

CHRISTIAN SERVICE UNIVERSITY COLLEGE

KUMASI

DEPARTMENT OF COMPUTER SCIENCE



LIBRARY MANAGEMENT SYSTEM

***IMPLEMENTING AN INTEGRATED LIBRARY SYSTEM (ILS) FOR CHAPMAN
LIBRARY (CSUC) USING KOHA***

A DISSERTATION SUBMITTED TO THE **DEPARTMENT OF COMPUTER SCIENCE**, CHRISTIAN SERVICE UNIVERSITY COLLEGE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE **AWARD OF BSC. (HONS) DEGREE IN COMPUTER SCIENCE.**

SALLY APPIAH

EDWARD AKWASI ANTWI

JUNE, 2013.

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BY

SALLY APPIAH

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DECLARATION

We hereby declare that this dissertation is completely our own work. Materials which we used in our project are mentioned by reference.

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ABSTRACT

In advanced countries, where the use of Computerized Library System is an evolving technology, which involves developments in the area of resource sharing and globalization of Information Access. In such a scenario, the role of the librarian is no longer to make available the most suitable books or editorial or facts accessible within the library but to seek out the information necessary by the user from any library. The recent advancement in information technologies and system has become the key concerns of librarian and libraries. Libraries need to develop their resources access, analyse the need of their users and seek to develop resources to meet this needs. As a learning and knowledge organization, schools should empower their libraries to develop the appropriate tools in coping with the growing library trends and standards. The Christian Service University College's Library System is a Manual System, which covers manual transactions inside the library, such as borrowing, returning, and recording of the books and the registration of the new borrowers. The proposed system will help the librarian to closely monitor the condition of the library. This system is also designed to speed up every transaction inside the library. The main objective of the proposed system is to increase the efficiency and security of record keeping of the school. The system will also generate reports that are needed in monitoring the library. The proposed system is designed with security to protect sensitive files from unauthorized access. Only authorized users can have an access to confidential files. The security of files is achieved through the use of Username and Password for identification and authentication of the user. The proposed Computerized Library System of Christian Service University College will improve and speed up library transactions.

We seek to implement a powerful and flexible integrated library system, supporting the academic, research and administrative needs of all academic members including students & faculty. Here, we have adopted KOHA, which is an open source software. And, after some research on KOHA, we identified KOHA as having the capability to improve the quality, speed & effectiveness of this service. In one word, we want to implement a system which will provide a barrier-free, timely access to the information resource of the Christian Service University College library as well as gateways to national and international resources.

DEDICATION

This project is dedicated to the Almighty God, to Mr. Mark Kwesi Benyih (Sally's Husband) and to our supportive parents and guardians.

ACKNOWLEDGEMENTS

We would like to thank our dissertation supervisor Mr. Emmanuel Adinkrah for supervising our project. Special thanks go to the Head and staff of Bill Chapman Library (Christian service University College), for their constant help.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

A library is a collection of information sources, resources, and services: it is organized for use and maintained by a public body, an institution, or a private individual. (Allen, R. E., ed. (1984). In the more traditional sense, a library is a collection of books. Library is an important part of the academic sector as well as some professional sectors. Proper cataloguing basically defines the efficiency of a library and how easily one can get the books of their choice.

Currently our society has experienced a tremendous advancement in technology, a prerequisite in bringing about progress as we move along in this computerized world. These changes are to improve efficiency, ease manual processes and provide convenience to users. The relationship between the library and computer is constantly changing in that the use of the computer contributes to the way one learns and gains access to plethora of information/knowledge.

The phenomenon of change is inevitable and since libraries are no different from any organisation or institution, considering the use of information technology to perform a given task will be efficient. Due to limited time, if there are numerous tasks or processes taking place at the same time within a particular place, there is the need for integration of all these processes.

Librarians have the responsibility not only to know about the ways in which libraries will be managed using techniques of automation, but also to be aware of the changes that automation can bring to the library services in the near future. This is because the flow of work in an automated system can differ quite considerably from that of the manual system. In recent history, information technology advancement has changed the lives of humanity and has made it easier. In this regard, many tools, technologies and systems have been produced.

This project is aimed at offering solutions to the challenges regarding library procedures and management, and to provide a user-friendly system for ease, comfort and efficiency. This project is concerned with configuring and deploying an open source library management system software-KOHA for the Chapman library (CSUC). This system with its reliable components is intended to make the library management more efficient and easier to handle. According to UNESCO an ILS is "an automated library system that is capable of managing the operations of more than one basic library function". Integrated library management system is a system which can keep track of library operation such as cataloging, billing, tracking various items owned by the library like books, journals, magazines, dvds, orders or reservations made by various faculty staff & students and also patrons of management. By this system any library can operate all the library operation easily and centrally. ILS can connect various libraries together including their various branches.

Integrated Library Systems are also known as "library management system" or "automated library system" (Adamson, Veronica, *et al.* (2008)). Before any automated library system, libraries usually used a card catalog to index its books and others. After some period of time, computers were used to automate this card cataloging "(Wallace, Patricia M. (1991)).As the

internet is becoming more advanced & libraries are demanding more and more automated facilities, new and powerful ILSs required by various companies.

Today's ILS softwares can do various tasks at a time, for example, acquisitions, cataloging, tracking newspapers and magazines and others. And, most of the jobs are web based. Any authenticated user can operate these software from anywhere in the world. That means, major ILS systems now offer web-based portals where library users can log in to view their account, renew their books, and be authenticated to use online databases. In any integrated library system there are generally two interfaces, one is for patrons and another is for administrators. In library system the operation of a user/member/patron and staff of library are different. A user can search a book, view available book list, can issue book, renew book, can hold book, can print issue list, can edit his/her information (patron information). But a staff can store bibliographic (book, CD, DVD, journal etc) records. Staff can actually store library materials record in database, can create patrons in the database, order a book, purchase a book, can check the price list and others.

Basic features of an Integrated Library management System include:

1. Functional Modules (as per requirement).

Basic Modules: Acquisition, Cataloguing, Circulation & OPAC, Add on Modules: Serial Control, Interlibrary Loan (ILL) and Web OPAC etc.

2. Operating system:

Preferably Linux and Windows environment

3. Database system:

MySQL, Oracle, Informix etc.

4. User Interface:

Graphical User Interface (GUI)

5. Library Automation standards

A compatible standard such as MARC and Z39.50 protocol

1.2 Problem statement

Presently, a manual system for managing the library is employed at the Chapman library. What exactly is done here is that the persons who like to get the benefits of the library have to fill the membership form and then they are provided with an identity card. Members have to bring their identity card each time they want to borrow a book or they want to read the book in the library itself. In this process each transaction is to be noted down in specified registers and then signed by the member and the library attendant. The books available and those that have been borrowed are also recorded in different registers.

Records of books and borrowers, records on issued books and checking of books are carried out manually. If the library is large in terms of its materials, then handling becomes a challenge. Manual record keeping is not reliable as people tend to forget a lot of things.

Also, keeping a lot of maintenance workers is not cost effective. On the borrower's part, searching for a book is more tedious in a manual system as books are usually not ordered well. A user might be searching for a book that is not even available. This can be very hectic and stressful to both users and managers.

At Christian Service University College, about fifty percent of the student population is made up of evening students who work during the day. These students have limited access to the library as the library closes at 8pm. If an evening student wants to borrow a book from the library, he/she would not get enough time for the searching process. It may also be a waste of time as the book may not even be available. It would be convenient for these students to have a search facility that can help them know the books available and to make reservations at the comfort of their homes or work places. It will also be helpful to provide students with e-mail or text messages on reservation and returning of books. It is therefore prudent to have a reliable way to manage a library system.

1.3 Research Questions

The research will be carried out with these stated questions in mind. These questions are:

1. Who are the target groups to use the outcome of this research?
2. Who are the stakeholders of this research?
3. Are there any existing systems?
4. Can the proposed research produce a system that can be integrated with existing systems?

