**CHAPTER ONE**

**BACKGROUND OF STUDY 1.1 :**

A library is a place where a huge collection of books and resources are available which can be accessible by the users. It acts as a brain for the institutions. It enhances the dissemination of knowledge and spiritual civilization among the students. The tons of books and research works are captivating the students to improvise their knowledge in all perspectives. It guides the students to promote their views differently. This knowledge optimizes the student to achieve better results in academic as well as personal skill development. Improvisation in technology causes the demand for developing a way to enhance the traditional library set-up to a digital one. Numerous tedious processes reduce the efficiency of the library. For example, It always needs manual support to do any activities in the traditional library. The count and details of books are scribbled on the paper for reference. Each data is fetched in the notebook for future citations. To examine any data then they have to refer to the notebooks. At the same time while distributing the books to the students they have to enter into the notebook where they need to represent the book id, distribution and renewal date, and student id. The librarians/staff have to assign a tag for each book and provide an id for it. They have to align and arrange the books on the shelves and marked them. Missing or theft of the book builds a serious issue and confusion for the librarians. While collecting the book from the students they have to verify the penalties of the books. Therefore it causes a monotonous among the staff. Consequently, it builds an uninteresting among the student due to the slow progress of the staff. To evoke the library into the technological era, we presented a system called the Library Management System (LMS). It is an automatic system that reduces the work burden of the staff/librarians through a single click. It will manage, organize and orient the library task. The LMS supports the librarian to add/view/delete/update details from the library stock. Here we integrate all the library data into the Mongo DB server. Preliminarily the librarian has to add student and book details to the database. After that, he/she can view/delete/update those details through the Library Management system. On account of this, the user can access the library at any time. The librarians can assist with the data without any confusion. Each data are retrieved from the database. if he/she accesses any user details then it shows username, id, book details, and penalty details. They do not need to write it on paper for any references. By editing the data they can change the parameter in it. Despite working on the manual, the librarian can feel easy to handle the automatic system. It has more additional features such as the librarian can maintain library records and student’s history of penalties and issues. It always tracks the count of the book in the library and issues book details. This causes a flexible service for librarians and students. It is a user-friendly interface, so basic computer knowledge is enough to access the LMS. The system is a customizable and user-configurable one which causes it to use in different organizations. We represent the LMS with the Admin module. We built the LMS in .Net Technology which is considered one of the upcoming technology in IT industries. With the integration of all the modules, it will be presented on the desktop of your computer.

As aforementioned the data are stored and secured in the database. The related data

are stored together and maintained properly. It allows the user to create their database as per the requirement. The database gets manipulated by the programs which provide an interface between the databases. The database management system (DBMS) receives the command from the administrator based on the instruction it changes the data in the database. This instruction may load, retrieve or modify the existing database. It is better to assign a DBMS as a centralized one which helps multiple users to access the database in a controlled manner at a different location. Based on the scheme of DBMS, the system can assign a view mode for each user some people can see only some data and the authorized one can see all the data existing in the database. It offers both logical and physical data independence. The Open database connectivity (ODBC) provides an application programming interface that allows the client-side program to call the DBMS on the server side.

**PROBLEM OF STUDY 1.2**

Presently, transactions of books in the institutional libraries have been done manually in most cases, thereby taking more time for transactions like borrowing books or return of books and also searching for members and books. A series of problems occur as a result of this thereby resulting in inefficient library management. In most cases as a result of human error, there may be loss and damage of records due to not using a computerized system in the library. Nevertheless, the difficulty in searching for books which could be termed to be inadequacy in book Management is a problem in the manual library thereby causing inefficiency and time-consuming in the library. Also, the problem of space consumption erupts after the number of records become large the space for physical storage of file and records also increases if no computerized system is implemented as well as the issue of cost. Due to the problem of lack of prompt information retrieval and time wastage in using the library. In addition due to the cumbersome, in this project computer approach will be used to solve these problems. Each of the manual procedures will be analysed.

**AIM OF STUDY 1.3:**

This project aims to develop a system that can handle and manage the activities involved in a library efficiently and reliably.

The objectives are:

i. Designing a computerized library management system which would help evacuate the problem faced in the manual library.

ii. Implementing the system.

iii. Evaluating and testing the performance of the system.

