time they need information on the databases" (Appendix A, p.86).

I4 stated that although ERM systems in libraries were introduced a decade ago, libraries continue using traditional methods to manage electronic resources, and it will be a challenge to acquire an ERM system that can integrate with the current Aleph system:

> "I think that the library has decided to currently focus on managing electronic resources on traditional system[s] such as Microsoft Excel and other traditional platforms; from a systems librarian perspective I think the challenge will be to purchasing an ERM system that can integrate with the current Aleph system" (Appendix A, p.88).

I5 mentioned that there is a lack of staff skills and experience in working with ERM systems in libraries and further stated that there is lack of integration of the Aleph system and ERM systems because the Aleph system was previously designed to manage print:

> "If we look at ERMS in libraries it is clear that library staff do not have experience with ERM systems. I think the systems are difficult to operate, there is also lack of integration with the current ILS; licensing agreements and information security is a concern because the system is cloud-based. Previously the Aleph system was developed to manage print resources and need[s] to be upgraded to manage electronic resources" (Appendix A, p.89).

I6 mentioned that “the challenge is the high increase [in the] cost [of] ERM systems and the library has [a] limited budget to purchase new systems, taking into consideration the current financial situation of libraries” (Appendix A, p.90). I7 agrees with I1 and I3 that off campus access, including copyright and license negotiations, makes the management and access of electronic resources difficult. I7 further indicated that there are inadequate staff managing electronic resources:

> “The processes of electronic resource management include several functions in the library, like cataloguing, acquisitions and the discovery tool; the challenge is that only one Electronic Resources Librarian is responsible for the entire process of electronic resource management; the second challenge is the access of electronic resources, as off campus access is tricky to manage for a variety of reasons, and legal aspects around copyright issues including license negotiations of electronic” (Appendix A, p.91).

I8 stated that there is a low usage of electronic resources by library users. This makes it difficult for the library to motivate renewal of database subscriptions which results in some databases being cancelled: “The challenge is the drastic cut of budget [in the] current financial situation, and secondly, the current usage of electronic resources is very low which make[s] it difficult to motivate whether to renew or cancel a database due to increase [in the cost] of electronic resources subscriptions” (Appendix A, p.93). I9 supports I8 by indicating that low usage and the marketing of electronic resources databases in libraries is another big challenge faced by libraries. I9 further indicated that the lack of participation and collaboration with lecturers on training users in accessing electronic resources results in a low usage of library electronic resources databases:

> “The challenge we [are] facing is low usage and marketing electronic resources, and lecturers [who] do not encourage students to use electronic resources; another challenge is that the time allocated by lecturers for faculty librarians to conduct training for students on accessing databases and other electronic resources material is limited; some lecturers refuse to participate and allow students to train” (Appendix A, p.94).

I10 is of the opinion that the introduction of value-added tax on libraries and the fluctuating exchange rates are factors that cause libraries to cancel or not renew electronic resources databases: “The introduction of the VAT Act that libraries must also pay VAT on electronic resources subscription[s] effective from 2014 by the National Treasury, are factors affecting the utilisation and access of electronic resources in libraries; this results in libraries cancelling or not renewing subscription of electronic resources that are underutilised” (Appendix A, p. 96). I11 is of the opinion

that staff need to keep up with the latest trends in managing electronic resources and new technologies:

> "I think of the rapid increase and the high cost of electronic resources, and it also difficult for staff to keep up with the latest trends and developments in technology and the new system. Off campus access is also a problem and an unstable network is a challenge in accessing electronic resources off campus."

I12 indicates that staff need ICT skills and a stable network to support the accessibility and use of electronic resources:

> "Staff need to have ICT skills and a lot of IT support is needed to make the electronic resources accessible to the users. Good ICT infrastructure is needed because it is difficult to manage electronic resources if you do not have a stable network. Unstable networks make [it] difficult for the access and utilisation of electronic resources" (Appendix A, p.97).

I13 agrees with I11 and 12 that staff need to keep up with the latest trends in managing electronic resources and new technology:

> "High cost[s] and [the] rapid development increase in managing electronic resources makes it difficult for staff to keep up with the latest trends in the access of electronic resources. For example, platform changes and the issue of copyright is a challenge. We were using the platform called RefWorks for referencing and now it is replaced by Mendeley; off campus access is always problematic because of unstable network" (Appendix A, p.98).

I14 agrees with I1 that copyright and intellectual property rights for publishers are a legal factor affecting the utilisation and access of electronic resources: "…our institution use[s] a platform called Digital Knowledge to manage the repository; it has its own problems and implications, for example, legal issues such as Copyright, Intellectual Property rights for publishers on Open Access control" (Appendix A, p.99).

Finding 23: Poor internet access and connectivity are two of the technical barriers to the access of electronic resources

Finding 24: The licensing agreement and copyright, including intellectual property rights for publishers, are some factors affecting the accessing of electronic resources

Finding 25: The library staff are not advancing their own development and are struggling to keep up with new trends in managing electronic resources

Finding 26: The future development of ERM systems in libraries relies on library employees keeping up with the latest trends in managing electronic resources

Finding 27: Libraries are still using traditional methods for management of electronic resources despite the introduction of ERM systems

Finding 28: The staff managing electronic resources have no knowledge and experience of ERM systems in libraries

Finding 29: There is lack of staff managing electronic resources, resulting in inadequate distribution of tasks among staff managing electronic resources

Finding 30: There is a lack of usage of the electronic resources databases subscribed by libraries, as well as limited budgets resulting in some databases been cancelled or not renewed

Finding 31: There is a lack of lecturers' participation and collaboration with the library in training users to access library databases

Finding 32: The introduction of Value Added Tax on libraries is a factor affecting the cancellation of subscriptions or the non-renewal of electronic resource databases

Summary of interviews (IQ2.1)

The Library IT Manager, Library Director: Technical Services, the Institutional Repository Librarian, the Electronic Resources Librarian and Aleph Coordinator all agreed that the licensing agreement, copyright and intellectual property are some of the issues affecting the management and utilisation of electronic resources. They also highlighted that poor internet access and connectivity were technical barriers in the access and utilisation of electronic resources. There were different opinions regarding staff managing electronic resources in libraries. The Systems Librarians are of the opinion that staff managing electronic resources have no knowledge and experience of ERM systems in libraries, whereas the Faculty Librarians and Research Librarian state that the library staff are responsible for their own development and keeping up with the new trends in managing electronic resources, and researching new

technologies in their environment. The Electronic Resources Librarians stated that there is a lack of staff managing electronic resources because in all three libraries interviewed there is only one Electronic Resources Librarian to manage electronic resources, which results in tasks not adequately distributed to other staff involved in the process of managing electronic resources. They further stated that the high cost of ERM systems makes it difficult for the libraries to purchase ERM systems due lack of finance.

The Acquisition Librarian stated that in order for staff to be effective and efficient in electronic resource management, they need ICT skills and a stable network to improve the access of electronic resources. However, Systems Librarians argue that the libraries are still using traditional methods for the management of electronic resources despite the introduction of ERM systems, and there is still lack of integration of the Aleph system with ERM systems because Aleph was previously designed to manage print. Finally, the Faculty Librarians indicated that the introduction of VAT on electronic resources subscriptions for libraries affects the access and utilisation of electronic resources. They also indicated that there is lack of usage of electronic resources databases subscribed by libraries due to lack of lecturer participation and collaboration with the library in training users to access library databases.

4.4.3 Sub-research question 3

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

4.4.3.1 Interview question 3.1

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

I1 stated:

> "It is necessary to make sure that your ERMS [is] built on national [standards] and be able to integrate with other systems globally, for example one of the standards used is called SOAP (Standard Object Access Protocol) [which] facilitates the exchange of information between different applications" (Appendix A, p.84).

According to I2:

> "I am aware of the standards and it is important to look at both national and international standards of electronic resource management, I know of [the] Digital Library Federation report which includes electronic resource management initiatives; it gives guidelines for library vendors and publishers, for example, the federated search system which make[s] it possible to search various database[s], the same standards have to be applicable for all ERM system[s] to be able to harvest metadata data to retrieve statistical usage, cost per downloads to avoid duplication and overlap of databases" (Appendix A, p.85).

I3 is of the opinion that there are no particular standards available for electronic resource management: "I do not know if there is a particular electronic standard, but of course there are data coding standards, metadata coding standards, there are issues about their way of working in terms of managing licenses and other authentication" (Appendix A, p.87). Two of Systems Librarians interviewed are not aware of standards in electronic resource management. I4 responded: "I am not aware of standards on electronic resource management" (Appendix A p.88). One systems Librarian is of the opinion that standards can improve interoperability of the system through collaboration and sharing among libraries.

I5 is aware of the standards in electronic resource management and their importance in improving collaboration among libraries:

> "...I know there are standards in place to improve the interoperability of the system to improve sharing and collaboration in libraries; the DLF (Digital Library Federation) and NISO have ERM initiatives that are standard for a workflow in an ERMS, and they have a dictionary in an XML schema" (Appendix A, p.89).

Two of the Electronic Resources Librarians interviewed are not aware of available standards for managing electronic resources. I7 is aware of standards available in electronic resource management and indicates that "there is ERMi (electronic resource management initiatives) of the Digital Library Federation which is DLF, and the DFL report 2004 has provided commercial vendors with a blueprint for development by noting functional specification and best practices for ERM systems" (Appendix A, p.91). I8 said: "…I have been in this position as Electronic Resources Librarian for over a year now so the whole business of electronic resource management is new to me; I do not have knowledge of any standards" (Appendix A, p.93).