1.4 Methodology

A project of this nature would have cost a lot of money using proprietary software tools but thanks to open source technologies the cost is relatively reduced. Open source software tools like koha, linux, Mysql, etc will be used alongside some few proprietary tools like XAMPP, Microsoft Office Edition, etc

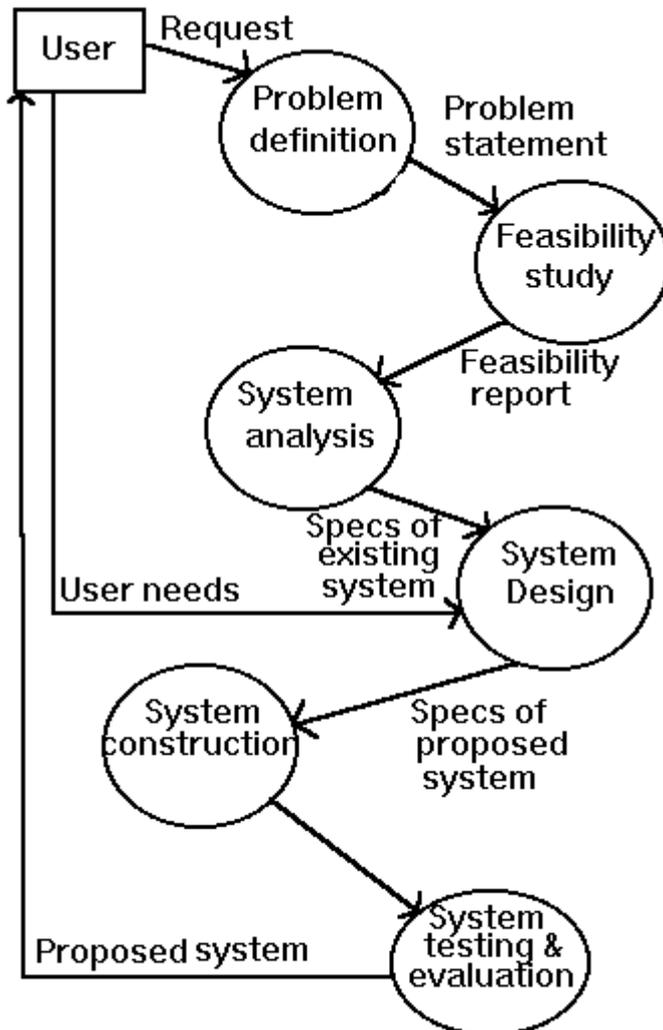
Waterfall Methodology for Information Systems Development

The design of an information or computer system requires considerable organization and management; a planned approach needs to be taken to define how the development and implementation needs to be performed ('Systems design and life cycle', 2008). Winston and Hoffman (2005) explain the Waterfall Methodology applies the principle that the development process should be divided into phases to provide clarity of content. Results of each phase are documented and the next phase only begins when all pre-requisites are satisfied. It is not permitted to return to a previous phase, once another has started unless the implementation requirements change. The project is completed when all phase gate reviews are satisfied. Requirements change must be tracked and controlled so as to reduce scope creep.

The phases for a development of a system using the Waterfall Method are typically as follows (Systems design and life cycle, 2008):

1. Feasibility study: benefits, cost estimates, effectiveness from a new or improved system need to be determined.
2. System requirements: existing system is analyzed and requirement specifications from the system owner are gathered.
3. System design: involves the technical specification produced for the new system based on requirements.
4. Design Implementation: work begins on the development or production of the new or improved system.
5. Testing and Installation: protocols for testing verification and proper installation are performed.

- Maintenance: after the system is implemented, operational modifications could be made to fit new requirements.



Systems Development Life Cycle (SDLC)

Figure 1: Dataflow Diagram for SDLC

1.5 Scope of the study

The proposed system is meant for;

1. Christian Service University College (Bill Chapman) library.
2. Any other educational institution can make use of the system.
3. It can be used in offices and modifications can be easily done according to requirement.

The system is built for Chapman library and so it will store information of all books and records of users of the library. Only the librarian or administrator will have specified access and as such can handle administrative functions of this library system.

1.6 Justification of project

Jim Rettig President, ALA, (American Library Association) 2008-09, describes libraries as “the only providers of universally accessible lifelong learning opportunities. School libraries are unique but they are also part of a much wider information landscape. The school library is an ideal place to learn about the way that libraries work and how to use libraries. For some students their school library will be their first experience of a library.

The school library can connect with other libraries, including public libraries, for a diverse range of information resources.

The International Federation of Library Association’s (IFLA) Manifesto states that “The school library provides information and ideas that are fundamental to functioning successfully in today’s information and knowledge-based society. The school library equips students with lifelong learning skills and develops the imagination, enabling them to live as responsible citizens” (2008). The school library is central to learning and plays a key role as a place for encouraging innovation, curiosity, and problem solving. The Chapman library is a

catalyst for literacy and reading and for teaching and scaffolding inquiry learning. School libraries make a difference to students' understanding and achievement and provide support for teaching and learning throughout the school. The school library is an important part of the school community and reflects and welcomes this community.

Bill Chapman library therefore plays a key role in the cultural and social life of the school. It can be a central point for engagement with all kinds of reading, cultural activities, access to information, knowledge building, deep thinking and lively discussion.

School libraries will always exist as places for learners to find information, resources, services, and instruction. But formats, technologies, learning needs, and our schools are evolving. And so are students themselves. Our entire information and communication landscapes have shifted—and this shift will only continue.” Valenza & Johnston (October, 2009) *School Library Journal*.

This project is needed in order to bring to bear how users of Chapman library (CSUC) can have unlimited access to the library and to have a reliable search facility. It is also to help the librarian to manage the activities involved in a library in an efficient and reliable way. This is to introduce an efficient way of managing the library with less managing personnel and easy searching mechanisms.

The project is therefore aimed at developing a system that can handle and manage the activities involved in CSUC library in more efficient and reliable way by implementing a robust and flexible integrated library system, supporting the academic, research & administrative needs of students, faculty, patrons & staff.

CHAPTER TWO

2.0 Literature Review

The mention of a library would bring back memories of a room that's stuffed with books of all kinds. The lingering aroma of old paper back and hardcover books piled up on shelves. When we imagine a library we are always reminded of the age old methods of maintaining registers and ledgers for books and an equally complicated system for the giving away of books for reading. According to the online dictionary for library and information sciences (Reitz, 2004), the word library comes from the Latin *liber*, meaning "book." In Greek and the Romance languages, the corresponding term is *bibliotheca*. It is a collection or group of collections of books and/or other print or non print materials organized and maintained for use (reading, consultation, study, research, etc.). Institutional libraries, organized to facilitate access by a specific clientele, are staffed by librarians and other personnel trained to provide services to meet user needs. By extension, the room, building, or facility that houses such a collection, usually but not necessarily built for that purpose.

Many researchers have been done in this area and several definitions have been given for integrated library systems. An integrated library system (ILS), also known as a library management system (LMS) or as library automation, is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed.

Jeesh Muake in his article dated October 15th, 2009 stated that a library management system is an ERP system also known as Integrated Library System. This is a program that enables a complete running and functioning of a library and the several aspects of its work.

According to UNESCO an ILS is "an automated library system that is capable of managing the operations of more than one basic library functions". Integrated library management system is a system which can keep all tracks of a library operation such as items, billing, tracking various items owned by library like books, journals, magazines, DVDs and so on, orders or reservations made by various faculty staff and students and also even patron management. A library management system is also defined by the online dictionary for library and information sciences as an integrated set of applications designed to perform the business and technical functions of a library, including acquisitions, cataloging, circulation, and the provision of public access. In alphabetical order, the leading vendors of library management software are: Auto-Graphics, EOS International, Ex Libris, Follett, Innovative Interfaces, Polaris Library Systems, SirsiDynix, TLC, and VTLIS. It is synonymous with *integrated library system (ILS)*. (Reitz,2004)

An Integrated Library System usually comprises a relational database, software to interact with that database, and two graphical user interfaces (one for patrons, one for staff). Most Integrated Library Systems separate software functions into discrete programs called modules, each of them integrated with a unified interface. Examples of modules might include:

1. acquisitions (ordering, receiving, and invoicing materials)
2. cataloging (classifying and indexing materials)
3. circulation (lending materials to patrons and receiving them back)
4. serials (tracking magazine and newspaper holdings)
5. the OPAC (public interface for users)

Each patron and item has a unique identification in the database that allows the system to track its activity.

Larger libraries use ILS to order and acquire, receive and invoice, catalog, circulate, track and shelve materials. Smaller libraries, such as private homes or small organizations and institutions (e.g. churches and synagogues), often forgo the expense and maintenance required to run an ILS and instead use a simpler library computer system which has limited functions.

In recent years, general information retrieval systems have become more advanced. Search engines such as Google and online sellers such as Amazon have created user-friendly interactive systems which appear more attractive to users. Library communities are also making efforts to develop more sophisticated, user-friendly systems equipped with federated search engines. A federated search engine can retrieve information from multiple subscription based databases (deep web), library holdings, and general web sources with one search query. Library communities are also increasingly looking into open source program.

The library management system consists of the following:

-) A relational database
-) Software that interacts with the database
-) Two graphical user interfaces
-) One of these is for the library staff
-) The other one is for the borrower
-) The User and Library Systems

The application of the library system program allows a specific user id and password to the user. The ID of the individual users allows the library staff to keep a track of their accounts and activities.