**SCOPE OF STUDY 1.4:**

The project product to be produced is a Library Management System which will automate the major library operations. The first subsystem is the registration of the users to the system to keep track of authorized users to the system. The second subsystem is the registration of new books into the library management system to know when new books are brought into the library. The third subsystem is a borrower and return of books which is the major area needed by the user.

There are three end users for the Library Management System. The end users are the admin, users and members.

**LIMITATION OF STUDY 1.5:**

The major limitation was that the database was not able to contain a large amount of data due to the application using the free tier plan.

Another issue was getting the correct API to integrate into the application but we are using Google Books API.

**DEFINITION OF TERMS 1.6:**

**Bibliography:** A list of books and articles to be found at the back of many non-fiction books, or the end of articles in encyclopaedia on the same subject.

**Accession Register:** A book in which the following information about the book is listed when it is obtained: accession number, title, price and source of supply, date of withdrawal and reason for withdrawal.

**Book Card:** A card kept in the pocket of a book when the book is on the shelf.

**Blurb**: Blurb tells what the book is about. It is found either in the front, inside flap of the jacket, on one of the first few pages of the book or the back cover.

**Catalogue:** Contain cards with information about each book in the library.

**Contents:** A list in the front of most books (after the title page) which gives the chapter heading or story titles and their page numbers.

**Cataloguing:** The description of each book on cards as it comes into the library.

**OPAC:** An online public access catalogue is an online database of materials held by a library or group of libraries. Users search a library catalogue principally to locate books and other material available at a library.

**DELNET:** a developing library network, is an organisation promoting resource sharing among libraries through the development of a network of libraries

**CHAPTER TWO**

**LITERATURE REVIEW**

**INTRODUTION**

The library is regarded as the brain of any institute, of course, many institutes understand the importance of the library to the growth of the institute and their esteemed users which we categorically call the students. An integrated library system, also known as a library management system (Adamson et al., 2008) is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and users who have borrowed.

The Library Management System is a Library Management software for monitoring and controlling the transactions in a library (Ashutosh and Ashish., 2012). Library Management System supports the general requirement of the library such as the acquisition, cataloguing, circulation and other sections.

Before the advent of the computer in the modern age there are different methods of keeping records in the library. Records are kept in the library on shelves and each shelf are labelled in alphabetical or numerical order, in which the categories of books available are arranged in a different position on the shelves and as well are recorded on the library manuscript and when any book is to be referenced the manuscript is being referred to, to know the position of such required book by the person that requested for the book. After the invention of the computer, different researchers have carried out various approaches to an automated library management system which this project is as well all about.

The first library management system to be reviewed is the KOHA library management system. Since the original implementation in 1999, KOHA functionality has been adopted by thousands of libraries worldwide, each adding features and functions, deepening the capability of the system. With the 3.0 release in 2005 and the integration of the powerful Zebra indexing engine, KOHA became a viable, scalable solution for libraries of all kinds.

LibLime KOHA is built on this foundation. With its advanced feature set, LibLime KOHA is the most functionally advanced open-source Integrated Library System in the market today. The major setback of this Library Management System is that it is web-based and as a result, it is not security conscious because hackers could have the database hacked and access or modify the information of such users. (www.koha.org).

Another Library Management System is Capital’s library software with the following benefits Increases support available for staff and users in any modern library service, provides efficiency, and innovative system that saves library time and improves the user experience.

A library management system usually comprises a relational database, software to interact with that database, and two graphical user interfaces (one for users, 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. Cataloguing (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)

A library management system usually comprises a relational database, software to interact with that database, and two graphical user interfaces (one for users, one for staff). Most Library Management Systems separate software functions into discrete programs called modules, each of them integrated with a unified interface. Before computerization, library tasks were performed manually and independently from one another. Selectors ordered materials with ordering slips, cataloguers manually catalogued items and indexed them with the card cataloguing system (in which all bibliographic data was kept on a single index card), and users signed books out manually, indicating their name on cue cards which were then kept at the circulation desk. Early mechanization came in 1936 when the University of Texas began using a punch card system to manage library circulation. While the punch card system allowed for more efficient tracking of loans, library services were far from being integrated, and no other library task was affected by this change. The literature study in the previous system could give more reference in the system development process. All the advantages of the previous system can be implemented during the development of this proposed system.