The Faculty Librarians are not aware of standards in electronic resource management. I9 stated that "I have no knowledge of standards; the Electronic Resources Librarian work[s] with the standards" (Appendix A, p.94). I10 mentioned that:

> "I am not aware of any available standards; the Electronic Resources Librarian's job portfolio is to research and look at available standards for managing electronic resources; currently CALICO shares the Aleph system and inter-library loans and [I] think this platform can share best practices and standards in the management of electronic resources" (Appendix A, p.95).

I11 said: "I am not aware of any available standards" (Appendix A, p.96). I12 is also not aware of standards in electronic resource management and responded: "I am not aware of standards but I think attending conferences is good for networking where best practices and standards in managing electronic resources can be shared among libraries" (Appendix A, p.97). I13 too was not aware: "I am not aware of any standards in place in managing electronic resources" (Appendix A, p.98). Likewise I14 said: "I don't have an idea of available standards in electronic resource management" (Appendix A, p.99).

Finding 33: The librarians are not aware of available standards for electronic resource management

Summary of interviews (IQ3.1)

10 out of 14 interviewees interviewed are not aware of current standards available in the management of electronic resources. The interviewees included the Aleph Coordinator, one Systems Librarian, two Electronic Resources Librarians, three Faculty Librarians, an Acquisitions Librarian, Research Librarian and Institutional Repository Librarian. The Library Director: Technical Services, Systems Librarian and Electronic Resources Librarian are aware of standards in managing electronic resources and stated that the standards available are DLF (Digital Library Federation) and NISO. They have ERM initiatives that are standard for a workflow in ERM systems in order to improve the interoperability of the system and improve sharing and collaboration in libraries. The Library IT Manager is also aware of standards in electronic resource management, and the national and international standards will enable integration of ERM systems.

4.4.3.2 Interview question 3.2

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

I1 as well as I2 stated that the role of the consortium is to improve standards, collaboration and resource sharing and further stated that CALICO shares the Aleph system as the Library Integrated System. I2 elaborated:

> "I think local collaboration is important, for example, CALICO plays a vital role in the four institutions in the Western Cape, South Africa. There was an initiative of forming the acquisition forum among the four universities where best practices can be learned in the purchasing or acquisitions of electronic resources. SANLIC also plays an important role in the negotiations of licensing and pricing of electronic resources among libraries in South Africa" (Appendix A, p.86).

I5 supports I2 that a consortium is important for collaborating, resource sharing and negotiating licenses for the purchase of electronic resources:

> "..I think if we have purchased an ERM system in South Africa we can benefit not only from sharing and collaborating in having an ERM system in libraries, but also we can share the same standards. Collaboration is currently done through [the] CALICO Consortium with Aleph Resource sharing; SANLIC negotiate licenses and lower [prices] for purchasing electronic resources" (Appendix A, p.89).

I6 is in support of I2 and I5 that a consortium is important for collaboration, resource-sharing and negotiating licenses for the purchase of electronic resources: "I think consortia like SANLIC plays [sic] an important role; it represents all the academic and research libraries in South Africa to negotiate pricing and licensing of electronic resources on their behalf to negotiate better deals" (Appendix A, p91). I7 indicated that a consortium is important for collaboration by stating that "collaboration is necessary; in addition, there are other important consortium [sic] in South Africa besides CALICO that is [sic] strong in electronic resource management" (Appendix A, p.92). I8 contributed towards the discussion: "I think definitely [it] is good to have a platform where everything can be discussed" (Appendix A, p.93). I9 indicated that "consortia is [sic] good for collaboration, networking and sharing best practices with other libraries" (Appendix A, p.94). I10 stated that "the role of consortia is to improve collaboration and sharing best practices and standards in the management of electronic resources. Currently CALICO shares the Aleph system and interlibrary loans" (Appendix A, p.95).

I11 is of the opinion that "the role of consortia is to improve collaboration and resource sharing among libraries" (Appendix A, p.99). I3 agrees that:

> "Consortia [are] important for sharing material through shared collection development strategies and human resource management strategies; CALICO's role is to give the same library services and provision of information resources experience to registered students regardless of which tertiary institution they are enrolled at in the Western Cape" (Appendix A, p.87).

The consortium can also play an important role in the benchmarking of ERM systems for libraries. I4 argued that "CALICO need[s] to look at benchmarking with other consortia in other provinces outside the Western Cape, like SEALS in the Western Cape and GAELIC in Gauteng Province use different traditional integrated systems with a built ERM system like SIERRA" (Appendix A, p.88). I12 stated that consortia are important in building collaboration and relationship among libraries: "It is good in building collaboration and relationship among libraries; currently with CALICO the four institutions in the Western Cape South Africa have a shared system, Aleph system, including inter-library Loans as resource sharing tool" (Appendix A, p.97). I13 supports I9, I10, I11 and I12 that consortia are important for collaboration, resource sharing and sharing best practices and standards of electronic resource management: "The four institutions can collaborate more as CALICO libraries, not only about Aleph system and inter-library Loans but also sharing best practices and standards in terms of managing e-resources" (Appendix A, p.98).

Finding 34: The roles of consortia are important to improve standards, collaboration and resource sharing of electronic resources among libraries

Finding 35: Consortia play a role in the collaboration and price negotiations of the acquisitions of electronic resources

Finding 36: The consortium is important for benchmarking among libraries nationally

Summary of interviews (IQ3.2)

Five (5) of fourteen (14) interviewees stated that the roles of consortia are important for collaboration, resource sharing and sharing best practices among libraries. The interviewees include three Faculty Librarians, one Electronic Resources Librarian and the Research Librarian. Four (4) of fourteen (14) interviewees indicated that the consortium plays a role in the collaboration and price negotiations of the acquisitions of electronic resources. They all agree that although CALICO plays a role in resource sharing of the Aleph system and inter-library loans, SANLIC also plays a vital role

nationally for negotiations for better pricing in the purchase of electronic resources, including licensing agreements.

The interviewees included the Library Director: Technical Services, one Systems Librarian, as well as the two Electronic Resources Librarians. Four (4) of the fourteen (14) interviewees stated that the role of consortia is important to improve standards, collaboration and resource sharing of electronic resources among libraries. The interviewees include the Library IT Manager, Aleph Coordinator, Acquisitions Librarian and the Institutional Repository Librarian. Finally, one Systems Librarian interviewed stated that the consortia are important for benchmarking among libraries nationally.

4.5 Themes developed from the findings

The following themes were developed from the findings (Table 4.1 shows the themes linked to the findings, interview questions and sub-research questions). The themes are: i) costs; ii) Legal requirements; iii) knowledge and training; v) legacy systems; vi) Infrastructure; vii) ERM standards; viii) Alignment and integration of strategies and systems; and ix) collaboration.

Table 4.2: The themes developed from findings

Themes	Findings Number	Findings	SRQ
Costs	Finding 1	50% of the library budget is spent on purchasing ERM systems and database subscriptions of electronic resources; however, the current Aleph system is becoming outdated because it was previously designed to manage electronic resources	SRQ1 IQ1.1
	Finding 4	80% of the library collection budget is spent on electronic resources and 20% on print resources, and as a result affects library budgets, because electronic resources subscriptions are more expensive than print resources	SRQ1 IQ1.1
	Finding 8	The high cost of ERM systems and the current review of the Aleph system are stumbling blocks when acquiring ERM systems	SRQ1 IQ1.1
	Finding 18	The high cost of ERM systems makes it difficult for the libraries to acquire them	SRQ1 IQ1.3

Themes	Findings Number	Findings	SRQ
	Finding 30	There is a lack of usage of the electronic resources databases subscribed by libraries, as well as limited budgets, resulting in some databases being cancelled or not renewed	SRQ2 IQ2.1
	Finding 32	The introduction of Value Added Tax on libraries is a factor affecting the cancellation of subscriptions or the non-renewal of electronic resource databases	SRQ3 IQ2.1
Legal requirements	Finding 2	The review of the contract of the Aleph ILS makes it difficult for libraries to acquire a new ERM system	SRQ1 IQ1.1
	Finding 5	The licensing regulations, copyright issues and intellectual property rights are factors affecting the management of electronic resources in libraries	SRQ1 IQ1.1
	Finding 9	License restrictions and intellectual property and rights for publishers in the open access of electronic resources are stumbling blocks in the management of electronic resources	SRQ1 IQ1.1
	Finding 19	It is difficult for the library to acquire an ERM system due to the Aleph system contract ending in 2017	SRQ1 IQ1.3
	Finding 24	The licensing agreement and copyright, including intellectual property rights for publishers, are some factors affecting the accessing of electronic resources	IQ2.1
Knowledge and training	Finding 6	Collection management of electronic resources is seen as a challenge in electronic resources subscriptions due to vendors regularly changing platforms which results in duplication and overlap of electronic resources subscriptions	SRQ1 IQ1.1
	Finding 7	Systems Librarians are of the opinion that staff lack ICT and technical experience in ERM systems in libraries	SRQ1 IQ1.1
	Finding 15	The Aleph System Coordinators as well as Faculty Librarians have no knowledge of ERM systems to manage electronic resources	SRQ1 IQ1.2
	Finding 22	There are some librarians with little or no knowledge of ERM systems to manage electronic resources	SRQ1 IQ1.3
	Finding 25	The library staff are not advancing their own development and are struggling to keep up with new trends in managing electronic resources	SRQ2 IQ2.1
	Finding 26	The future development of ERM systems in libraries relies on library employees keeping up with the latest trends in managing electronic resources	SRQ2 IQ2.1
	Finding 28	The staff managing electronic resources have no knowledge and experience of ERM systems in libraries	SRQ2 IQ2.1
Legacy systems	Finding 12	The current ILS Aleph system has become redundant and outdated and cannot effectively manage electronic resources	SRQ1 IQ1.1