History of Integrated Library systems

Integrated library systems (ILS) were often known as library automation systems or automated systems in the 1970s and early 1980s. Computers were used to automate the card catalog, thus the term automated system. Automation of the catalog saves the labor involved in re-sorting the card catalog, keeping it up-to-date with respect to the collection, etc. Other tasks automated include checking out and checking in books, generating statistics and reports, acquisitions and subscriptions, indexing journal articles and linking to them, as well as tracking interlibrary loans. As the Internet grew, ILS vendors offered more functionality related to the Internet. Major ILS systems now offer web-based portals where library users can log in to view their account, renew their books, and be authenticated to use online databases.

Brief descriptions of some of the LMS available

In this section brief descriptions will be given of some of the LMSs used in UK libraries between 1991 and 2000. Further details are provided in the excellent directory of 30 LMS compiled by Leeves with Russell through funding from the British Library Research and Development Department (BLR&DD) under the auspices of the Library Information Technology Centre (LITC) at South Bank University in London. The LITC was a centre which, in 1991, moved from its former base at the Polytechnic of Central London to the then South Bank Polytechnic. LITC was funded by the BLR&DD to offer impartial advice on LMSs and general automation projects to librarians and information professionals. Staff at

LITC were involved in a number of activities related to LMSs including the production of briefing documents, guides , introductory packs (e.g. for special sectors, such as school libraries), providing consultancy advice to individual libraries choosing a new LMS, being involved in funded research work and publishing the journal *Vine*. The Leeves with Russell directory was based, in part, on an earlier directory (Leeves et al.) of some 29 LMS in Europe; of these over 50% referred to LMS used in UK libraries at that time. Other references to case studies describing particular implementations have, in the main, been taken from the journals *Program: electronic library and information systems* and *Vine*.

ADLIB

This LMS was initially developed in the 1980s by Lipman Management Resources of Maidenhead and in the 1990s was supplied by Adlib Information Systems. Leeves with Russell record 11 users of ADLIB in the mid-1990s most of which, ten, were special libraries. An example of a library and information service implementing ADLIB is provided by Wilsher who describes the decision made by the Advisory, Conciliation and Arbitration Service (ACAS) to choose the catalogue, OPAC and acquisitions modules of this system to replace the previous Bookshelf system used when ACAS was part of the UK government's Department of Employment.

ALEPH 500

Ex Libris developed its first LMS, the forerunner of the ALEPH 500 system, for the Hebrew University in Jerusalem in the 1980s and it became a popular system in Europe. The first customer for ALEPH 500 in the UK was King's College London (KCL) which, in 1996, was looking for a new LMS to replace the soon to be defunct LIBERTAS system. Sudell and Robinson describe that procurement process and explain how its use of industry standards

(Unix, Oracle, Windows, SQL etc.) was one of the major reasons for its being chosen for King's. Many other academic libraries followed KCL in choosing ALEPH 500 including Bristol, as described by King.

ALS

Automated Library Systems (ALS) is a British company that has been involved with computer-based library systems since the late 1960s when it developed a special device based on punched paper-tape for automatically recording details of books and borrowers at a library's issue desk. During the 1990s the suppliers developed a version of the ALS System 900 which would run on open systems platforms (as opposed to the previous proprietary hardware and software solution) as well as dealing with Electronic Data Interchange (EDI) developments in the acquisitions module. Ashton describes how EDI with ALS was used at Hertfordshire Libraries Arts and Information Service.

CAIRS-LMS

The Computer Assisted Information Retrieval System (CAIRS) was initially developed as an in house information retrieval system for the Leatherhead Food Research Association in the mid-1970s. CAIRS-LMS was developed to complement this and was used by those libraries in the 1990s which typically had sophisticated information retrieval requirements and comparatively low numbers of loans. Perrow describes the upgrade from the microcomputer version of CAIRS (MicroCAIRS) to CAIRS-LMS at Templeton College. Leeves with Russell record 218 users of CAIRS-LMS, the vast majority of which were special libraries. Bennett and Tomlinson describe the use of the interlibrary loans module of CAIRS-LMS at the library of the Institutions of Electrical Engineers.

DataTrek

This LMS originated from software developed in the US but by the 1990s some UK special libraries were using it. Hoey, for instance, describes its implementation at the Royal Society of Chemistry (RSC). As similar learned societies, the RSC had been using online information retrieval system since the 1980s and by the 1990s realised the need for a complementary LMS. In 1996 DataTrek, by then part of the Dawson Holdings group, acquired Information Management and Engineering (IME) the producers of the Tinlib software.

Dynix/ Horizon

The history of Dynix up to the early 1990s is provided by Gilmartin with Beavan who were responsible for implementing this LMS at Glasgow Caledonian University. The original Dynix LMS was developed in the US in the 1980s and Leeves with Russell state that there were 68 users of this LMS in the UK in public, university, small academic/college and special libraries. During the 1990s a client-server LMS, Horizon, was marketed by the firm Ameritech Library Services, which had merged with Dynix during the 1990s. Hackett and Geddes describe the Horizon LMS noting that it was truly scalable with installations in small special libraries as well as large multi-site academic libraries, although they also note that it might have been argued that Horizon was marketed too early in the UK in 1995, when the product lacked depth of functionality required to deal with the needs of large multi-site universities. However by 1998, when universities including Huddersfield, Middlesex, Staffordshire, Strathclyde and Birkbeck College, University of London had implemented Horizon the feeling was that customers were “beginning to reap the benefits of its fully graphical, client/server construction”. In 2000, Ameritech Library Services became known as epixtech Inc. and continued to supply existing products as well as web-based solutions and services.

Galaxy

The Galaxy 2000 LMS, from the British firm, DS proved to be a popular system, particularly in public libraries, during the 1990s. Neary describes how Birmingham Library service, the biggest metropolitan library authority in the UK with 40 community libraries and the busiest lending library in Europe installed the Galaxy 2000 LMS in 1994 and the upgraded it to a newer version in 1999. Galaxy 2000 offers the usual LMS modules but also has a separate issuing function for use of the Birmingham's housebound service. The OPAC module of Galaxy is known as View Point and there have been some 230 View Point terminals located throughout Birmingham since 1994.

Geac

This Canadian firm Geac first installed its Geac Library Information System in a UK library in 1979 and this software ran on proprietary hardware and was used in several UK libraries in the 1980s. In 1988 Geac acquired an American company, Advanced Libraries, and developed its software, ADVANCE, to run under the Unix operating system and this became its main LMS offering in the 1990s. For instance, in the mid-1990s Edinburgh University upgraded its previous Geac (Geac 9000) system to ADVANCE, Newcastle University chose this system as did the public library at Hamilton District Libraries in Scotland, the National Library of Wales and the Bodleian Library at the University of Oxford. A history of library automation at the Bodleian, including the implementation of the DOBIS/LIBIS system in the late 1980s is provided by Crawshaw and Burnett describes the 1995 decision to migrate to ADVANCE along with an assessment of the impact of automation on such a large organisation and a catalogue of some eight million items. Geac ADVANCE was the basis for the Oxford Library Information System (OLIS) that provided library housekeeping services for many of the Oxford colleges, academic libraries within the university as well as the

copyright library. During the 1990s Geac also acquired CLSI and its LIBs 100 LMS and marketed this for some time.

Heritage

Heritage, like Genesis, was developed from the original Bookshelf software although Heritage was initially a single-user system, and was marketed by Logical Choice (which became known as Inheritance Systems during the 1990s) in Oxford. Alper describes the implementation of Heritage in a small one-librarian medical service and concluded that this LMS had proved to be a great time-saver in issuing and claiming books and had excellent statistical reporting facilities. In 1997 the library at the Central School of Speech and Drama, having outgrown its previous LMS, needed a new system. Edwards describes the selection process for this new system which resulted in a short list of four LMS ranging in price from £3,000 - £27,400. Heritage was chosen (at a cost of £11,350) and the paper describes some of the innovative features of this LMS.

INNOPAC/ Millennium

Innovative Interfaces Inc. (III) is an American company which started to market the INNOPAC LMS in the UK in the early 1990s with the first customer being the library at the University of Wales, Bangor. In 1995 staff at the University of Hull, as described by Leeson, chose INNOPAC to replace the previous Geac 9000 as it had improved functionality. In 1997 III acquired the UK company SLS and its LIBERTAS software. Towards the end of the 1990s III started to develop its Millennium system which, inter alia, provided a web-based interface for each module. Users of Millennium in the UK included Sheffield Hallam University, St. Andrew's University, and St. Mary's University College in Twickenham. The School of Oriental and African Studies at the University of London chose Millennium

because of its proven ability to deal with Chinese, Japanese and Korean material. Myhill provides a personal insight into the challenges faced at the University of Exeter in migrating from the LIBERTAS LMS to Millennium.

