

LIBRARY MANAGEMENT SYSTEM



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APPROVAL FOR SUBMISSION

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Dedicated To Our Dear Parents and Our Teachers

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ABSTRACT

The libraries are a place which maintains the books, their creators, the individual of the library to whom books are issued, library staff and all. The librarian can maintain the book inventory including adding new books, tracking book issues, returns and damages, generate overdue or delay notices for students who fail to return books, and produce comprehensive reports on all library activities. Upkeep of all this data physically could be an exceptionally complex task. It decreases the workload of administration as most of the manual work done is reduced. Various modules have been built to handle major functions of the library like Books, Search, and Borrow and return books fine collection, reservation, report generation, etc. The system provides a simple and intuitive interface for users to interact with. Barcode technology has been used to uniquely identify books for automated check in, check out, renewal, reservation, etc. The software keeps track of all the information about the books in the library, their cost, their finalized details and absolute number of books present in the library. The Library Management System achieves automation and computerization of all major activities of a library, which helps in efficient management, reduces manual work, streamlines interactions, structures workflows, and enhances user satisfaction. HTML, CSS and JavaScript is used to design the front end while PHP and MYSQL helps in the back end of this online library management system.

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List of Abbreviation

Word	Abbreviation
SQL	Structured Query Language
SRS	Software Requirement Specification
UI	User Interface
PHP	Hypertext Preprocessor
HTML	Hypertext Markup Language
CSS	Cascading Style Sheet
GB	Gigabytes
XML	Extensible Markup Language
SVG	Scalable Vector Graphics
PDF	Portable Document Format
RDBMS	Relational Database Management System
ERD	Entity Relationship Diagram
DFD	Data Flow Diagram

CHAPTER 1

INTRODUCTION

1.1 Introduction

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 a better result in the 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 digital one. To evoke the library into the technological era, we presented a system called the Online Library Management system. It is an automatic system that reduces the work burden of the staff/librarians through a single click. It will manage, organize and oriented the library task. This system supports the librarian to add/view/delete/update details from the library stock. Here we integrate all the library data into the SQL server. Preliminarily the librarian has to add student and book details into the database. After that he/she can view/delete/update those details through the Library Management system. The librarians can support the data without any confusion. Each data is retrieved from the database. If he/she accesses any user details then it shows username, id, book details and penalty details. They no need to write it on paper for any references. By editing the data, they can change the guideline in it. In spite of working on the manual, the librarian can feel easy to handle the automatic system. It has more additional features such as librarian can maintain library records, student's history of penalties and issues. It always tracks the count of the book in the library and issued 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 this system. So, this chapter gives us an outline about the point, aim, objective, background and operational environment of the system.

1.2 Historical Overview of Library System

Libraries originated with writing about 6000 years ago and that was when writing was being done using materials like bones, clay, wax, papyrus, metals, silk, leather, parchment, paper, and other available materials. Later, these materials were assembled together to form libraries. Among the earliest libraries were ANCIENT LIBRARIES OF CLAY, which emerged in Iraq and other

Mesopotamian region like Syria and Turkey. In these libraries, records were kept on clay tablets. Within that period were also ANCIENT LIBRARIES OF ANIMAL SKIN and ANCIENT LIBRARIES OF PAPYRUS of which Alexandria libraries in Egypt were the examples. These libraries invariably were connected with temples, for these institutions were the centers of the whole life of the whole communities. Moreover, it is widely believed that the private and institutional libraries are traceable to Egypt and Greece respectively, and the emergence of public libraries started in Rome. Libraries studies was given a boost by Julius Caesar during the first century of the Roman especially with his conferment of the Franchise privilege on all foreign teachers of liberal education residing in Rome. However, it was Augustus, who succeeded Caesar that gave a greater impact to scholarship development. He founded the first public libraries in Rome (69 – 70 AD). With the increase in establishment of universities all over the country, the government of Nigeria also sees the essence of providing library in every institution of learning. Now, Nigeria can boast of libraries in all the higher institutions of learning, almost all the academic establishments and even private and public establishments. There are also National and state libraries throughout the states of federation. But all these libraries have one problem in common; the backwardness in the automated library world.

1.3 Project Points and Objectives

The venture points and targets that will be accomplished after completion of this extend are talked about in this subchapter.