Themes	Findings Number	Findings	SRQ
	Finding 13	Traditional methods such as Excel spread sheets combined with the Aleph system are used to manage electronic resources	SRQ1 IQ1.2
	Finding 27	The libraries are still using traditional methods for management of electronic resources, despite the introduction of ERM systems	SRQ2 IQ2.1
Infrastructure	Finding 10	Poor internet connections and ICT infrastructure is a main barrier for accessing electronic resources	SRQ1 IQ1.1
	Finding 23	Poor internet access and connectivity are two of the technical barriers to the access of electronic resources	SRQ2 IQ2.1
ERM standards	Finding 33	The librarians are not aware of available standards for electronic resource management	SRQ3 IQ3.2
	Finding 34	The roles of consortia are important to improve standards, collaboration and resource sharing of electronic resources among libraries	SRQ3 IQ3.2
Integration and alignment of systems and strategies	Finding 3	ERM systems are seen as an effective tool for the improvement of the management of electronic resources in libraries	SRQ1 IQ1.1
	Finding 16	The Aleph system can integrate with an ERM system, however, there is lack of integration between ERM systems with the Library Finance System for purchasing of electronic resources	SRQ1 IQ1.3
	Finding 20	The Aleph system cannot integrate with an ERM system; there is no proper ICT infrastructure to support the new ERM system	SRQ1 IQ1.3
	Finding 21	There is lack of integration between ERM and the Library Finance System	SRQ1 IQ1.3
Collaboration	Finding 31	There is a lack of lecturers' participation and collaboration with the library in training users to access library databases	SRQ2 IQ2.1
	Finding 35	Consortia play a role in the collaboration and price negotiations of the acquisitions of electronic resources	SRQ3 IQ3.2

These themes are linked to the research questions and discussed in Chapter Five, which is a discussion of the findings. Themes are discussed in relation to the research questions applicable to the themes.

CHAPTER FIVE: DISCUSSION OF FINDINGS

The aim of the research is to explore the challenges librarians are experiencing when implementing ERM systems. Libraries find it difficult to implement and maintain electronic resource management systems to meet their business requirements. In order to explore the problem statement, the following research question was asked: **How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?**

In this chapter, themes developed from Chapter Four are discussed.

5.1 Themes developed

From the findings, and after categorising the findings, eight themes were developed (Table 4.1). The themes are: i) costs; ii) legacy systems; iii) alignment and integration of strategies and systems; iv) knowledge and training; v) infrastructure; vi) collaboration; vii) legal requirements; and viii) ERM standards. The themes are discussed in terms of the SRQs.

5.1.1 Costs

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Although ERM systems are regarded as an effective tool for the improvement of the management of electronic resources in libraries, the majority of staff in libraries are still experiencing difficulties in purchasing ERM systems to manage electronic resources. The high cost of technology is the main factor affecting the acquiring of ERM systems in libraries to effectively manage electronic resources. The global financial crisis results in libraries facing severe budget cuts while the cost of hardware and software maintenance, as well as software licensing, continues to rise. To add to this hostile environment, technology adopted by ILS was developed more than ten years ago and is evidently outdated (Fu & Fitzgerald, 2013).

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

The lack of budget and high growth in electronic resources collection make it complex for librarians to manage electronic resources. The result is supported by Fu and Fitzgerald (2013), Ryder and Leue (2012), and Collins and Grogg (2011) who state

that the inability to adapt and cope with the challenges to the growing collections of electronic content, results in the failure to implement, as well as benefits of implementing of ERM systems.

5.1.2 Legacy systems

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

As the migration from print to electronic resources took place, ERM systems were introduced a decade ago. The role of libraries was to select and deploy various ERM systems to assist them in managing the complexities of electronic resources, including the facilitation of user access. The purpose was to enable librarians to maximise workflow improvements derived from ERMS implementation, and adjust processes to accommodate aspects of electronic resources in order to gain more value from the systems and tools that handle electronic resources.

The findings indicate that three libraries use legacy and traditional ILSs for management of electronic resources, despite the introduction of ERM systems. Collins and Grogg (2011) argue that the complexity of ERM is often underestimated by those not deeply involved with the systems. Fieldhouse and Marshall (2012) indicate that the ILS aims to provide an electronic version of the card catalogue, and to automate the function of the library, including physical material. Those systems are centred on print media and established the basic model for a computerised bibliographic system, as well as making great effort at creating standards. It is clear from the findings that the current ILS has become redundant and outdated and cannot effectively manage electronic resources, because it was previously developed to manage print resources (Fu & Fitzgerald, 2013).

5.1.3 Alignment and integration of strategies and systems

SQR1: What are the main factors affecting the implementation of ERM systems in libraries?

ERM systems in libraries have been introduced a decade ago, but the staff from the three libraries interviewed have not yet adapted to these systems to manage electronic resources. The findings indicate that the Aleph system can integrate with an ERM system; however, there is lack of integration between ERM systems with the Library Finance System for purchasing electronic resources. The Librarians are dismantling systems and creating new modules out of frustration with the inflexible and non-extensible technology of their priority systems (Pace, 2004).

The lack of integration of an ERM system to the current ILS has had a negative impact on the productivity of the librarians on workflow management. Most ERMSs, whether commercial or open source, are not able to fully integrate the acquisition process into the acquisitions workflow of current ILSs, causing a messy and redundant workflow for the library staff (Wang & Dawes, 2012). The complexities of managing growing collections of electronic content make it difficult for libraries to implement and maintain electronic resource management systems to meet their business requirements (Abnu, Kataria & Ram, 2013; Feather, 2007; Grover & Fons, 2004; Kasprowski, 2006). This is supported by Collins and Grogg (2011), Ryder and Leue (2012) and Fu and Fitzgerald (2013) who agree that basic functionalities libraries had decades ago with ILS are still not available on ERM systems.

5.1.4 Knowledge and training

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

ICT training and development of the Library and Information Science profession (LIS) play a vital role in the development and training of library staff. Most library staff interviewed from the three libraries need training and awareness of ERM tools in libraries, including ERM systems. In addition, they also need to keep up with the latest trends in the ILS profession. There is a lack of training of library staff in managing library systems and a lack of awareness of new emerging technologies such as ERM systems. Breeding (2005:28) indicates that "we—vendors and librarians alike—allowed the ILS to be static, and by doing so we diminished possibilities of software that delivers more compressive automation for library workers and seamless access to information for library users". Library staff become frustrated with the ILS, noting its inadequacy in dealing with the daily tasks. Library users get confused with the many interfaces and complexities of library applications and systems, and libraries are nearing the tipping point for the dramatic change towards automation.

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

The current traditional ILS is outdated and redundant and no longer copes with the management of electronic resources. Kasprowski (2006) states that the steps required for managing electronic resources are more complex than those of print resources. This is supported by Fu and Fitzgerald (2013) who state that implementation of ERM systems and the integration with the new generation ILS will

raise concerns among librarians and library staff pertaining to their job security, who can be fearful of new technologies.

5.1.5 Infrastructure

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Utilisation and access of electronic resources in libraries play a significant role in supporting the core mission of the university, which is teaching, learning and research. Connectivity and poor internet access are two technical barriers making it difficult for library users to access electronic resources both internally and externally. The result of this study supports that of Ingutia-Oyieke and Dick (2010) as well as Peiris and Peiris (2012), that the lack of proper ICT infrastructure, low student electronic resource pattern usage, and pertinent issues affecting electronic resources (such as access and awareness), have not received attention in university libraries.

5.1.6 Collaboration

SQR 2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

There is lack of lecturer participation and collaboration with the library and the library training users to access library databases. The result of this study is supported by that of Ingutia-Oyieke and Dick (2010) as well as Peiris and Peiris (2012), that the lack of ICT skills, including lack of knowledge of the current and future trends of librarians in their workplaces, and the fact that there is no close collaboration between faculty and libraries, affect the role of academic libraries in teaching, learning and research.

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

The management of electronic resources in libraries involves a process of managing a wide range of licensed electronic resources and collaborating, cooperating and sharing resources with different libraries (Fu & Fitzgerald, 2013). The result of this study indicates that the consortium plays a vital role in collaboration and price negotiations in the acquisition of electronic resources. The three libraries interviewed collaborate through CALICO by sharing the ILS Aleph system and resource sharing through inter-library loans. The collaboration also contributes towards standardisation between the ERMs of the libraries. Ryder and Leue (2012) describe the role of ERMS

standards as uniformity, whether it is related to storage, retrieval, transmission or description of data, or assist in the integration of multiple systems e.g. ILS, OPAC and ERMS.

5.1.7 Legal requirements

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Libraries subscribe to electronic resources via vendor subscription. The licensing agreements and pricing model differ from vendor-to-vendor based on their size and usage. The vendors require that access to electronic resources be restricted only to authorised users of the library. Most license agreements clearly outline the need to control access only to those specified during the licensing process (Yu & Breivolt, 2008:252). The findings earlier show that the license regulation, copyright issues and intellectual property rights are factors affecting the access of electronic resources in libraries. The majority of library staff interviewed felt that SANLIC also plays an important role in negotiating pricing and licensing agreements for electronic resources.

5.1.8 ERM standards

SQR3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

Electronic resource managers, librarians and vendors developed sets of standards and guidelines. The most accepted guidelines are Digital Library Federation (DLF) and NISO's electronic resource management (ERM). The DLF ERMi initiative recommends the basic functions and structure of a database approach to managing electronic resources (Abnu, Kataria & Ram, 2013). This study shows that the majority of library staff do not have enough skills and knowledge of the current standards available for managing electronic resources.