LIBERTAS

The stand-alone LMS LIBERTAS, of SLS, was designed with assistance from many of the systems librarians who were working in the libraries of member universities of the SWALCAP co-operative. LIBERTAS was launched in 1986 and initially incorporated modules for cataloguing, OPAC, and circulation control. Leeves with Russell report 46 users of LIBERTAS in UK libraries by the mid-1990s. Bradford outlines the advantages and disadvantages of using the ILL module of LIBERTAS at Bristol University, which was an original member of SWALCAP. In 1997 SLS was sold to III and support for the LIBERTAS system declined.

OLIB

Smith describes how the Bar Library in Belfast which serves all practising barristers in Northern Ireland implemented the OLIB LMS from the British firm Fretwell Downing in 1996. The requirements for this special library included the need to provide a document management/delivery service for members as well as an efficient system for managing the library. Initially the Bar Library used the cataloguing, circulation and OPAC modules of OLIB with the intention of implementing the acquisitions and serials modules at a later date.

Talis

The other early co-operative for library automation in the UK was BLCMP- or Birmingham Libraries Co-operative Mechanisation project. Like SWALCAP it had developed stand-alone software for its members which, in the early 1990s, was known as BLS – BLCMP’s Library System- and included modules for acquisitions, OPAC, circulation control and serials control. In 1992 BLCMP announced a new Unix-based system known as Talis. Like LIBERTAS, Talis had been designed in conjunction with the co-operative’s member libraries. It was based on a modular principle using computing industry standards for an open systems design. Among the early users of Talis were the John Rylands Library of the University of Manchester and the public library of the Royal Borough of Kingston upon Thames. Leeves with Russell report 30 users of Talis in the mid-1990s, most of which were university or public libraries in the UK. Wilson describes the experiences of migrating from BLS to Talis at Nene College, the first institution to undertake this migration and produced a lengthy list of ‘morals of migration’. In 1999 the organisation supplying Talis ceased being a co-operative of member libraries and became a commercial company. This decision followed much consultation with the members of the co-operative and the new company stated that strong customer relationships and customer focus would remain central to the culture of the business.

Tinlib

Tinlib, also known as the Information Navigator, was developed by the British firm IME in the 1980s. It was one of the earliest systems to offer a navigational facility and to make use of Windows for display and selection of data. Leeves with Russell report that there were 315 users of Tinlib in the mid-1990s in the UK although a full customer list was not supplied. Chappell and Thackeray outline the need for an automated system to replace the existing

manual systems at the library of the Arts Council of Great Britain and how the use of Tinlib had increased the effectiveness and efficiency of the library and made its collections much more accessible.

Unicorn

Haines describes her experiences during 1990 in attempting to negotiate the acquisition of an American system, Unicorn, from the Sirsi Corporation, which was previously not available in Europe, for use in a British independent health fund, the King's Fund. Sirsi was determined not to enter the European market without a partner with expertise in library software support and with the necessary technical skills in Unix systems. This was finally achieved and the system was successfully launched in the UK in 1991. Leves with Russell reported some 37 users of Unicorn most of which were medical, legal or government libraries. Cree, for instance, outlines how Unicorn was introduced into the UK government's Department of Health library where it needed to be integrated with the Department's office information system and added to a large network with multiple applications. By the end of the 1990s Unicorn was used in a variety of libraries including the Cheltenham and Gloucester College of Higher Education, the London School of Economics, the Royal College of Nursing, the Royal Veterinary College, and the library at the Natural History Museum.

Voyager

Endeavor Information Systems was formed in the US in 1994 and its first product was its Voyager LMS. The Web Voyage module of Voyager allows web browsers to query the Voyager database, which is based on the Oracle relational database management system. Voyager became the LMS of choice for a number of libraries looking for new systems following the demise of LIBERTAS. In Wales, for instance, the university libraries of

Aberystwyth, Cardiff, Lampeter and Swansea as well as the Welsh College of Music and Drama were all faced with choosing a new system and they decided to approach the selection process in a consortial way, as described by West. Each institution was free to choose its own system following the selection process. In the event all chose Voyager from Endeavor and these systems were implemented, with differing OPAC interfaces in 1999. Knights outline the procurement and migration experiences at Hertfordshire University Library in moving also from LIBERTAS to Voyager.

Inevitably not all the LMSs offered all modules in a way that satisfied all staff in libraries. In the 1990s there were some examples of libraries which had one LMS for most of its applications but used another for a specific function. For instance, Edwards describes that although Croydon Libraries had automated its circulation and stock control procedures for many years a decision had been made to delay the automation of the acquisitions processes as the LMS in place (CLSI's LIBS 100) did not satisfy the needs of the acquisitions staff. In 1997 the acquisitions module from ALS's Meritus LMS was used, in conjunction with a network solution for EDI ordering and invoicing was implemented. The requirements for interlibrary loans (ILL) within the UK which for many libraries involves the use of the centralised British Library's Document Supply Centre have not always been met by LMSs, particularly those developed outside the UK. Leves describes solutions for automating ILL in the early part of the 1990s and Prowse describes the process of developing an ILL module for the ALEPH 500 LMS that had been installed at KCL.

Proprietary and Open-source ILS

An open-source software (OSS) is computer software that is available with source code: the source code and certain other rights normally reserved for copyright holders are provided under an open-source license that permits users to study, change, improve and at times also to distribute the software. Open source software is very often developed in a public, collaborative manner. Open-source software is the most prominent example of open-source development and often compared to (technically defined) user-generated content or (legally defined) open content movements.

A Proprietary software or closed source software is computer software licensed under exclusive legal right of the copyright holder. The licensee is given the right to use the software under certain conditions, while restricted from other uses, such as modification, further distribution, or reverse engineering.

Evergreen is an open source, consortia-quality Integrated Library System (ILS), initially developed by the Georgia Public Library Service for PINES (Public Information Network for Electronic Services). Evergreen development began in 2004, when GPLS determined that no available ILS software could meet the needs of PINES. Evergreen 1.0 went live in September, 2006.

KOHA, created in the year 2000, was the first open source ILS, and is currently being used in over 300 libraries worldwide in dozens of different languages (State Library of Ohio, 2007). While KOHA was developed on the Linux, Apache, MySQL, Perl (LAMP) platform, it also runs on Windows and MacOS. KOHA includes several advanced features such as budget-based acquisitions, serials management, and MARC authorities control along with the ability

for enriched bibliographic content that includes jacket covers, reviews, ratings and descriptions from Amazon.com (Bisson & Eby, 2007).

KOHA was initially developed for Horowhenua Library Trust and was primarily aimed at small to medium sized libraries. As the popularity of KOHA has grown, KOHA has responded by expanding the system for use in large libraries, including the Near East University in Cyprus, which contains over two million titles and lastly a recent adopter has been the Guggenheim Museum Library (“Guggenheim museum chooses KOHA”, 2007) in New York. Currently, software providers alongside library technology staff from around the world contribute to the maintenance of KOHA (Bisson & Eby, 2007).

KOHA is an open source project. This means that its source code is open. Anyone can develop from anywhere of the world in any time. And, with the help of open source developers, now KOHA is known as the most powerful ILS of the world of information and library system. Moreover, KOHA has some advantages over other ILS. Some of the advantages of KOHA include:

Full-featured Integrated Library System

KOHA can be used in any kind of library whether big or small. It is a true enterprise class ILS with various features. KOHA includes modules for circulation, cataloging, acquisitions, serials, reserves, patron management, branch relationships, and more.

Dual database design

KOHA uses two database design, which makes it more stable & industry standard. It supports both text based and real time database management system.

Library standards compliant

KOHA is capable of the interoperability between KOHA and other systems and technologies, while supporting existing work flows and tools.

Web based interface

KOHA has a very user friendly web based interface. And it is using all the cutting edge web technologies like XHTML, CSS & Javascript.

No vendor

KOHA as an open source project has no vendor lock in here. That means, anyone can participate & develop KOHA in any time.

Robustness

The public front-ends should be sufficiently stable to avoid a situation where a poorly done operation (badly formed query, etc) could bring down the system.

Usability

The online public access catalog (OPAC) had to be immediately useful to the walk-up patron.

Basic performance

The average query had to be handled quickly enough to meet expectations (while difficult to assign a metric, feedback on this would be continuous if this aspect was neglected).

Downtime

Business hours downtime had to be minimized. The collection management system is the principal application for circulation of materials, and if offline effectively cripples a library. However, after hours maintenance or clearing routines are generally acceptable, but 24 hour access to the catalog is preferable.

Back office

"Back office" needs had to be addressed: Almost no library collection is static, so performing basic accession and de-accession operations needed to be supported. It is acceptable for these functions to require some initial training.

Inventory: Inventory vehicle and reporting system were needed.

Advantages of Open Source Software

Ability to tailor to fit local needs:

The availability of the source code means that a user can modify and enhance the software to more closely fit its own needs.