The points and targets are as follows:

- Online book arrangements.
- A search column to look accessibility of books.
- An Admin login page where admin can include books, recordings or page sources

The books are now arranged by a librarian manually and it take too much time to arrange and to find a specific book for a student manually so through this system it become easier.

1.4 Background of Project

Library Management System is a web-based application that was developed and designed with the objective of automating library services. The system was intended to address the current problems experienced. This system aims in automating the processes of cataloging, book transaction, fine calculation, member details maintenance, and reports generation. The system's performance meets user's requirements, hence providing the main benefit of concentrating all the library services and functions within the power of a mouse click and feeding of data into the system. In this system,

Books and student modules are included in this which would keep track of the students using the library and also a detailed description of the books a library contains. In this computerized system, there will be no loss of book record or member record. The various modules will help the librarian to manage the library with more convenience and in a more efficient way as compared to library systems that are not computerized. The library is regarded as an integral part of any institute; a significant number of the foundations comprehend the importance of the library for the development of the establishment and their clients. Library Management System supports the general requirement of the library like acquisition, cataloging, circulation. This system offers numerous adaptable and helpful highlights, permitting bookkeepers and library clients to improve efficiency. The Library System gives all detailed information about students, staff, and the transaction of books and fine calculations. It will track how many books are available in the library. It generates reports for management. This system improves services delivered to end-users. Information can be searched from the system and the results displayed promptly. This system has friendly user interface that is attractive and easy to use. Information concerning all the library activities stored most securely.

1.5 Problem Statement

The problems found in the Library during Library operation was so much that there were cases where books got missing. If it is not stolen by the student, it may be stolen by the staff. Part of some books were change, manual issuing of books and cards, Identification of Books in its shelf, time required to record as well as presenting an Information and also the cost of purchasing books, newspaper and journals and magazines, uneasy returning of books to the library. Lack of effectiveness in their methods of record keeping, further compounds the problem.

1.6 Significance of the Project

The significance of this study was to help and give a benefit to the concerned librarian. The computerized library system would improve the monitoring capacities of those who maintain the library. It would be easier to determine whether a particular book is on-shelf or not. In addition, they can easily identify when will the borrowed material be returned and if a borrower has failed to return the book on its due date. Furthermore, the librarian would be much guided when it comes to recognizing new inventory books, letting them arrange it promptly and accordingly.

1.7 Limitation of the Project

1. Unavailability of academic materials.
2. Transport problem
3. Lack of financial support

4. Lack of Time

5. Unavailability of programming software such as Visual Basic 6, and .Net.

1.8 Scope of the Project

This research work will concentrate on master entry (i.e., department, course, student registration, etc....), Users (registration and login details), serial control, transaction, records, tools and about menu which includes handling of some queries like; updating library record, deleting library record and searching for student and staff information.

1.9 Definition of the Term

Following are the term which is related to this project “online library management system”.

1.9.1 Library

It is a department in an organization that deals with keeping tracks of book issued, returned and added to library.

1.9.2 Management

It is the co-ordination of all the resources of an organization through the process of planning, organization, directing and controlling

1.9.3 System

Physical component of a computer that is used to perform certain task.

1.9.4 Data

Numbers, text or image which is in the form suitable for storage in or processing by a computer, or an incomplete Information.

1.9.5 Information

A meaning full material derived from computer data by organizing it and interpreting it in a specified way.

1.9.6 Input

Data entered into a computer for storage or processing

1.9.7 Output

Information produced from a computer after processing.

1.9.8 Information System

A set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making and control in an organization

1.9.9 Library Management System

A library management system, also known as an automated library system is software that has been developed to handle basic housekeeping functions of a library.

1.10 Computer

Computer is an electronic device that accepts data as Input, processes data and gives out information as output to the user

1.11 Software

Software is set of related programs that are designed by the manufacturer to control the hardware and to enable the computer perform a given task.

1.12 Hardware

Hardware is a physical part of a computer that can be touched, seen, feel which are been control by the software to perform a given task.

1.13 Database

Database is the collection of related data in an organized form.

1.14 Programming

Programming is a set of coded instruction which the computers understand and obey.

1.15 Technology

Technology is the branch of knowledge that deals with the creation and use technical and their interrelation with life, society and the environment, drawing upon such as industrial art, engineering, applied science and pure science.