5.2 Summary

The overall results show that library staff view ERM systems as an effective tool for the improvement of the management of electronic resources in libraries. However, the findings also show that library staff continue to use legacy systems in managing electronic resources, despite the introduction of ERM systems a decade ago. This is because of the lack of training in using ERM systems, fear of using current technology and keeping up with the latest trends in the ILS profession. There are also barriers in

managing, utilising and accessing electronic resources. Among these barriers are the high costs of acquiring ERM systems in libraries because of budget cuts, the high growth in the increase of electronic resources and different changing platforms, making it difficult for users to access electronic resources. Library users are unable to access electronic resources because of license restrictions, copyright issues and intellectual property rights. Another fact mentioned by the majority of the respondents is the lack of good ICT infrastructure and poor internet connectivity that restrict the access of electronic resources, resulting in a low usage of electronic resources.

Technology such as ERM systems in libraries is important for improvement in managing and accessing electronic resources. However, the majority of the respondents are of the view that the lack of integration of ERM systems with the Library Finance System for purchasing electronic resources is the main factor affecting the purchasing of ERM systems in libraries. From the findings it can also be concluded that library staff lack knowledge and training in ERM systems. Although there is some collaboration and resource sharing through library consortia, there is still lack of awareness of standards in electronic resources, including legal experience in maintaining the contracts and licensing agreements of electronic resources.

In chapter Six the conclusions and recommendations are discussed.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

The aim of the research (section 1.1.2) is to explore the challenges librarians are experiencing when implementing ERM systems. The **research problem** formulated in this research is that libraries find it difficult to implement and maintain electronic resource management systems to meet their business requirements.

In this chapter, the final conclusions and recommendations (section 6.2) are presented. The proposed guideline is presented in section 6.3 and future research is recommended in section 6.4. Finally, the limitations of research (section 6.5) including the summary and section 6.6 of the study are presented.

6.2 Conclusions

6.2.1 Primary research question

In order to explore the problem statement, the following research question was asked:

PRQ: How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

It is evident from the literature that technology adopted by ILSs was developed more than ten years ago and is outdated and no longer efficiently manages electronic resources. The data indicate that the three libraries interviewed do not use appropriate technologies to manage electronic resources. It is also noted that the three libraries still use legacy or traditional ILSs for the management of electronic resources despite the introduction of ERM systems in libraries. This is also despite the fact that library staff acknowledge that ERM systems are seen as an effective tool for maximising workflow and to manage complexities of electronic resources, including the facilitation of user access.

Sub-research questions 1, 2 and 3 are addressed by using the literature review in Chapter Two and themes developed in Chapter Four. As stated in Chapter One the research sub-questions are as follows:

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

The sub-research questions are addressed in the following objectives of the study, namely: i) to investigate what factors will be affecting the implementation of ERM systems in libraries; ii) identify barriers in the utilisation and access of electronic resources by users and library staff; iii) investigate standards for ERM systems in libraries; and iv) propose a guideline for libraries to use in order to enhance the development of ERM systems.

6.2.2 Sub-research question 1

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

The objective of this question is to investigate what factors will be affecting the implementation of ERM systems in libraries. The first objective of the study was to investigate the factors affecting the implementation of ERM systems in libraries. The findings of the study show that the three libraries interviewed use legacy systems in managing electronic resources despite the introduction of ERM systems a decade ago. The legacy systems include: Excel spread sheets, e-mail folders and other in-house databases. Factors identified as affecting the implementation of ERM systems are: i) the high costs in acquiring ERM systems in libraries; ii) the lack of staff training in using ERM systems; iii) the lack of the integration of ERM systems with the current ILS; and iv) Library Finance Systems that have an impact on library decisions to acquire ERM systems in libraries. The three libraries subscribe to electronic resources via various vendor subscriptions. The subscription to these electronic resources also contributes towards challenges that libraries are facing when considering the implementation of an ERM system. Challenges such as i) licensing regulations, ii) copyright issues and iii) intellectual property rights are affecting the management and access of electronic resources in libraries.

6.2.3 Sub-research question 2

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

The objective of this question is to identify barriers in the utilisation and access of electronic resources by users and library staff. The second objective is to identify barriers in the utilisation and access of electronic resources by library staff and users.

The barriers in the utilisation and access of electronic resources are: i) slow internet connectivity; ii) proper ICT infrastructure; iii) staff knowledge and training; iv) awareness and user training; v) faculty collaboration which affects the low usage of databases; and vi) access to electronic resources.

6.2.4 Sub-research question 3

SRQ3: How are current standards of electronic resource management used to improve the management of electronic resources to further the adoption of ERM systems?

The third objective of the study is to investigate the standards for ERM systems in libraries. This study show that the majority of library staff do not have enough skills and knowledge of the current standards available for managing electronic resources, and libraries need best practices for ERM system through collaboration, networking and resource sharing to successfully manage electronic resources.

6.3 Recommendations

The following guidelines are recommended:

6.3.1 ERM selection

1. **Proposed specifications for a new ERM system may include the following:**
    - i) Must be able to integrate with the financial modules of the library.
    - ii) Needs to facilitate business and service requirements across campus systems, as well as local and remote financial databases, vendor sites, purchasing and invoicing.
    - iii) The library fund accounting must be integrated with the campus financial system.
    - iv) Electronic signatures must be available.
    - v) All transactions must be electronically archived.
    - vi) Determine the availability of infrastructure according to IT specifications.
    - vii) General specifications:
        - a) System must be able to integrate with multiple databases.
        - b) Hardware and software as specified by IT need to be in place.
        - c) Reporting facilities tailored to the needs of users.
        - d) Security of system.
2. **Selection**
    - a) Specialisations need to be weighed against their importance for the business.

b) Select the three or four systems with the highest weight scores and ensure that they have an 80% or more alignment to the specifications.

3. Cost

a) Determine the cost of the three systems.

b) Rate the systems according to their cost/benefit/alignment ratios.

4. Vendors

a) Select appropriate vendor.

b) Be careful not to select cheapest.

c) Evaluate vendors according to institutional guidelines.

d) Ask IT to assist in selection process.

6.3.2 ERM implementation

It is important to develop an implementation plan. The IT department, library staff, as well as senior management down to the lowest level employee, need to be involved. Change management as well as communication strategies need to be in place.

6.3.3 Testing

Testing must be done with precision. It is recommended that the Systems Librarian be responsible for software testing. It is crucial for the library to have a checklist to test any system in the information system and technology environment (see Appendix C for the checklist for an ERM system). The purpose of this checklist is to identify potential risk of the business IT system and telecommunication infrastructure of a business system. The checklist should include the following:

- Data Centre Room Checklist
- Facility Power Checklist
- Logistics Checklist
- Network Specification Checklist
- The Data Recovery Checklist
- Disaster Recovery Situational Analysis

6.3.4 Risk management

It is important to identify risk reduction in implementation of the new ERM system. The risk reduction describes the key risk of delivering the library's electronic resource preservation strategy. These risks need to be monitored and updated on a quarterly basis by the IT Manager in collaboration with the Library Executive Management.

6.3.5 Management

For the successful implementation, adoption and acceptance of an ERM system it is imperative for top, senior, middle and lower management to be actively involved in

the institutionalisation of the new system. Without these role players it will be very difficult to successfully institutionalise an ERM system in any library.

6.4 Future research

The research case study strategy followed was that of a multiple case study, in which three libraries were used as case studies as discussed in earlier sections of the study. The sample of the case study was limited, with only 14 respondents interviewed. There is a need of a larger sample for future research in order to determine and investigate the future next generation library system to effectively manage electronic resources in libraries. For a future study, a comparative study to explore other tertiary institutions in South Africa needs to be conducted to reach a general conclusion. It is recommended that the library executive management in collaboration with library consortia, institutional ICT support teams, faculties and institutional HR staff training and development, support libraries with regard to providing training, creating an awareness campaign of electronic resource management campaigns and affordable ICT tools, in order for them to acquire new skills and use of newer technologies in the library and academic environment. It is further recommended that the proposed guidelines be expanded, as well as tested and extended to other tertiary institutions in South Africa as to its validity, and a thorough study be conducted to quantify financial losses in tertiary institutions in managing electronic resources, especially international subscription increases, of managing electronic resources.

6.5 Limitation of the study

The major limitation of the study is that it was conducted in three libraries at selected tertiary institutions in the Western Cape South Africa, which included Cape Peninsula University of Technology, University of the Western Cape and Stellenbosch University. University of Cape Town was excluded because of ethical issues, time and willingness of the library to participate in the study.

6.6 Summary

The finding shows that the three libraries are using traditional or legacy systems despite the introduction of ERM systems a decade ago. However, factors such as the high cost of technology and maintenance, ICT skills, lack of training and experience, poor internet connectivity and access of electronic resources, lack of awareness of ERM system standards, lack of marketing of electronic resources and lack of standards, including the inability of staff to keep up with the latest trends in technology, make it difficult for the libraries to implement ERM systems. Recommendations of the study were made and guidelines provided to assist libraries in formulating a collaborative platform for stakeholders, libraries, system vendors and subscription

agents for the implementation and development of ERMSs, identifying the gaps in existing literature of the management of electronic resources in libraries, and for the further development and adaption of ERM systems in libraries.