No restriction on use:

There are no contractual restrictions on how the software is used.

Low cost:

There is no charge for the software itself. The major cost is local development. If the number of users is large, and they share their efforts, each user's cost is reduced.

Disadvantages of Open Source Software

Unanticipated Effort:

A library may find that it needs to do a great deal more work than anticipated to adapt the software to local needs.

Lack of coordination:

The decentralized development of open source software means that progress can be chaotic and there may be delays in addressing bugs.

Inadequate technical support :

Documentation tends to be limited and aimed at developers. There usually is limited technical support, especially for users of the software

Customization:

Open source software may not offer the level of customization as it is being done in case of commercial software.

Advantages and Disadvantages of Koha

The advantages of Koha include:

- J Actual software is free (www.koha.org/).
- J Supported by a community of highly motivated individuals (Breeding, 2008/2009).
- J Gain functionality at a rapid pace.
- J Anyone can access the source code and make modifications (www.koha.org).
- J Changes can be made at the local level.
- J Next-generation user interface for OPAC (Yang & Hoffman, 2010).

- J Can meet the needs of smaller rural libraries that cannot afford proprietary systems.
- J Free from dependence on vendor lock-ins (www.koha.org).
- J No restrictions on use (Jones, 2009).
- J Supports the mission of libraries.

The disadvantages are:

- J Relatively new and unproven
- J Current focus may be on improving functionality rather than greater innovation (Breeding, 2008/2009).
- J There may be unanticipated work load as adaptations are made to fit local needs (Jones, 2009).
- J Decentralized development may lead to chaotic progress and delays in fixing bugs (Jones, 2009).
- J Customization may not be as great as commercial software (Jones, 2009).
- J Currently unfeasible for the larger and more complex libraries (Breeding, 2009).

Koha is an integrated software system with all the required models for small to very large libraries. It is an automation project which will serve as a model for any library. Being an open source, any library wanting to go for automation for their library housekeeping operations can make use of this software.

Who uses Koha?

More than 300 libraries are using Koha, including academic, public, school and special libraries, in Africa, Australia, Canada, USA, France, India and, of course, New Zealand. Along with a committed team of programmers its development is steered by a growing community of libraries collaborating to achieve their technology

Overview of Existing System

The existing system which is a manual system presents a lot of problems though it has some benefits. The few benefits include

1. As the work load is heavy more staffs are appointed; less unemployment
2. The materials required are very inexpensive so this will save lot of money which is used up in buying expensive materials.
3. The chance of misusing the data is less as the records are kept in a filing cabinet and the key is with the librarians and the session supervisors.

The disadvantages on the other hand include:

1. Requires more staff, so more salary has to be given.
2. Filing cabinets are needed to store the records so the space in the library will be less.
3. It is time consuming when searching the library card as they are not ordered in a regular manner.
4. Errors are made while calculating the fine; no separate column for fine calculation and the book returned after the due date.
5. The librarian faces difficulties in searching the books which are not returned as she has to go through the records of each and every student.
6. Mistakes might be done while swapping the library card.
7. If the records are over written the records might be dirty and difficult to understand.

These problems could be reduced by re-organizing the files in the filing cabinet, retraining the staff and increasing the space provided to store records.

FLOW CHART FOR BORROWING IN THE EXISTING SYSTEM

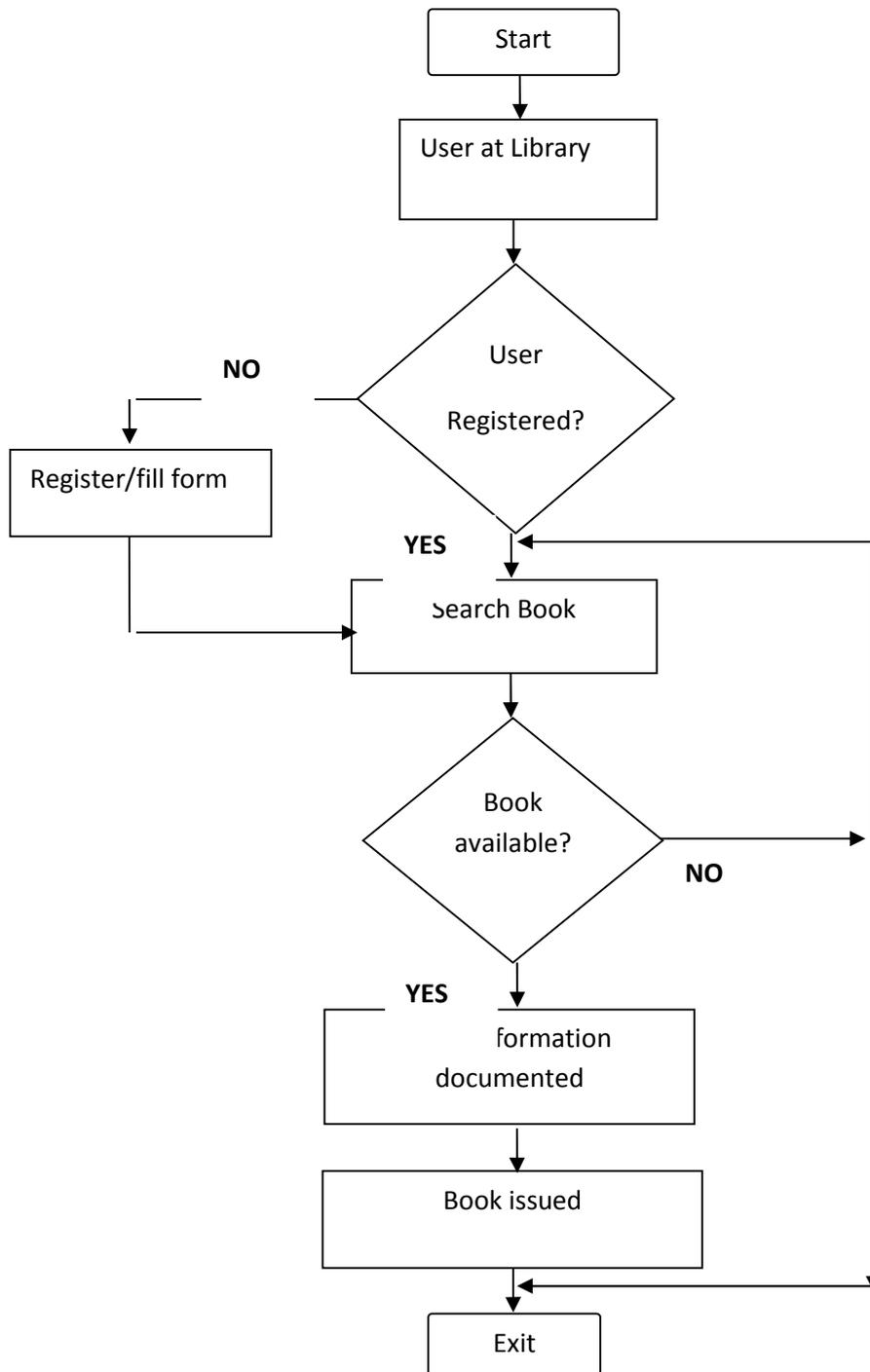


Figure 2

Proposed Solution

The proposed integrated library system often referred to as a Library Management System – is an important tool for Chapman library’s current and future development. The system has several objectives such as;

Reducing mistakes

This can be done by validating data by validation check. Moreover Rang check and Feasibility check can be performed in some fields by computerizing.

Increasing data security

A password will be needed to login to the system. This can protect the records from unauthorized users. The password will be with the librarian and the session supervisors. Taking regular back up By computerizing the system we can take regular backups of the system after every session Update information faster.

The updating of information will be faster than before as the librarian is using a computer.

Reducing filing cabinets

Instead of files the records will be stored in a database. This will increase the space in the library.

The system can also provide reports to support your purchasing decisions, including information on:

-) Popular authors or subjects
-) Status of resources – lost, current, under repair
-) Type of resources – reference, sophisticated picture books, non-fiction

Consistency in data recording will help users find all the relevant information when using an appropriate search term. For example, when adding data to your catalogue records, it is very important that all terms are consistent throughout. Also, if you have a collection of staff resources, you will want to indicate this in every one of these catalogue records.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

Methodology is a body of knowledge that enables researchers to explain and analyze methods, indicating their limitations and resources, identifying their presuppositions and consequences, and relating their potentialities to research advances Miller, (1983) cited in (Limpanitgul, 2009) .

This section deals with the procedure adopted in conducting the research. The issues that are discussed include requirements, the research objective, the study design, the population and the sampling procedure that was used, procedure for data collection and the tools and programming language used.

3.1 Requirement Specification

The specification or functional design is duly undertaken in consort with the potential end users of the software to ascertain why we are doing this, what the application will do and whom it will benefit.