1.16 Algorithm

A set of logic rules determined during the design phase of a data matching application. The ‘blueprint’ used to turn logic rules into computer instructions that detail what step to perform in what order.

1.10 Operation Environment

The tools and technology that suitable for this system

Table 1.1 Tools for this system

PROCESSOR	INTEL CORE PROCESSOR OR BETTER PERFORMANCE
OPERATING SYSTEM	WINDOWS VISTA, WINDOWS7, UBUNTU
MEMORY	1GB RAM OR MORE
HARD DISK SPACE	MINIMUM 3 GB FOR DATABASE USAGE FOR FUTURE
DATABASE	MY SQL

CHAPTER 2

SYSTEM OVERVIEW

2.1 Introduction

Libraries play a vital role in providing access to knowledge and information. However, managing library operations manually can be time-consuming, error-prone, and inefficient. A Library Management System (LMS) offers a comprehensive solution to overcome these challenges. The LMS is a software application specifically designed for libraries, enabling librarians and staff to automate various tasks and processes. It integrates essential functions, such as book cataloging, member management, circulation, and reporting, into a single, user-friendly interface.

In a traditional library setting, cataloging books involves manually recording book details, such as title, author, publication information, and subject classification. With an LMS, this process is automated, allowing librarians to quickly enter book information, generate unique identifiers, and maintain a centralized database of books. This automation reduces human error, enhances consistency, and enables efficient searching and retrieval of books.

In the manual system, member registration, issuing library cards, and maintaining borrower records are often time-consuming and prone to errors. An LMS simplifies member management by providing digital registration forms, automating card issuance, and maintaining up-to-date member profiles. This streamlines the borrowing process and facilitates efficient communication with library patrons.

In the manual system, librarians manually record book transactions, update due dates, and calculate fines. However, an LMS automates these processes, enabling self-checkout systems, automatic due date calculations, and fine management. This automation reduces human error, speeds up transaction processing, and improves overall circulation efficiency.

2.2 Existing System

Early days Libraries are managed physically. It required part of time to record or to recover the details. The representatives who got to record the details must perform their work exceptionally carefully. Indeed, a little mistake would make a lot of issues. Security of data is very less. Report generations of all the data is exceptionally tough task. Maintenance of Library catalogue and arrangement of the books to the catalogue is very complex assignment. In addition to its upkeep of

member details, issue dates and return dates etc. physically may be a complex task.

The existing library management system faces several problems that can be addressed by implementing an automated Library Management System (LMS). Here are some of the common issues in the existing system:

- **Manual Data Entry:** The manual cataloging of books and member information is time-consuming and prone to errors. Inaccurate or inconsistent data entry can lead to difficulties in searching, retrieving, and managing library resources.
- **Time-Consuming Processes:** The manual processes involved in book check-in, check-out, and reservation management are labor-intensive and time-consuming. Librarians need to handle physical records, update information manually, and communicate with members individually, resulting in inefficiencies and delays.
- **Lack of Real-Time Information:** In the existing system, obtaining real-time information about book availability, member status, and overall library operations is challenging. Manual record-keeping makes it difficult to access up-to-date data and generate timely reports, hindering decision-making and efficient resource allocation.
- **Limited Accessibility:** Without an online interface, library patrons face limitations in accessing library resources and services remotely. They cannot search for books, place holds, or renew loans online, reducing convenience and user satisfaction.
- **Inefficient Searching and Retrieval:** The absence of a centralized database and efficient search capabilities makes it difficult for librarians to locate specific books or member information quickly. This leads to increased time spent on searching and decreased overall productivity.
- **Inaccurate Inventory Management:** Manual inventory management often results in discrepancies between physical book counts and recorded quantities. Without an accurate inventory system, libraries may struggle with stock control, reordering, and identifying missing or lost items.

2.3 Problem with Existing System

There are several problems with existing Library Management Systems (LMS) that can impact the efficiency and effectiveness of library operations. Some of these problems include:

- **Outdated technology:** Many libraries still use legacy LMS systems that are outdated and not designed to handle modern requirements and workflows. These systems may be slow, prone to errors, and difficult to maintain.