6.7 Reflection

The motivation for this study was influenced by my educational background in the field of library and academic environment and my passion to see that libraries have Return on Investment (ROI) in managing electronic resources. The purchase of electronic resources in libraries are costly and with the increasing demand of electronic resources, international subscription increases and the fluctuations in the exchange rates have had a negative impact on the subscription budget of the libraries electronic resources.

Despite the introduction of ERM systems over a decade ago, libraries in tertiary institutions are faced with the challenges of implementing ERM systems in their libraries, because of the high cost of acquiring these systems, lack of staff training, and knowledge of managing electronic resources. I decided to explore the potential use of the ERM system to enhance the management of electronic resources in libraries at selected tertiary institutions in the Western Cape, South Africa. The aim of this research was to explore and understand challenges librarians are experiencing when implementing ERM systems. The further aim was to propose guidelines for librarians to use for successful implementation of an ERM system. The research aims to contribute towards libraries and the academic environment, as well as proposing possible guidelines to overcome potential barriers that might prevent the use of these technologies by librarians at tertiary institutions.

Different approaches were used in this study to examine the problem. The research case study strategy followed was that of a multiple case study, where library staff working and managing electronic resources in three selected tertiary institutions in the Western Cape, South Africa, were randomly selected.

Data was collected using structured interviews with respondents who included the Library Director: Technical Services, Library IT Manager, Aleph Coordinator, Systems Librarians, Electronic Resources Librarians, Acquisitions Librarians, Faculty Librarians, Research Librarian and Institutional Repository Librarian. A pilot project was done by conducting interviews using semi-structured questionnaires with three senior library staff managing electronic resources. The interviews were scheduled a month in advance, but because of one institution’s problem with ethical clearance the interviews were delayed for three weeks. Three bias-related problems identified in this

research were respondents giving inaccurate information, concern about confidentiality of information, and interviewees having difficulty answering some questions and other library information, fearing violating the confidentiality and privacy of the library.

I used a number of documents and information including books, library webpages, databases and journal articles, pamphlets and promotional materials, and the internet as secondary data sources to compile a literature review.

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Appendix A: Questionnaires for interviews with libraries at selected tertiary institutions in Western Cape, South Africa

Primary Research Question:

How can libraries in the selected tertiary institutions adopt and implement ERM systems to effectively manage electronic resources to sustain and improve business processes?

INTERVIEW I1

LIBRARY IT MANAGER: LIBRARY A

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"We spend enormous amount[s] of money purchasing electronic resources, for example, our library spend[s] about 50% of the entire library budget on electronic resources, yet despite that we do not have [an] electronic resource management system. We spend huge amount[s] of money with other resources, yet [the] Aleph system was designed to manage print resources but does not [do so] effectively for electronic resources. I think purchasing an ERM system will not be a good idea because [the] Aleph system is under review and its contract expires 2017 and it will not make sense to get a new system now."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"*The management of electronic resources is done by using Excel spread sheets, which is not a very efficient way. We need to look at acquiring an ERM system for the library because we spend a huge amount of money on electronic resources, but we do not have a system to properly manage these resources.*"

Question 3

IQ1.3: Can the current Aleph system integrate with an ERM system?

Response to Question 3

"Aleph can integrate with an ERM. At the moment we are looking at the Next Generation Library System as well as different products. At this stage we are definitely looking at the kind of system that can integrate with other campus functions like [the] finance system, administration. It must be built from the latest architecture and be able to integrate with other systems."

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"There are different types of licensing agreement[s] for the management of electronic resources, there is also intellectual property rights and copyright issues for publishers, and lastly library users access electronic resources in different platforms or databases, therefore there [are] access problem[s] due to poor internet connection, especially during the training of library users to access the library databases."

SRQ3: What are the current standards of electronic resource management to further the adoption of ERM systems?

Question 5

IQ 3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"It is necessary to make sure that your ERMS [is] built on national [standards] and be able to integrate with other systems globally, for example one of the standards used is called SOAP (Standard Object Access Protocol) [which] facilitates the exchange of information between different applications."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"I think the role of consortia is important to improve standards, collaborating and resources-sharing of electronic resources, for example, the CALICO decision was for the four tertiary institutions in the Western Cape, South Africa to share one server and some of the files on the server will be shared, but each institution will have its own private environment where they could manage their own data, that is how CALICO was formed and up to now these institutions are still using the ALEPH system and there is still good collaboration."

INTERVIEW I2

DIRECTOR TECHNICAL SERVICES: LIBRARY B

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"The importance of [the] collection budget in academic libraries has grown significantly, and if you look at the split in the budget of most academic institution[s], a majority of [the] budget goes to electronic resources, I think in most cases the split is 80% to electronic resources and 20% for print, and that changes all the time, but linked to that is the cost of electronic resources and

[the] increase of these resources is a huge problem. I think ERM system[s] can effectively manage electronic resources but there are technical challenges as well."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We do not have [an] ERM system; we use the combination of [a] traditional platform like spread sheet[s] with [the] Aleph system and Discovery tool which is called Smart Search. It is basically our OPAC. We use A-Z list and SFX link resolver for the access of databases and we have acquisitions and cataloguing modules on the system."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I think Aleph can integrate with an ERM system, however an additional software such as the link resolver and discovery tools like primo have been acquired, therefore [an] ERM system like Verde from Ex Libris has been developed and they can integrate with particular ILS systems, but libraries have not yet adopted those systems because of technical issues."

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"I do not think the staff [are] reluctant in using newer technologies in electronic resource management, but the problem lies with keeping themselves abreast with the latest trends in managing electronic resources, which can be done by researching, benchmarking and sharing best practices with other institutions for future development of ERM systems."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"…I am aware of the standards and it is important to look at both national and international standards of electronic resource management, I know of [the] Digital Library Federation report which includes electronic resource management initiatives; it gives guidelines for library vendors and publishers, for example, the federated search system which make[s] it possible to search various database[s], the same standards have to be applicable for all ERM system[s] to be able to harvest metadata data to retrieve statistical usage, cost per downloads to avoid duplication and overlap of databases.".

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"I think local collaboration is important, for example, CALICO plays a vital role in the four institutions in the Western Cape, South Africa. There was an initiative of forming the acquisition forum among the four universities where best practices can be learned in the purchasing or acquisitions of electronic resources. SANLIC also plays an important role in the negotiations of licensing and pricing of electronic resources among libraries in South Africa."

INTERVIEW I3

ALEPH SYSTEM COORDINATOR

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"The challenge that libraries are facing is complying with licensing regulations, copyright issues in relation [to] the management [of the] ERM system and intellectual property including open access, and again duplication in the different collection[s] that you have, the vendors are always changes platforms."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"…I have not worked on an ERM system and have no operational knowledge of this particular system."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"The four Institutions in CALICO use Aleph ILS. Aleph cannot manage electronic resources because it is not an ERM system. ERM systems are design to manage functions like licensing agreements, contract management, authorisation, authentication and technical issues; Aleph can integrate [with] an ERM system but technical assistance is needed to work on the interface and that which can cost libraries a lot of money, therefore Aleph can integrate with ERM depending on the system architecture."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"Technological barriers [are] one of the challenges; poor internet connection makes it difficult for users to access electronic resources, for example, on campus and off campus access needs authentication through passwords, and support from ICT staff is needed all the time; another problem is the issue of ownership or intellectual property rights because vendors change

platforms all the time which make it difficult for the user to have access all the time they need information on the databases."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I do not know if there is a particular ERM standard but of course there are data coding standards, metadata coding standards; there are issues about their way of working in terms of managing licenses and other authentication… I do not know if there is a particular electronic standard, but of course there are data coding standards, metadata coding standards, there are issues about their way of working in terms of managing licenses and other authentication."

Question 6

IQ3.2 Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"Consortia [are] important for sharing material through shared collection development strategies and human resources management strategies; CALICO's role is to give the same library services and provision of information resources experience to registered students regardless of which tertiary institution they are enrolled at in the Western Cape."

INTERVIEW I4

SYSTEMS LIBRARIAN: LIBRARY A

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"I do not think it will be a good decision to purchase an ERM system now, considering that the library is currently reviewing the current Aleph system, and also, looking from the financial side at the financial cost to buy the system has cost implications. Libraries are also not in a good position because of the decline of the rand value, and libraries have to prioritise what we buy or not."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"A platform is needed to manage electronic resources; the current Aleph system does not have an ERM module platform to manage electronic resources; librarians rely on recording everything manually which is not a good idea for the management of electronic resources, but I know that Ex Libris have a platform of an ERM system called Verde, but I think it got financial implications so the library is currently not looking at acquiring new systems."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"Aleph can integrate with an ERM; as I mentioned earlier a platform such as Verde can improve the management of electronic resources, however, considering that [the] contract of the current Aleph system is expiring at the end of 2017 [it] is not recommended that the library acquire an ERM system."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"I think that the library has decided to currently focus on managing electronic resources on traditional system[s] such as Microsoft Excel and other traditional platforms; from a systems librarian perspective I think the challenge will be to purchasing an ERM system that can integrate with the current Aleph system."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I am not aware of standards on electronic resource management."

Question 6

IQ3.2 Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"In my opinion CALICO need[s] to look at benchmarking with other consortia in other provinces outside the Western Cape, like SEALS in the Western Cape and GAELIC in Gauteng Province which use different traditional integrated systems with a built ERM system like SIERRA."