3.1.1 Functional Requirements

The functional requirements developed for this project encapsulates the range of information transaction relating to preservation that occurs across organizational units within the library and across discrete processes and to relate them to a structure set of information management functions.

There are registered people in the system (e.g students, librarian, faculty etc) and each one of them has some exclusive privileges. Below is a list of some functionalities of the system.

A user should be able to

-) Login to the system through the login screen (first page of application)
-) Change password after logging into the system
-) See the status of the books or journals borrowed or reserved by user and the respective due dates
-) Search for a book/journal based on the book or name of the author/subject
-) Reserve an item that is currently borrowed
-) Cancel the reservation made earlier
-) Get help on how to use the different features of the system

The Administrator/Librarian should be able to

-) Include new books/journals or remove some books from the inventory
-) Add/delete/edit new and/or existing users to the system
-) Loan out books
-) Send out reminders to borrowers if items are overdue by email
-) Charge users for misplacing items

3.1.2 Non Functional Requirement

A data model to store and retrieve knowledge embedded in the library catalogue. Non functional requirements for this system include the following:

Safety Requirements: The database may be crushed at anytime due to virus or operating system failure so a backup is required.

Security Requirements: Security includes steps that have been taken to protect the system against both voluntary and involuntary corruption. Access rights are therefore decided depending upon the category of user.

Software Quality Attributes: The system should be user friendly.

System Constraints: The constraints of the system are the elements of the environment into which the system must fit. This may be hardware (installed infrastructure) or software (required OS and development tools).

Supportability: Ensuring ease of installation, configuration and testing to achieve objectives.

3.2 Research Objective

The aim of this research is to implement a powerful and flexible integrated library system, supporting the academic, research & administrative needs of students, faculty, patrons & staff.

This research should be able to

1. Provide a reliable search facility for users.
2. Provide a reliable system documentation for the administrator.
3. Allow users to reserve books for a number of days.
4. Provide e-mail services to users whose books are due.
5. Improve the quality, speed & effectiveness of library service.

3.3 Research Design

A research design typically include how data is to be collected, what instruments will be employed, how the instruments will be used and the intended means for analyzing data collected. A research design is a plan or blueprint that specifies how data relating to a given problem should be collected and analyzed (Amedahe, 2002). Research design may be perceived from five perspectives: Research Purpose, Philosophy, Approach, Design, Time Horizon (Saunders et al., 2000).

The focus group technique is one example of a qualitative research methodology used to explore the opinions, knowledge, perceptions, and concerns of individuals in regard to a particular topic. As we worked towards reaching consensus on our value statements and complete the environmental scan of this project, we outlined, conducted and analyzed the necessary requirements and shortfalls by inviting library staff for multiple brainstorming planning sessions. We used this to incorporate staff expertise, ideas and feedback about the library and its patrons. We also used information obtained from the environmental scan and focus group discussions to create new goals that would help prioritize our library's activities for the future.

3.4 Population and Sampling

Population refers basically to the universe of units from which the sample is to be selected (Ofori & Dampson, 2011). The target population for the study will comprise evening students and library staff of Christian Service University College. We used convenience sampling because we were interested in getting an inexpensive approximation of the truth. As the name implies, the sample is selected because they are convenient. This non-probability method was used to sample some evening students (30 in number) and 4 library staff of CSUC for focus

group discussions and brainstorming sessions to estimate the user requirements and preferences without incurring the cost or time required to select a random sample.

3.5 Tools and Language Used

Koha is web-based ILS, with a SQL database (MySQL preferred) backend with cataloguing data stored in MARC and accessible via Z39.50.

Operating system platform: Linux, Unix.

Programming language: Perl

- Koha version 3.0
- Apache web server, 2.0.58
- MySQL. Relational Database Management System
- Perl modules 5.8.
- Linux (Ubuntu 10.4)Server

CHAPTER FOUR

IMPLEMENTATION AND TESTING

4.0 Introduction

This chapter deals with the functioning of the various modules of the software we have implemented. Firstly, we installed Koha 3.0 on Ubuntu 10.4 after we installed the ground-work for Koha. At this point we configured it and entered a little test data to confirm everything's working. We used the web browser on the Koha server itself rather than trying to access Koha from a different computer.

Though Koha is a single software package, we've actually installed two Koha websites. One is the administrative front-end for library staff and the other is the general OPAC (online public access cataloguing) front-end.

4.1 Koha System Architecture

Koha is based on a client-server architecture.

Network Server: koha can be installed on a server running Linux, Unix, Mac. The recommended operating system is stable version of Debian Linux, although Koha can run on any modern operating system.

Client Workstations: Koha requires only a web browser on the workstation (a graphical browser, or even a text browser for the OPAC). Koha thus functions on PCs running Windows, PCs running Linux, Macs, or even UNIX workstations.

Koha runs over any TCP-IP network.

Koha accommodates low-bandwidth connections. It is completely usable on ordinary telephone line connections. This is more true of the librarian interface than of the public interface (OPAC).

4.2 Koha Standards

- The developers of the product have taken care to adhere strictly to international standards.
- Industry standards: Z39.50, UNIMARC, ISO2709, MARC21.
- For technical standards: the OPAC is "valid XHTML ", and respects the standards of accessibility.
- Web standards recommended by the World Wide Web Consortium.

4.3 Requirements to Operate Koha

- Koha's interfaces are designed with usability in mind and are extremely user friendly.
- Staff and patrons with only basic computer skills have quickly learned to use the system efficiently.
- The cataloguing module requires an understanding of cataloguing practices such as MARC, Z30.50 retrieval tools, how to add holdings information, etc.
- Administrators should know operating system (Linux, etc.)for maintenance, and some knowledge of cataloguing in setting up the system preferences.



Figure 3

This is the Koha login screen for the staff client.

Input your username and password in the text boxes and then hit Login>> just beneath them to access Koha's Staff Client.

4.4 Koha Modules

Koha integrated library management system has several modules including:

-) OPAC
-) Full catalogue.
-) Circulation.
-) Serials.
-) Acquisition.

-) Patron Management.
-) Branch management.
-) Reservations.

4.4.1 Koha OPAC Module

-) Koha provides a full-functioned Online Public Access Catalog (OPAC).
-) OPAC users can carry out searches starting from ten fields (Keyword, Subject, Title, Class, Barcode, author, publisher, etc.). As in the librarian interface, they can order the results according to several criteria.
-) OPAC users who are logged-in members can place reservations on library items.
-) Biblio basket: Logged-in members can select records from an OPAC search and retrieve them by e-mail, either in human-readable form or in an ISO2709-format file. An ISO2709 file can be processed using bibliographic software like End Note.
-) OPAC users can submit suggestions for acquisition. Koha automatically informs the OPAC user (by e-mail) of the action taken on each suggestion.

4.4.2 Koha Members Module

-) The members (borrowers) module makes it possible to manage not only individual borrowers, but also institutions.
-) Each member belongs to a category. The member category defines:
 -) The minimum and maximum ages for members of the category
 - The cost of placing a reservation on an item (when it is applicable in the library)
 - The rules of circulation.
-) By entering the borrower's library card number into the librarian interface, the librarian can:

Implementing An Integrated Library System For Chapman Library (CSUC) Using KOHA

-) See the financial standing of the borrower (charges due). See the borrower's reservations, and his/her outstanding loans. Set permission flags (for the librarian members).