This chapter entails the literature review related to Library Management System initiatives worldwide, at national, regional and international levels. Secondary data will be searched from print and online resources. Foreign works of literature will be mainly used and some of these have been highlighted to peruse and emulate.

The purpose of this literature review is to establish the potential topics and suggest ideas for other research, reporting published materials on existing conceptual frameworks, theories, techniques, processes, styles and instruments of other researchers related to the topic under investigation. It will help analyse the scope of the study and in determining the various variables to be included.

As for this research, the main purpose of the literature review will be to grasp comprehensive ideas on the extent of library management system initiatives and projects that had taken place worldwide and the factors and conditions that had influenced and contributed to their success.

The approach to literature review is the browse method where print and electronic sources were looked at, read and digested, looking for some relevancy, appropriateness and usefulness of the topic at hand.

Predetermined keywords to be used during this search are library, virtual library, e-library, hybrid library, library management initiatives, library management problems, library management research, library services, resource sharing, distributed information resources, online databases, library automation, library systems, mobile information access, information professionals, librarian, global access, repositories and interoperability, management systems, library integrated system, database system administration (DBSA).

As the research involves qualitative data as well, researches will be made at the initial stage of the research making enquiries to get as much primary data as possible from as many librarians as possible whenever there are opportunities to understand the subject better and helped in the formulation of the research questions.

The literature review will be about the development of library management systems which is organized into the following sections namely Introduction, Features of Library Management, Why we need library management system, A Review of Problems and Challenges of Library Professionals in Developing Countries, Library Management System Initiatives Worldwide (review of library management system).

**Development of Library Management System 2.2:**

A library management system is a system for library resource planning, used to access the documents held, orders, payments or lending all made by the clients. Sometimes, a phrase like library integrated system is employed, especially in the UK. Cynthia Lopta defines the integrated system as an automated system in which all the functional modules share the same bibliographic database.

Integration as a concept is most usually found in the billion economy. It became a landmark over 20 years ago, and it has grown into an almost synonym for integrated systems. Sometimes, integrated refers to a system in which the library functions are processed in a main bibliographic file.

By the mid to late 2000s, library management system vendors not only the number of services offered but also their prices leading to some dissatisfaction among many smaller libraries. At the same time, the open-source Integrated Library System was in its early stages of testing. Some libraries began to such open source integrated library systems as KOHA and Evergreen. Most reasons noted from these were to avoid vendor lock-in, license fees and participate in software development. The much-needed freedom from vendors also allowed libraries to prioritize needs according to urgency, as opposed to what their vendors can offer. Recently, libraries which have moved to open-source integrated library systems have found that vendors are now more likely to provide quality service to continue a partnership since they no longer have the power of owing the Integrated Library System software and tying down libraries to strict contracts. This has been the case with the SC LENDS consortium. Following the success of Evergreen for the Georgia PINES library consortium, the South Carolina States Library along with some local public libraries formed the SC LENDS consortium to share resources and to take advantage of the open-source nature of the Evergreen Integrated Library System to meet their specific needs.

By October 2011, just two years after SC LENDS began operations, thirteen public library systems across 15 counties had already joined the consortium in addition to the South Caroline State Library. Librarytechnology.org does an annual survey of over 1,500 libraries and noted in 2008, 2 % of those who surveyed used the Integrated Library System, in 2009 the number increased to 8% and in 2010(most recent year available) 12% of the libraries polled had adopted open source Library Management System. Library project system that offers many flexible and convenient features, allowing librarians and library users to maximize time and efficiency. The library system gives detailed information about students, staff and books, it will track the books available in the library and the books that have been issued to the library users (students). It shows popular books among the students. It will provide books lost in the library. It keeps records of the supplier and the bookbinders.