INTERVIEW I5

SYSTEMS LIBRARIAN: LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"I am not familiar with the pricing of ERM systems, but I think the integration with the current ILS system and costing is the factor affecting libraries in purchasing; another factor can be that staff are not familiar [with] these systems and the rapid change in technology, for example ERM system[s] means that the libraries are now looking at the Next Generation Library system with an ERM component to manage electronic resources."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"I know that Microsoft Excel document is used for storage and management of electronic resources; we also use SFX by Ex Libris link-resolver to convert the A-Z List databases into Full Text for easy access of electronic resources. As a Systems Librarian my role is also to do batch load electronic resources records into [the] Aleph system to make it discoverable through A-Z lists for access to electronic resources databases."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"*I think it is possible for Aleph to integrate with an ERM system but the library is currently investigating the Next Generation Library system in collaboration with CALICO Consortium like QUALI, an open source system, OCLC World Share and Alma from Ex Libris."*

Question 4

IQ2.1: What are the main issues and challenges libraries are facing the utilisation and management electronic resources?

Response to Question 4

"If we look at ERMS in libraries it is clear that library staff do not have experience with ERM systems. I think the systems are difficult to operate, there is also lack of integration with the current ILS; licensing agreements and information security is a concern because the system is cloud-based. Previously the Aleph system was developed to manage print resources and need[s] to be upgraded to manage electronic resources."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I know there are standards in place to improve the interoperability of the system to improve sharing and collaboration in libraries; the DLF (Digital Library Federation) and NISO have ERM initiatives that are standard for a workflow in an ERMS, and they have a dictionary in an XML schema."

Question 6

IQ3.1: Can you please describe the role of consortia in the libraries?

Response to Question 6

"I think if we have purchased an ERM system in South Africa we can benefit not only from sharing and collaborating in having an ERM system in libraries, but also we can share the same standards. Collaboration is currently done through [the] CALICO Consortium with Aleph Resource sharing; SANLIC negotiates licenses and lower [prices] for purchasing electronic resources."

INTERVIEW I6

ELECTRONIC RESOURCES LIBRARIAN: LIBRARY A

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"There is [a] lot of cost involved in purchasing ERM systems and require ICT skills to implement; we do not have experienced staff who specialise in these systems."

Question 2

IQ1.2: What current systems are you using to manage electronic resources?

Response to Question 2

"We do not have an ERM system in place to manage electronic resources, but it can be an efficient way to store electronic information. We use Excel spread sheet[s] to store information like username, password, vendors contact details, licensing agreements; of course with our traditional ILS Aleph system, [we] sometimes store in e-mail folders and with the migration from GroupWise to Microsoft outlook the information was lost during the process."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I do not think it is possible for the current ILS which is Aleph to integrate with an ERM system because there is no proper ICT infrastructure to support the new ERM system."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"The challenge is the high increase [in the] cost [of] ERM systems and the library has [a] limited budget to purchase new systems, taking into consideration the current financial situation of libraries."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question no 5

"I think communication is important between Librarians and Vendors to improve standards and work around on certain things that the system vendors can make available for future needs and requirements of the system."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"I think consortia like SANLIC plays [sic] an important role; it represents all the academic and research libraries in South Africa to negotiate pricing and licensing of electronic resources on their behalf to negotiate better deals."

INTERVIEW I7

INTERVIEW WITH ELECTRONIC RESOURCES LIBRARIAN: LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"Cataloguing of electronic resources is a new trend in the field of librarianship, therefore cataloguing librarians are not train[ed] in the new field and need new skills in cataloguing electronic resources."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We are using Ex Libris product Aleph which is our ILS system; the library at present does not have any home-grown, commercial or open source system to manage electronic resources; we use rudimentary forms [such] as Excel spread sheet, emails, personal folders on computers and network shared folders and those are primitive system[s]."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

It is definitely possible to integrate the current ILS with an ERM system; however, the system cannot integrate with the Library Finance System which is needed for the acquisition of electronic resources; there is also [a] technical reason for the system not to integrate with the institution['s] ITS system for online purchasing of electronic resources."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"The processes of electronic resource management include several functions in the library, like cataloguing, acquisitions and the discovery tool; the challenge is that only one Electronic Resources Librarian is responsible for the entire process of electronic resource management; the second challenge is the access of electronic resources, as off campus access is tricky to manage for a variety of reasons, and legal aspects around copyright issues including license negotiations of electronic."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"There is ERMi (electronic resource management initiatives) of the Digital Library Federation which is DLF, and the DFL report 2004 has provided commercial vendors with a blueprint for development by noting functional specification and best practices for ERM systems."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"Collaboration is necessary; in addition, there are other important consortium [sic] in South Africa besides CALICO that is [sic] strong in electronic resource management."

INTERVIEW I8

INTERVIEW WITH ELECTRONIC RESOURCES LIBRARIAN: LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"The main challenge is the licensing agreements, cancellation and renewal of electronic resources and understanding the legal contracts of electronic resources subscription."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We use Excel spread sheet to manage electronic resources with the combination of the ALEPH system."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I do not think Aleph can integrate with an ERM system because it was originally developed to manage print material rather than electronic resources."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation of and management electronic resources?

Response to Question 4

"The challenge is the drastic cut of budget [in the] current financial situation, and secondly, the current usage of electronic resources is very low which make[s] it difficult to motivate whether

to renew or cancel a database due to increase [in the cost] of electronic resources subscriptions."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"Well, I have been in this position as Electronic Resources Librarian for over a year now so the whole business of electronic resource management is new to me; I do not have knowledge of any standards."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"I think definitely [it] is good to have a platform where everything can be discussed."

INTERVIEW I9

FACULTY LIBRARIAN: LIBRARY A

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"Issues that we are currently [facing] are the internet connectivity which affect[s] the access of electronic resources on campus and off campus; we do receive calls from students of problems with access, for example Novell Login details to login and password[s] especially with newly registered students."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We use Aleph system discovery tool and e-mail folders and Excel to store information of electronic resources."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I do not work with an ERM system; as a Faculty Librarian I only use the discovery tool platform. The Systems Resources Librarian will be able to give more details on this question."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"The challenge we [are] facing is low usage and marketing electronic resources, and lecturers [who] do not encourage students to use electronic resources; another challenge is that the time allocated by lecturers for faculty librarians to conduct training for students on accessing databases and other electronic resources material is limited; some lecturers refuse to participate and allow students to train."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I have no knowledge of standards; the Electronic Resources Librarian work[s] with the standards."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"Consortia is [sic] good for collaboration, networking and sharing best practices with other libraries."

INTERVIEW I10

FACULTY LIBRARIAN: COMPANY LIBRARY B

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

`*"Internet connectivity and access to electronic resources is a challenge, especially after hours as the library is open until 12 pm midnight and there are no staff available to assist with access problems."*

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We use Aleph system discovery tools and in-house databases like traditional Excel spread sheet and e-mails."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I have no technical experience with the Aleph system; the IT manager looks at [the] technical side of the system, reviews and upgrades of the system."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"The high cost and increase of electronic resources and the introduction of the VAT Act on the electronic resources subscription effective from 2014, are the main issues affecting the utilisation and access of electronic resources in libraries."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I am not aware of any available standards; the Electronic Resources Librarian's job portfolio is to research and look at available standards for managing electronic resources; currently CALICO shares the Aleph system and inter-library loans and [I] think this platform can share best practices and standards in the management of electronic resources."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"The role of consortia is to improve collaboration and sharing best practices and standards in the management of electronic resource; currently CALICO shares the Aleph system and interlibrary loans."

INTERVIEW I11

FACULTY LIBRARIAN - LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response Question 1

"I think the cut of [the] collection budget and exchange rate, and the introduction of the new VAT Act on electronic resources has an impact on the purchasing of electronic resources."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We do not work with an ERM system, we use Excel spread sheet."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I don't have an[y] idea; the Systems Librarians work with the technical issues of the system."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"The introduction of the VAT Act that libraries must also pay VAT on electronic resources subscription[s] effective from 2014 by the National Treasury, are factors affecting the utilisation and access of electronic resources in libraries; this results in libraries cancelling or not renewing subscription of electronic resources that are underutilised."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I am not aware of any available standards."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"The role of consortia is to improve collaboration and resource sharing of among libraries."

INTERVIEW I12

ACQUISITIONS LIBRARIAN: LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response to Question 1

"I think the purchase [of] ERM systems in libraries is done by the IT team without input from the rest of library staff, and after purchasing the system they discover that it is not aligned with institutional and Library strategy. I will not recommend the idea of ERM while they are still investigating the Next Generation Library; the current Aleph expires during 2017."

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We use the combination of the Aleph system and Excel spread sheet."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"Aleph system can integrate with an ERM system but not fully because of the lack of integration of the Library Finance System; if your ILS is compatible you can experience problems."

SRQ2: What issues and challenges are library users facing in the utilisation of electronic resources in libraries?

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"Staff need to have ICT skills and a lot of IT support is needed to make the electronic resources accessible to the users. Good ICT infrastructure is needed because it is difficult to manage electronic resources if you do not have a stable network. Unstable networks make [it] difficult for the access and utilisation of electronic resources."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I am not aware of standards but I think attending conferences is good for networking where best practices and standards in managing electronic resources can be shared among libraries."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"It is good in building collaboration and relationship among libraries; currently with CALICO the four institutions in the Western Cape South Africa have a shared system, Aleph system, including inter-library loans as resource sharing tool."

INTERVIEW I13

RESEARCH LIBRARIAN: LIBRARY C

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries in the implementation of ERM systems?

Response Question 1

"I don't think it will be necessary to purchase an ERM system. We are currently looking at the Next Generation Library System with an ERM component to improve the management of electronic resources. The ALEPH system previously designed to manage more printed resources effectively, and it is not coping with the management of electronic resources".