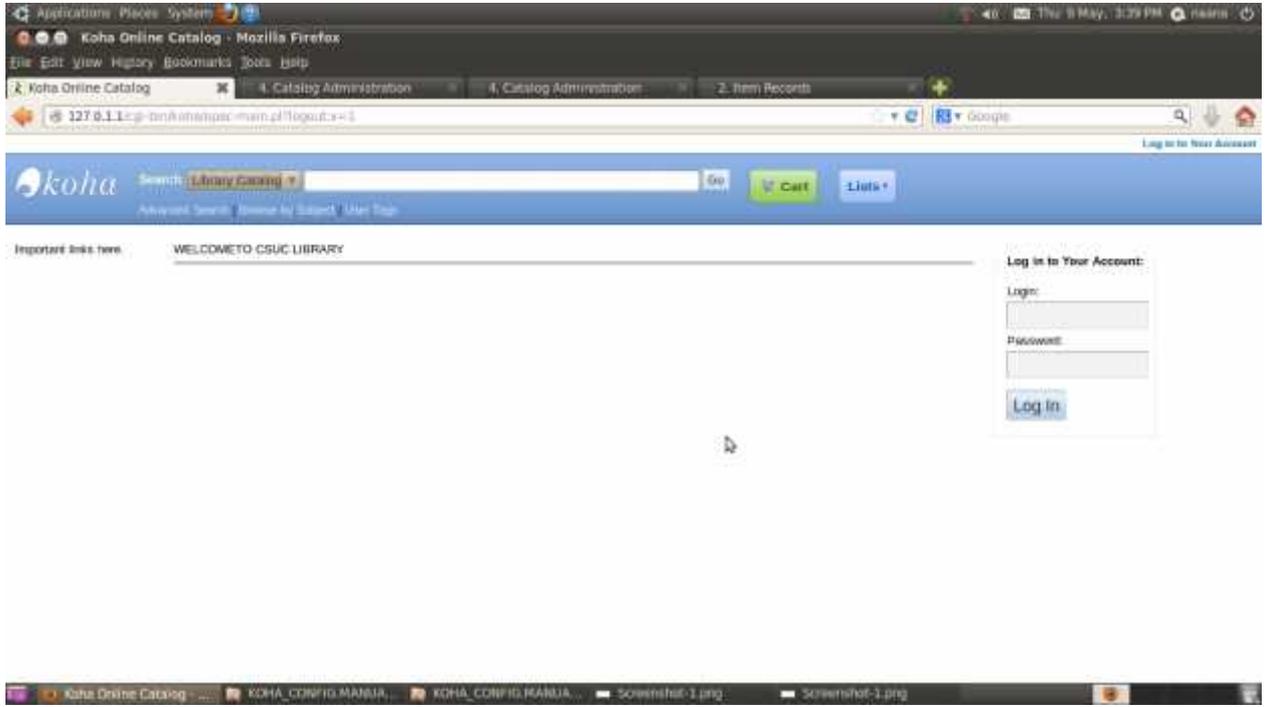


Figure 4.

The figure above is the Koha Homepage where users can log in using their username and password. After Authenticating the user is taking the user details page, captured below in figure 5.

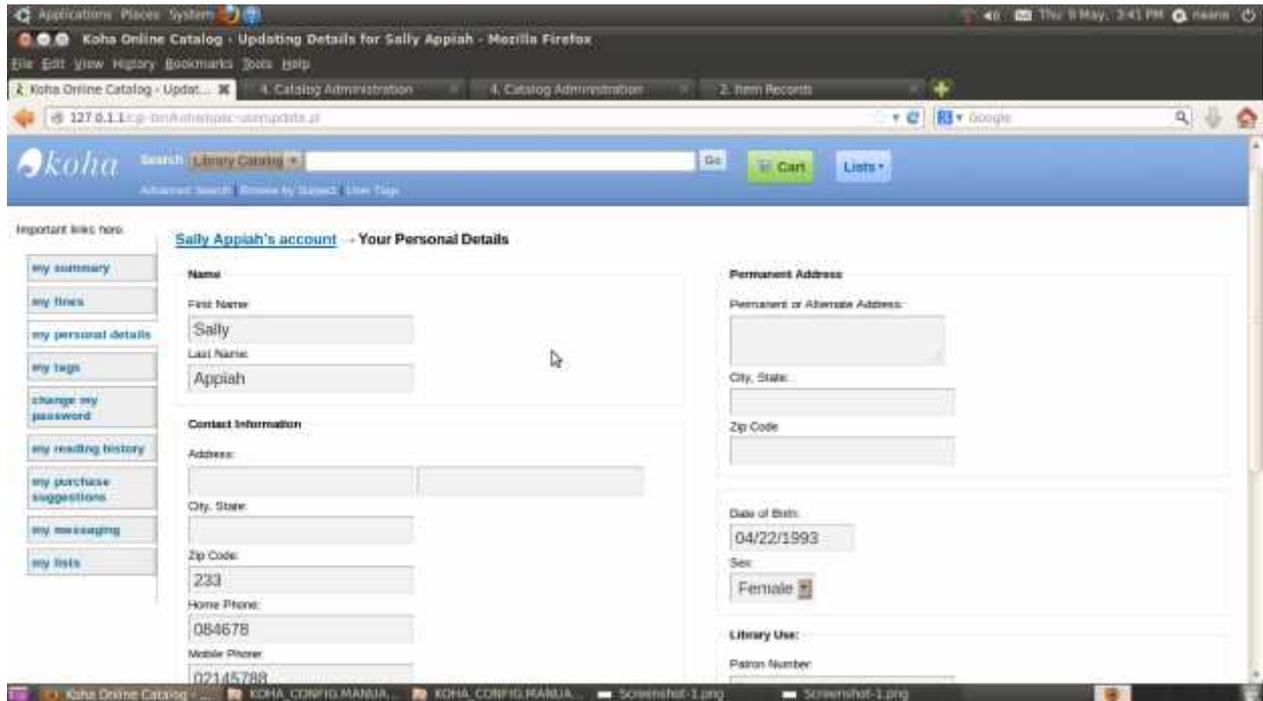


Figure 5.

Figure 5 has various links about the patron. It includes fines, password change (user can change password), my purchase suggestions (users can make suggestions about books that are not in the library to the librarian), etc.

4.4.3 Koha Acquisition Module

Simple acquisitions: The simple acquisitions module makes it possible to acquire materials and add them directly to the catalogue. It does not manage budgetary matters, the orders placed with the suppliers, etc.

Full acquisitions: The full acquisitions module makes it possible to manage budgets and book funds budget available, Committed, Spent Suppliers Orders, via 'shopping baskets'.

Implementing An Integrated Library System For Chapman Library (CSUC) Using KOHA

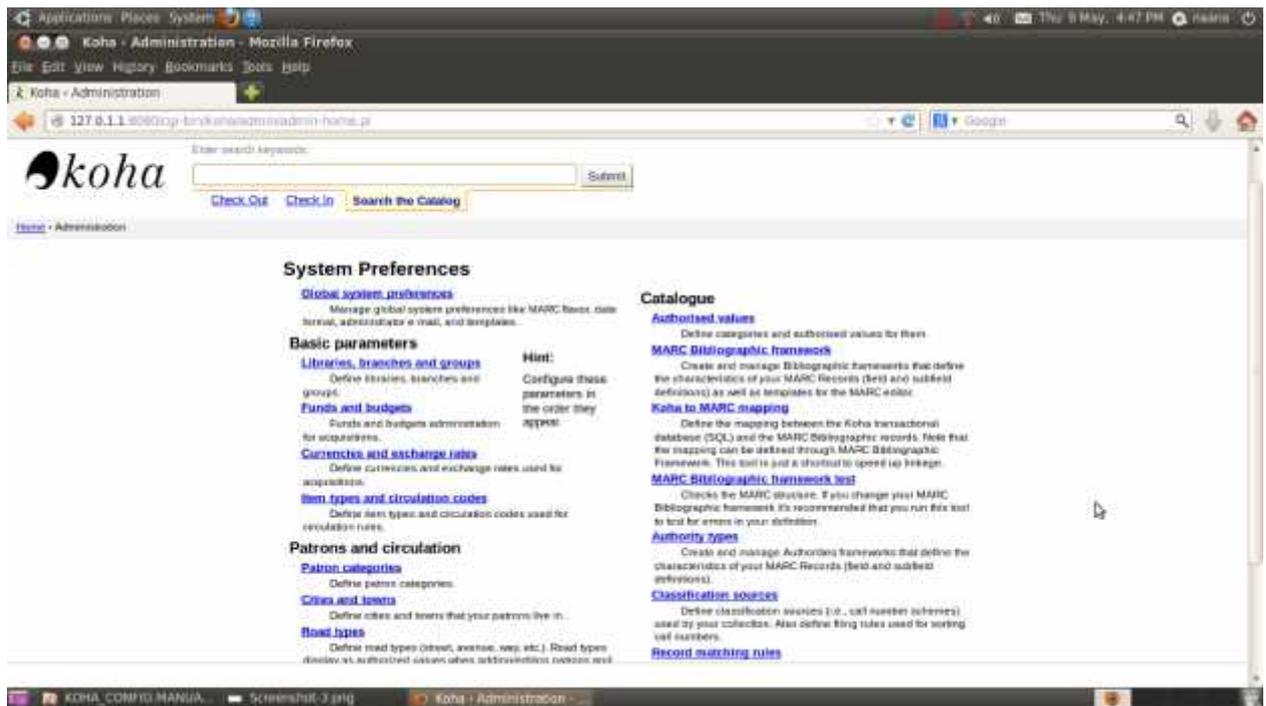


Figure 6.

The figure above is the Koha Administrative configuration page where all configurations for the koha system is done.