**Features of library management 2.3:**

i. Manage Book and Member Records with the help of Barcode.

ii. Acquisitions: With library Management software, Acquisitions function as generating Purchase orders, Cancel Purchase Orders, Reminder Purchase orders, Receive Purchase Order, Invoice and instantly available in Reports. Data can be searched by feeding the Purchase Order number, Invoice number, and Supplier name.

iii. Circulation: Library Management Software enables the complete management of

multiple Item issues and return of books using Manual or Barcode Scanner.

iv. Barcode: The use of Bar Codes for Library Management eases the everyday tasks of big Libraries, where the No. of transactions exceed several thousand in number. Moreover, the software can work even without Bar Codes seamlessly. The Bar- Code generation and printing process is a Built-In feature of this Software.

v. OPAC: Library management software admin/Member can easily search book

author, Title, Accession No, Publication, and Language also admin can filter data category-wise.

vi. Facility for User to suggest items: User suggestion and request for purchasing a new item is handled by the software itself reducing the administrator’s task.

vii. Alert through Email: Admin can send mail to members, vendors, or any other people from the software.

viii. Multiple Library Setup: Library management software can be set up at different locations.

ix. Export All Reports into Excel, Word: Admin can take all the details which are displayed in the reports into Excel and Word files.

x. Handles donated items, and free items and keeps track of donors: Some library items are free or some person donates the item. So Library management software keeps

track of those items.

xi. Provide Multi-User environment: Library management software gives the facility of a multi-user environment. Multiple users can log in at the same time in the Library management software.

xii. Maintain Any Media: one can define several things that one wants to keep track of as well as can maintain different kinds of media like Books, CDs, File Documents, Video Cassettes, and Audio cassettes. Also, one can maintain media with its specifications rather than common and define the specification you want for that media, for a book (pages, ISDN number, type, volume).

xiii. Powerful Search Engine

xiv. Custom Field Indices: Library Software provides sorted data on required fields by clicking on the column header that is if clicked on the publisher the data will be sorted

on the publisher.

xv. Lock System: Lock the subject or group of the member, so that media can't be issued which falls under this criteria. One can in this way restrict the issuing of the

media.

xvi. Circulation: Easy operation of circulation by entering the code of media, getting all the information related to the media and the number. (Name, group, media type).

xvii. Easy Navigation and Updating: Selecting an option from the given menu provides all the data related to that option in tabular format in a user-friendly manner.

xviii. Auto Filter & Auto Search: On each master form, Library Software will search on the field where your cursor is and what you type is taken as a search value.

xix. Customize: one can customize the system to feel easier for data entry also while adding records user can keep the form in 'add' mode. Define Holidays. And Set the criteria for issuing the book if the member is requested for media or not.

xx. Scrap-Type: Define their scrap type for scraping the media. Provides scrap runner utility to record the number of scrap media.

xxi. Reports

**Needs for library management system 2.4:**

i. Improved customer services through greater access to accurate information

ii. Increased productivity and job satisfaction among staff members as it eliminates duplication of effort

iii. More economical and safer means of storing and keeping information

iv. Easier access to information like management reports and stock etc. as well as

accurate and faster results from statistical analyses.

v. Reduces errors and eliminates the ennui of long and repetitive manual processing vi. Greater accountability and transparency in operations

vii. Improved efficiency and effectiveness in administration and management as it has unprecedented access to real-time information.

viii. More reliable security for sensitive and confidential information.

ix. Appropriateknowledge–based action and intervention can now take place in a

timelier manner.

**Library management system initiatives worldwide 2.5:**

Neelakadan, Duraisekar, Balasubramani, and Srinivasa, (2010) in their study developed a system using KOHA Open source software to develop an updated database of books and other resources of the School of Chemistry Library, Bharathidasan University to implement the automated system using KOHA library integrated Open source software to carry out the charging and discharging functions of the circulation section more effectively which provide various search options to know the availability of books in the library to generate the list of books due by a particular member and also the overdue charges. KOHA is said to be an integrated software system with all the required models for small to very large libraries (Neelakandan et al., 2010). The outcome of the system they developed has Chemistry library collections that are in a single database, it gives full control over the library collections and operations, faculty members search and research scholars can check the required books by OPAC modules, research scholars and faculty members can check the status of their borrowed books, they can get the complete details about the books for their further reading and research, data entry of the books can be done through the downloading of bibliographic details from the library of congress and other catalogues and the library system developed can share their data with various library and another department in the libraries.