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We do not work with an ERM system, we use Excel spread sheet."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I don't have an idea; the Systems Librarians work with the technical issues of the system."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"High cost[s] and [the] rapid development increase in managing electronic resources makes it difficult for staff to keep up with the latest trends in the access of electronic resources. For example, platform changes and the issue of copyright is a challenge. We were using the platform called RefWorks for referencing and now it is replaced by Mendeley; off campus access is always problematic because of unstable network."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I am not aware of any standards in place in managing electronic resources."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"The four institutions can collaborate more as CALICO libraries, not only about Aleph system and inter-library loans but also sharing best practices and standards in terms of managing e-resources."

INTERVIEW I14

INSTITUTIONAL LIBRARIAN: LIBRARY A

SRQ1: What are the main factors affecting the implementation of ERM systems in libraries?

Question 1

IQ1.1: What are the challenges faced by libraries with the implementation of ERM systems?

Response to Question 1

"I think there is cost involved because of the increase of electronic subscription and the software is managed by a vendor or subscriber somewhere on cloud-based".

Question 2

IQ1.2: What current system are you using to manage electronic resources?

Response to Question 2

"We use both a manual system and Aleph system to manage and store electronic resources like vendor details, licensing, renewals, cancellation, usage statistic and administration."

Question 3

IQ1.3: Can the current Aleph System integrate with an ERM system?

Response to Question 3

"I do not think [the] Aleph system can integrate with an ERM system; it will be good to have such system but in my case as an Institutional Repository Librarian it will make it easy to manage the Institutional repository which is open access and cloud based, so obviously the new system need[s] to meet those requirements."

Question 4

IQ2.1: What are the main issues and challenges libraries are facing in the utilisation and management of electronic resources?

Response to Question 4

"Our Institution use[s] a platform called Digital Knowledge to manage the repository; it has its own problems and implications, for example, legal issues such as Copyright, Intellectual Property rights for publishers on Open Access control."

Question 5

IQ3.1: Are you aware of available standards of electronic resource management in libraries?

Response to Question 5

"I don't have an idea of available standards in electronic resource management."

Question 6

IQ3.2: Can you please describe the role of a consortium in ERM in libraries?

Response to Question 6

"It is good in building collaboration and relationship[s] among libraries. Calico, we are in partnership with CPUT, UWC and CPUT in terms of Aleph system and resource sharing."

Appendix B: List of system requirements document

LIST OF USER REQUIREMENTS	
1	**Open Public Access Catalogue**
1.1	The system should be built around a single workstation concept where staff can use all appropriate services and systems, bot externally and locally from a single work station.
1.2	The system should be able to handle full sophisticated search capabilities, including full search capabilities, including Boolean searching, full text – document searching, etc.
	• Support Boolean Searching (e.g. SABINET online), phrase searching, truncations, wild cards etc.
	• To be able to search full-text documents
	• To be able to search by subject, or by their authority files e.g. author subject etc.
	• Limit by field, e.g. ISBN, Author, Title and Publisher
	• Support different formats e.g. pdf, images, etc.
	• Allow users to search the local catalogue, other institutions' catalogues as well as web search engines simultaneously
1.3	The OPAC should be fully integrated with all other modules.
1.4	The OPAC should enable reservation facilities including:
	• Ability to reserve a book or a journal with "out on loan" status
	• Ability to reserve a book or a journal, that is on shelf from the self
	• Ability to reserve a book or a journal for an interlibrary loan
1.5	Display option:
	• The OPAC should allow for a variety of display options e.g. citations only, summaries and full records
	• To be able to link to a full text or online document
	• Loan status and the due date should be displayed
	• Results should be sorted by relevance or chronological order
	• Ability to print, email export results
1.6	Borrowers or Users/Customers:
	• Renew their own journals or books online
	• Change their personal details
1.7	CRM functionalities through push or pull technologies:
	• Profiling
	• Enable user to maintain own profile
	• Change personal details
	• View loan status
	• Personalisation
	• Current awareness
	• Customable display options; amount of result display and in what order

LIST OF USER REQUIREMENTS	
1.8	Subject portals which include:
	• Discussion forum
	• Pushing of current awareness
	• Users to submit comments and content to the portal
	• Classification system
1.9	Feedback Form:
	• The OPAC must be fully customable and easy to manage (easy to use and accessible via Web browser from the office, off campus and wireless
	• User friendly integrating with the users' desktop
	• Enable the server and the network to be able to automatically update the client software of the user's workstation
2	**Circulation Module**
	• This module should be simple and intuitive to use
	• Enable staff to access all functions with a single click or equivalent keyboard command
	• Streamline workflow and increase work efficiency
	• Support circulation functions
3	**Acquisitions**
	• Streamline workflows and increase efficiency
	• Easy to navigate and use
	• Seamless integration
4	**Financial Accounting and Budget Management**
	• Currency converter
	• Easy to navigate and use
	• Seamless integration
4.1	Full Integration with other modules.
4.2	Authority list of preferred vendors and suppliers.
4.3	Function that allows alert for Acquisitions Librarian for a book in order that has not arrive on specified time.
4.4	Comprehensive functionality and detailed reporting.
4.5	Web content integration.
5	**Serial Control**
5.1	Integrate with other systems, e.g. circulation, cataloguing acquisitions and Web OPAC.
5.2	Allow multiple copies with multiple ownerships.
5.3	OPAC display should include the following:
	• Tile and publisher
	• Latest issue received
	• Date of first acquisition
	• Is it in print or electronic with a link?

LIST OF USER REQUIREMENTS	
6	**Cataloguing**
6.1	Should be able to integrate with other modules.
6.2	Be simple and intuitive to use.
6.3	Provide free as well as controlled indexing.
6.4	Import subjects e.g. subject lists.
6.5	Display screen should include MARC text screen and full record screen.
6.6	Allow abstracts, descriptions and web linking.
6.7	Support weeding and stock taking activities.
7	**Security**
7.1	Manual of security profile should be done offline by staff.
7.2	Only authorised staff can be able to override the system.

List of System Requirements	
1 General System Requirements	
1.1	**Client Hardware**
	The system must support client platform independence for all staff and OPAC functions.
	All staff and OPAC module must be capable of running windows 2000 XP/CPU Pentium III (Linux, Max OS X) workstations.
	All staff commands must be capable of being performed by keyboard and mouse.
1.2	**Logins**
	All client software should allow for customisation of screen displays.
	User preference and privileges will be based upon user identity.
1.3	All updates and indexing transactions must be performed in real-time, without the need for a batch or items.
1.4	The system should employ an integrated database shared by all modules.
1.5	The proposed system should include unlimited public access catalogues, both on and off campus.
1.6	The system should be stable and self-maintaining.
1.7	The application should allow staff to generate statistical reports without need for advanced query language.
1.8	The system must be able to provide an SQL option if required by the library.
2	**Services and Support**
2.1	Ongoing maintenance plan and support 24 hours including service plan upgrades.
2.2	Vendor support 24 hours per day, 365 days per year, via toll free number.
2.3	The vendor must provide a web-based customer support facility.
3	**Reports and Statistics**
3.1	The system must provide standard statistical report generated automatically.
3.2	The system must not require additional software to view statistical report.

3.3	The system must not require staff user license to view statistics.
3.4	The system must be able to provide custom report writer.
4	**Responsiveness: R&D**
4.1	Describe upgrade procedure for the system.
4.2	Describe the library approach in using the next generation products in the past and plans for the future product lines and impact of product end-life of the library.

Appendix C: System Checklist

Data Center Room Checklist

Complete the following checklist to ensure that the data center room requirements are met. For information about the data center requirements line, see "Flooring Requirements".

Access Route Considerations	Y	N
Has the access route been checked for clearance of the packaged equipment?		
Do all the doors and entry ways conform to the width and height requirements for transportation, including the width of the unpacked unit?		
Do all the doors meet the height requirement of minimum 86 inches for packaged delivery?		
Does the access route provide sufficient space for transport of the packed devices?		
Are there any ramps or thresholds of concern? If yes, then provide details.		
Are there any stairs or ramps in the moving patch for the new hardware?		
Have you confirmed that all route incline angles are within the permitted range?		
Have you confirmed that the access route is free of any obstacles that would expose the device to shock?		
Are all the surfaces acceptable for rolling out the new unpacked and packed equipment?		
If a pallet jack is to be use, have you confirmed the following: The pallet jack supports the device weight? The pallet jack tires are compatible with the shipping pallet?		
If there are stairs, is a loading elevator accessible for the equipment?		
If an elevator is to be used, have you confirmed the following: The elevator car is wide enough for the device to be carried into it? The elevator car is high enough for the device to be carried into it? The load limit of the elevator is greater than the device weight? Are elevators available to handle up to 1049.09 kg (2308 lbs.) fully-loaded rack capacity? The elevator door meets the minimum height requirement of 86 inches for packaged rack delivery?		
Does the path from the receiving location to the designated data center area support the weight of the unpacked equipment?		
Is the path onto the raised floor rated for dynamic loading of the server? Refer to "Flooring Requirements" for requirements.		

Facility Power Checklist

Complete the following checklist to ensure that the facility power requirements are met. For information about facility power requirements, see "Electrical Power Requirements".

Facility Power Considerations				Comments
Will you be using single-phase (low-voltage or high-voltage) or 3-phase (low-voltage or high-voltage) power?				
Are enough power outlets provided within 2 meters for each rack?				
Do the power outlets have appropriate socket receptacles for the PDU option ordered? Options are low voltage or high voltage, single-phase or 3-phase.				
Will optional ground cables be attached to the rack?				
Are the circuit breakers for the equipment suitable in terms of voltage and current-carrying capacities?				
Does the power frequency meet the equipment specifications?				
Are power outlets available for the new equipment at the designated location?				
Will system power be delivered from two separate grids?				
Is there a UPS to power the equipment?				
Do you have the minimum required power sources to support the power load for the new hardware? Use kilowatt (kW)/kilovolt (kVA) to express power load.				