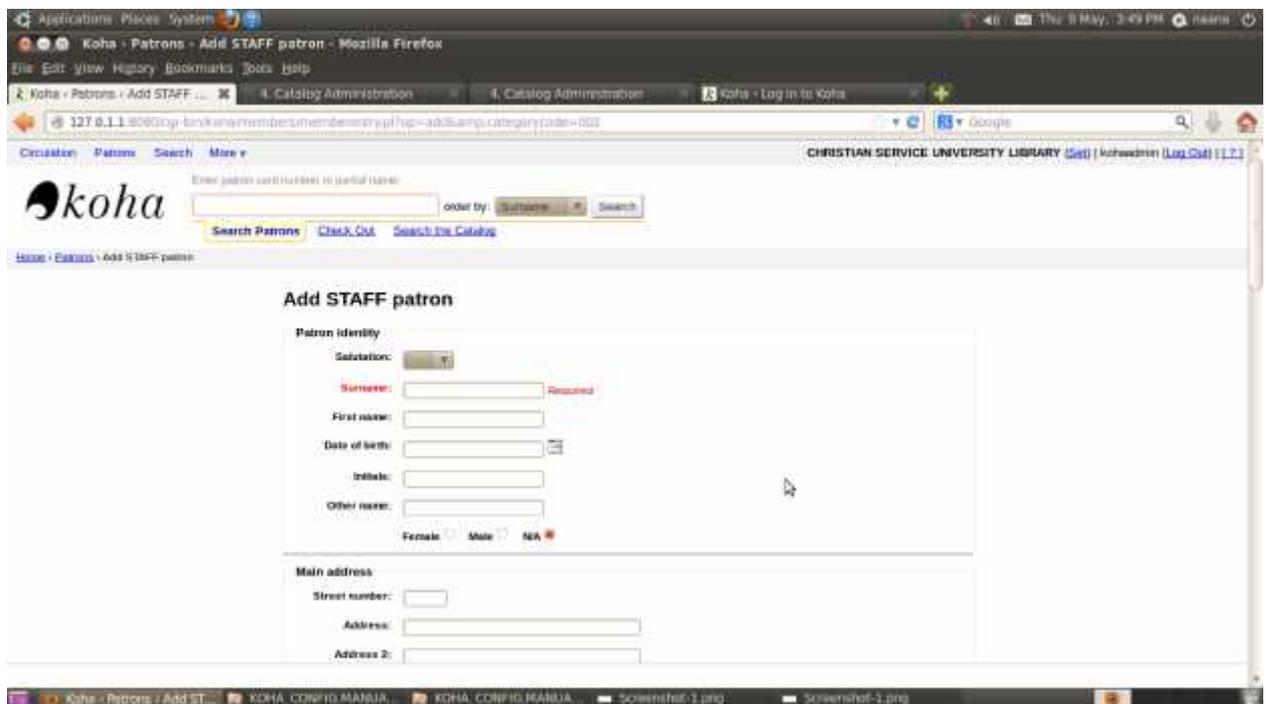


Figure 7.

Implementing An Integrated Library System For Chapman Library (CSUC) Using KOHA

The figure above shows the procedure that is used to create a new patron or user. This can be done by only the administrator or any patron that has the privileges to do so.

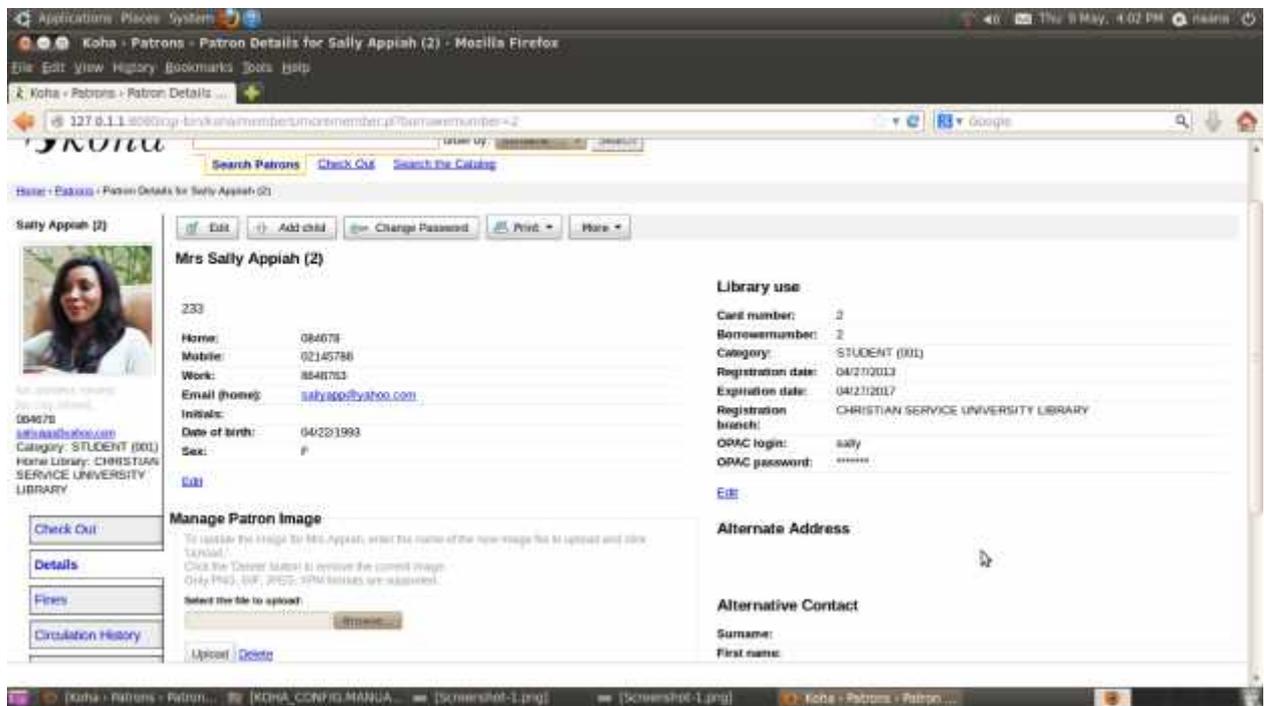


Figure 8.

The figure above enables the administrator or any patron with administrative privileges to manage users. Here, users can be deleted, fines for a user can be viewed, images of patrons can be uploaded and also information about a user can be edited.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Conclusion

The choice of library management programme is constituted by social, economic and or political factors that result in selection of a system that may not suitable for the library requirements, characteristics and functions. Open Source Software (OSS) has revolutionised the modus operandi of library software for library automation. OSS is quickly becoming a solution, owing to the freedom to copy, modify and distribute it and freedom from contracts as well as for greater opportunities for interoperability with other applications.

Computers are capable of introducing a great degree of automation in operations, functions since they are electronic, programmable and are capable to control over the processes being performed. There is a paradigm shift in the role of libraries from mere storehouse of information/knowledge to knowledge disseminations to knowledge providers and further transformed as digital library. Information itself is of no value. It is the use of information that makes it valuable. The role of computers and their associated peripheral media are being increasingly used in library and information services for acquisition, storage, manipulating, processing and repackaging, dissemination, transmission, and improving the quality of products and services of library and information centres.

We chose Koha which is an integrated library system with a growing user community. It is written in Perl and using MySQL as the underlying database. Koha makes it simple to create and manage a small to medium-sized integrated library system. It is equipped with acquisitions, cataloguing, circulation, and searching modules and it also provides much of the functionality of traditional online catalogues. With the recent implementation of its Z39.50

interface, it is easy to enter ISBN numbers into the system, locate MARC records, and have those records added. The user and system interfaces are simple and imaginative, but has challenges with customization. For many libraries, the catalogue is the centrepiece of the operation. Koha represents a major step in providing a catalogue that is functional and usable. As long as support continues, Koha is expected to be a more feasible option for big library collections. The obstacle is not technology but it is time and effort. (<http://www.koha.org/>)

According to Breeding (2008b), Koha ranks as the first full-featured open-source LMS and serves the most number of libraries, mainly public libraries in the US. In the UK, the first Koha implementation experience was in 2008 at the Royal London Homoeopathic Hospital (Bissels, 2008). In Taiwan, there are currently about 10 libraries using Koha, with the majority of them being primary schools in rural areas. The library school at Fu-Jen Catholic University has incorporated the Koha system into its courses on library automation systems as a tool for course practicals.

5.1 Recommendation

We could have implemented any other ILS or even developed from scratch but we realised that with use KOHA; we can upgrade it as soon as a new KOHA version releases. And, this is a major advantage of using KOHA. Koha developers are continually upgrading so Koha for CSUC can be upgraded at any time we want.

You can check the KOHA development tree here: <http://git.koha.org/>

KOHA is web based

We don't need to install KOHA on each and every machine to use it. KOHA is installed in a server and from there, it serves through Internet Protocol Address or its own website. So, each and every job will be done over only web browser. Now, we don't need to bother for third party softwares like Microsoft Visual Basic etc. We are therefore using a "complete library management system". So, we have increased our flexibility and definitely portability. In the near future a live chat service could be included in the koha system to enable patrons communicate with the administrator or the librarian.

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