- **Lack of integration:** Some LMS systems may not integrate well with other library technologies, such as RFID tagging or interlibrary loan systems, making it difficult to manage and track library resources.
- **Limited functionality:** Some LMS systems may not offer all the features and functionality required by modern libraries, such as online public access catalogs (OPACs), self-checkout kiosks, or mobile access.
- **Poor user experience:** Some LMS systems may not be user-friendly, with complicated interfaces and processes that can frustrate library staff and patrons.
- **Data security concerns:** Many existing LMS systems may not be designed with strong data security protocols, leaving library data vulnerable to cyber threats and breaches.

Overall, these problems can lead to inefficiencies, errors, and frustration for library staff and patrons. Upgrading to a modern LMS system can help address these issues and improve library operations and user experience.

2.4 Previous Work Done

- **Open Library System (OLS):** OLS is an open-source LMS developed by the British Columbia Libraries Cooperative. It provides a range of features, including cataloging, circulation, acquisitions, and online access to library resources.
- **Integrated Library System (ILS):** ILS is a type of LMS that integrates all aspects of library management, including cataloging, acquisitions, circulation, and serials management. It allows for a streamlined and integrated approach to library operations.
- **Digital Asset Management (DAM):** DAM systems are used to manage and organize digital assets, including images, videos, and audio files. These systems can be integrated with LMS systems to provide access to digital resources.
- **Linked Data:** Linked Data is a method of organizing and linking data to provide more meaningful and useful information. It has been applied to LMS systems to improve cataloging and search functionality.
- **Cloud-based LMS:** Cloud-based LMS systems offer the advantages of scalability, flexibility, and remote access. These systems are increasingly popular among libraries of all sizes.
- **Mobile LMS:** Mobile LMS systems provide access to library resources via mobile devices, including smartphones and tablets. This allows patrons to access library resources from anywhere, at any time.

These are helped to improve the functionality, usability, and security of LMS systems and enhance the user experience for library patrons.

2.5 Proposed System

To solve the bothers as specified within the existing system, an online Library is proposed.

The proposed framework contains the following features:

- The proposed Library Management System (LMS) with OCR (Optical Character Recognition) integrates OCR technology to enhance the functionality and efficiency of the system. OCR enables the system to convert printed or handwritten text from physical documents into machine-readable text.
- The LMS provides a user-friendly interface for librarians to manage member information. It allows librarians to register new members, update member details, and handle membership renewals.
- The LMS enables efficient management of the library's collection. Librarians can easily add new books, update existing book records, and categorize books based on genres, authors, or keywords.
- The system facilitates communication between the library and its members. It sends automated notifications for due dates, reservations, and other relevant updates via email or SMS.
- The proposed system prioritizes the security and privacy of library data. It incorporates appropriate access controls, authentication mechanisms, and data encryption to protect sensitive information.
- The system will have an intuitive and user-friendly interface, making it easy for librarians and patrons to navigate and perform various tasks.

2.6 Significance of Proposed System

The proposed Library Management System (LMS) holds significant importance in enhancing the efficiency and effectiveness of library operations. Here are some key significance of the proposed system:

- **Automation and Streamlining:** The proposed LMS automates various manual processes, such as cataloging, member management, check-in/check-out, reservations, and reporting. By eliminating manual tasks and streamlining workflows, the system reduces human error, saves time, and improves overall operational efficiency.
- **Search and Retrieval:** With efficient search capabilities and a centralized database, the LMS enables quick and accurate searching and retrieval of books and member information. Librarians can easily locate specific items, reducing search time and improving overall productivity.
- **Cost and Time Savings:** The automation of manual processes and streamlined workflows lead to significant cost and time savings for libraries. Librarians can focus on more value-added tasks, while users benefit from faster and more efficient services.

- **Long-Term Preservation:** The system facilitates the digitization of physical documents, ensuring their long-term preservation. It enables the library to create digital archives, protecting valuable historical materials and making them easily accessible to researchers and scholars.
- **Improved Security and Privacy:** The proposed system implements robust security measures, such as user authentication, data encryption, and access controls, to ensure the privacy and security of user information. This builds user trust and safeguards sensitive data.

2.7 Software Tools Used

This Project is divided in two parts the front end and the back end.

2.7.1 Front End

The front end is designed using of html, CSS, JavaScript

2.7.2 Html

HTML or Hyper Text Markup Language the main markup language for making web pages and other data that can be shown in a web browser. HTML is composed within the frame of HTML components consisting of tags enclosed in point brackets (like <html>), inside the web page content. HTML tags most commonly come in sets like <h1> and </h1>, although some tags represent empty elements so are unpaired, for example .