B.6 Power Checklist

Complete the following checklist to ensure that the power requirements are met for Database Machine for information about Electric Power Requirements.

Power Checklist Considerations				Comments
Do you have the minimum required power sources?				
Are power outlets available for the new equipment at the designated location?				
Does the power frequency meet the equipment specifications?				
Is there a UPS to power the equipment?				
Is there security or access control for the data center?				
Are there any security background checks or security clearances required for vendor personnel to access the data center? If yes, then do you have a recommended agency?				
How many days in advance must background checks be completed?				

B.8 Logistics Checklist

Complete the following checklist to ensure that the logistics requirements are met. For information about unpacking and space requirements, see "Space Requirements".

Logistics Checklist Considerations				Comments
Do you have contact information for the data center personnel?				
Is there security or access control for the data center?				
Are there any security background checks or security clearances required for vendor personnel to access the data center? If yes, then do you have a recommended agency?				
How many days in advance must background checks be completed?				
Are there any additional security access issues?				
Is computer room access available for installation personnel?				
Are laptops, cell phones, and cameras allowed in the data center?				
Does the building have a delivery dock?				
Is there a delivery/unpacking/staging area?				
Is the delivery inside?				
If the delivery is not inside, then is the site prepared for uncrating?				
Is the unpacking/staging area protected from the elements?				
Does the building have adequate receiving space?				
Is the unpacking area air-conditioned to avoid thermal shock for various hardware components?				
Will sufficient moving personnel be available to install the hardware?				
Is union labour required for any part of the delivery or installation?				
Are you prepared for uncrating and trash removal?				
Is uncrating of cabinet and cabinet trash removal required?				
Does the customer allow cardboard boxes and other packing material in the computer room? If no, then do ground level deliveries require a truck with a side rail lift?				
Is there a time constraint on dock access? If yes, then provide time constraints.				
Is tail lift required on delivery carrier to unload the equipment at the delivery dock?				
Will any of the following be required to place equipment in computer room? Stair walkers Lifters Ramps Steel plates Floor covers				
Does the delivery carrier require any special equipment, such as non-floor damaging rollers, transport dollies, pallet jacks or fork lifts?				

Network Specification Checklist

Complete the following checklist to ensure that the network specification requirements are met.

Network Specification Checklist	Y	N	N/A	Comments
Did you complete all the networking work sheets?				
Have you received the site-specific installation template?				
Did you verify that the IP addresses in the installation template are currently not in use?				
Have you performed the required configuration within your network infrastructure to allow the hardware and software platform machine to be used?				

Network Assessment Analysis Checklist

- Identify scope of service
- Identify devices: Hubs, Routers Gateways, Modems, T1, ISDN, Infolink, etc.
- Automatic surveillance – reactive and pro-active monitoring
- Fault diagnostics
- Configuration management
- Performance monitoring and analysis
- Security alerts, reporting and administration
- Capacity planning
- Ongoing Projects – upgrades, rollouts, expansion
- Identify equipment, suppliers, and contracts
- Number of stores
- Home office
- Remote offices, client staffing and organisation
- Define all supports groups, roles and responsibilities, number of staff – both internal and external
- If external staff – define availability and contract obligations
- Coverage hours
- Notification process
- Escalation process
- Call in/out procedures
- Network operations center – staffing, capabilities, functions
- Identify responsibility and procedures for: change management, contract maintenance, and license
- Agreements, hardware ordering, fix/replace
- Training/ re-training procedures

Network

- Review corporate network
- Define primary use
- Describe the enterprise: user locations, site definitions, connectivity between sites, number of total users, and number of concurrent users
- Obtain network and connectivity diagrams
- Define the predominant transport protocol
- Network operating systems
- Define how remote sites are connected
- Define how the enterprise is connected to the public internet
- Define internet security
- Define the e-mail system
- Define bandwidth
- Who is your provider?
- Define the IP address setup and range
- Define all network hardware in use or planned for
- Define the network monitoring procedures
- What network tools are used?
- Define network redundancy
- Firewall/access list management
- Hardware
- Define all hardware used in all stores and offices
- Analyse and diagram store cabling
- Define onsite repair procedures
- Define procurement, installation and upgrade procedures and resources
- Moves and changes
- Maintenance scheduled and procedures
- Fix/replace procedures
- Spares
- Define all third party agreements and service levels
- Service levels
- Hours of coverage
- Network “uptime” requirements
- Internal and external SLAs
- How are issues resolved?
- Does SLA provide for backup facilities or redundancy?
- Define number of users – total number and concurrent
- Define user’s activities
- Define hours of use
- Define type of access – internet, remote, dial in, VPN, etc.
- Data types

- Files sizes
- Transmission requirements
- Query versus inquiry
- Historical amount

Reports

- Number of reports
- Number of users
- How are they distributed?
- Ad-hoc or canned reports – number, frequency
- Historical reporting – how much, frequency, number of users, distribution

Credit Networks

- Confirm all networks used and for what functions
- Verify terminal ID (TID) from your credit network. (NBS, ADS, Citgo, Conoco/Phillips, Lynk, Exxon/Mobil, etc.)

The following checklist is specific to the power distribution units (PDUs) when using the reracking service.

PDU Reracking Considerations	Y	N	N/A	Comments
Does the target rack support installation of standard Oracle PDUs? If not, complete this checklist?				
Can the customer provide an equivalent pair of PDUs?				
Can the customer provide two PDUs with capacity of 10kVA per PDU?				
Can the customer provide at least the following number of 10A C13 plugs per PDU: • Half rack: 46 cables • Quarter rack: 28 cables • Eighth rack: 20 cables				
Can the customer provide a single PDU and its circuits to support the Oracle Exadata Rack power requirements in case one PDU fails?				
Can the customer ensure power loads are evenly distributed across all circuits of a single PDU?				
Can the customer provide appropriate power drops for the PDUs?				

The Data Recover Checklist

Recycling Considerations	Y	N	N/A	Comments
Is the existing solution “virtual ready”?				
Is the hardware and vendor agnostic?				
Is it fully application aware?				
Does it involve limited complexity for DR processes?				
Is it simple to use with little to no learning curve?				
Is the solution scalable?				
What’s the performance impact?				
Is it prepared for mobility and migration?				
Is it cloud ready?				

Disaster Recovery Situational Analysis

Recycling Considerations	Y	N	N/A	Comments
Is it a local data protection /backup?				
Is it a snapshot-based replication?				
Is it an array-based replication?				
Is it host/guest-based?				

Appendix D: Interview consent form Cape Peninsula University of Technology

Cape Peninsula University of Technology

Office of the Director: CPUT Libraries
Dr E.R.T Chiware
E-mail: chiwareE@cput.ac.za
Tel: 021 959-6320/6322
Fax: 086 778 0432

I Dr. Michiel Moll, in my capacity as Deputy Director at Cape Peninsula University of Technology Libraries give consent in principle to allow Regina Sikhosana, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his/her M Tech (IT) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

These consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓			
No				

Dr. Michiel Moll

27.11.2015

27 November 2015

Appendix E: Interview consent form from the University of Stellenbosch

Biblioteek- en Inligtingsdiens

Library and Information Service

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY

8 December 2014

I Ellen Tise, in my capacity as Senior Director, Library and Information Service at Stellenbosch University give consent in principle to allow Regina Sikhosana, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his/her M Tech (IT) research.

The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below.

(Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	X			
No				

Ellen Tise
Senior Director, Library and Information Service

Biblioteek- en Inligtingsdiens Library and Information Service
Privaatsak/Private Bag X5036 • Stellenbosch 7599 • Suid-Afrika/South Africa
Tel: +27 21 808 4876 • Faks/Fax: +27 21 808 3723 • www.sun.ac.za/library

Appendix F: Interview consent form University of the Western Cape

Private Bag X17, Bellville, 7535
South Africa
Tel: +27 (0) 21 959 2947
Fax: +27 (0) 21 959-3659
Email: [illegible]
Website: www.uwc.ac.za

Permission for collection of research data

I, Allison Fullard, in my capacity as Acting Library Director at the University of the Western Cape, give consent in principle to allow Regina Sikhosana, a student at the Cape Peninsula University of Technology, to collect data in the library as part of her M Tech (IT) research. The student has explained to me the nature of her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below.

	Thesis	Conference paper	Journal article	Research poster
Yes	✓			
No	x	x	x	x

19 JANUARY 2015

UNIVERSITY of the WESTERN CAPE

A place of quality, a place to grow, from hope to action through knowledge

Appendix G: Cape Peninsula University of Technology ethical clearance certificate

Cape Peninsula University of Technology

P.O. Box 1906 • Bellville 7535 South Africa •Tel: +27 21 6801680 • Email: saliefa@cput.ac.za
Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	Faculty: BUSINESS

At a meeting of the Research Ethics Committee on 03 September 2014, Ethics Approval was granted to SIKHOSANA, Regina Balengane (213280571) for research activities Related to the MTech/DTech: MTech: BUSINESS INFORMATION SYSTEMS at the Cape Peninsula University of Technology

Title of dissertation/thesis:	Managing electronic resources at a selected tertiary institution Supervisor: Dr AC De La Harpe

Comments:

Decision: APPROVED

Signed: Chairperson: Research Ethics Committee	03 September 2014 Date
Signed: Chairperson: Faculty Research Committee	Date 24/10/14

Clearance Certificate No | 2014FBREC234