Koy yeah keat, (2011)in his research developed a library management system which could be mainly used by members and staff of the library. The system allows members to search for books and reserve books through websites so that they can save time and cost to travel from one place to another to use the library as well as know what the book entails in the library. In the system developed, staff can also be able to add news and also view reports with several criteria as well as add, edit and delete news. The system developed was aimed at allowing users to reserve books online, conveniently user borrowing books, implement email technologies to the website, implement SMS technologies to the system, and design a friendly graphical interface which would suit the users. In the designing of the system, various modules were considered which are:

i. Authorization and authentication module

ii. Member/staff module

iii. Search module

iv. Books maintenance module

v. News maintenance module

vi. Email module

vii. Report modules

viii. Publisher maintenance module

ix. Employee maintenance module etc.

The software used in the research entails the use of Microsoft products like the Microsoft visual studio 2008 for the website development and ASP.NET with C# as the programming language used having the Microsoft SQL Server 2008 as the database. Mainly the software and hardware requirement used in his research were:

i. Operating system: windows 7 professional

ii. Database: MYSQL server 2008

iii. Development tools and programming language: Microsoft visual studio 2008 and VB.NET

iv. Processor: Intel core i2 duo CPU T7250 @ 2.00 GHz

1. Ram: 2 GB

The methodology used in the research was the waterfall model which entails system planning, requirement analysis, system design, programming, system testing and evaluation. Ashutosh Tripathi, and Ashish Srivastava, (2012) developed a system which is a library management software for monitoring and controlling the transactions in a library. In their study, they came up with a Library Management System which was developed in Java and mainly focuses on basic operations in a library like adding new members, new books, updating new information, searching books and members and the facility to borrow and return books.

The system these two developed was an automated Library Management System. Through the software, users can add members, add books, search for members, search books, update information, edit information, and borrow and return books in a quick time. The system they developed has the following advantages.

User-friendly interface, Fast access to the database, less error, More Storage Capacity, Search facility, Look and Feel Environment.

All the manual difficulties in managing the Library were rectified by implementing computerization. The software was designed can help users maintain and organize the library making the software very easy to use for both beginners and advanced users.

The system requirement for the research entails how the library management system that was designed can be used in Windows 98 Windows2000, Windows XP and Windows NT, supported for other platforms such as Applet Macintosh and UNIX. The system was made to run on Windows 98 or Windows NT4.0 operating system and met the following hardware requirements.

i. For Windows 95-based computers, a 486 / 66 MHz or higher processor with 8MB

ii. For Windows 98-based computers, a 500/88MHz or higher processor with 32 Mb of RAM

iii. For Windows NT-based computers, a 488 / 66 MHz or higher processor with 16 MB of RAM

iv. For Windows 200-based computers, a 700/850 MHz or higher processor with 512 MB of RAM

At the end of his research, the combination of all the web pages he designed resulted in a web application named Library Management System, which works as an online library. Several user-friendly coding was also adopted.

**Review of Problems and Challenges of Library Professionals in Developing Countries 2.6:**

New tools of information technology have changed the role & responsibilities of librarians. Several studies have been conducted to explore the problems faced by librarians. The given section reviews the studies conducted at the International level in general and particularly in developing countries to investigate the problems confronted by librarians.

Adomi and Anie, (2006) in their research on computer literacy skills of professionals in Nigerian University libraries concluded that most of the professionals do not poses a high level of computer skill and their use of computers and technology is still maturing. They recommended that library management and leaders should organize and offer in-house Reviews of Problems and Challenges of Library Professionals in

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Adomi and Anie, (2006) in their research on computer literacy skills of professionals in Nigerian University libraries concluded that most of the professionals do not poses high levels of computer skill and their use of computers and technology is still maturing. They recommended that library management and leaders should organize and offer in-house accreditation bodies, lack of proper library facilities, inadequate physical facilities, little attention to selection criteria, and lack of apprenticeship programs. The study suggested that the Government of India should play a leading role in promoting LIS education in India, by creating more job opportunities for LIS professionals and removing disparity in pay scales among LIS professionals.

In Iran Gavgani, Shokraneh and Shiramin, (2011) concluded that librarians do not have traditional skills and sufficient background knowledge to meet the changing needs of their customers. They need to be empowered by new skills and information before going to empower their patrons. So there must not be a gap between librarians’ professional/technological knowledge and their societies' informational need that is to be answered by librarians. The need for changing the syllabus of medical library and information science education in Iran was also felt.