The first tag in a match is the begin tag, and the second tag is the end tag (they are too called opening tags and closing tags). In between these tags web designer can add text, further tags, comments and other sorts of text-based content. The reason of a web browser is to read HTML archives and compose them into visible or capable of being heard web pages. The browser does not show the HTML tags, but uses the tags to interpret the content of the page. HTML components frame the building block of all websites.

2.7.3 CSS

Cascading Style Sheets (CSS) is a style sheet language utilized for describing the look and formatting of a document composed in a markup language. While most frequently utilized to style web pages and interfacing composed in HTML and XHTML, the language can be connected to any kind of XML document, including plain XML, SVG and XUL. CSS is a cornerstone specification of the web and nearly all web pages utilize CSS style sheets to portray their presentation. CSS is outlined primarily to enable the partition of document content from record presentation, including elements such as the layout, colors, and textual styles. This division can improve content accessibility, give more adaptability and control within the specification of presentation characteristics, enable multiple pages to share formatting, and diminish complexity and redundancy within the structural content

(such as by allowing for table less web design).

2.7.4 JavaScript

JavaScript (JS) is a dynamic computer programming language. It is most commonly utilized as portion of web browsers, whose implementations allow client- side scripts to interact with the user, control the browser, communicate asynchronously, and change the document content that is displayed. It is additionally being utilized in server-side programming, game development and the creation of desktop and mobile applications. JavaScript is a prototype-based scripting language with dynamic typing and has first-class functions. Its syntax was influenced by C. JavaScript duplicates numerous names and naming conventions from Java, but the two languages are otherwise irrelevant and have exceptionally different semantics.

2.7.5 Back End

Back End consists of two parts PHP and MYSQL.

2.7.6 PHP

PHP is a server-side scripting language outlined for web development but too utilized as a general-purpose programming language. PHP is now installed on more than 244 million websites and 2.1 million web servers. Originally created by Rasmus Lerdorf in 1995, the reference usage of PHP is now delivered by The PHP Group. While PHP originally stood for Personal Home Page, it now stands for PHP: Hypertext processor, a recursive acronym. PHP code is interpreted by a webserver with a PHP processor module, which generates the resulting web page: PHP commands can be embedded specifically into an HTML source document instead of calling an external file to process data

2.7.7 MYSQL

MySQL ("My S-Q-L", officially, but also called "My Sequel") is (as of July 2013) the world's second most widely utilized open-source relational database management system (RDBMS). It is named after co-founder Michael Wideners daughter, My. The SQL phrase stands for Structured Query Language. The MySQL development project has made its source code accessible under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, presently claimed by oracle Corporation. My SQL may be a well-known choice of database for use in web applications

2.8 Summary

In this chapter we discuss the system provides a user-friendly interface that allows librarians and patrons to interact with the system easily. By automating manual tasks like data entry and document processing, the system improves operational efficiency and reduces the potential for human errors. It also integrates OCR technology, which enables the extraction of text from physical documents, thereby speeding up data entry and enhancing accuracy. The proposed Library Management System not only focuses on improving internal library operations but also emphasizes user satisfaction and inclusivity. The proposed system emphasizes data security and privacy, implementing measures like user authentication, data encryption, and access controls. It also generates reports and analytics to aid librarians in data-driven decision making, collection development, and resource allocation.

CHAPTER 3

SYSTEM METHODOLOGY

3.1 Introduction

This chapter consists of system methodology in the development of a Library Management System provides a structured approach to designing, implementing, and maintaining the system. It ensures that the system meets the specific requirements of the library and aligns with industry best practices.

3.2 Requirement Collection Method

In requirement collection is a crucial step in the development process of any software system, including a Library Management System (LMS). The requirement collection is to gather information about the needs, including library staff, administrators, and users, to use this information to develop a system that meets their needs and is as effective as possible. A well-defined requirement collection process will ensure that the system meets the needs of its users and stakeholders. In this article, we'll introduce a few popular requirement collection methods that can be employed for designing a library management system.

- **Interviews:** Conducting interviews with librarians, library staff, and users is an effective way to gather detailed information about their needs and expectations from the system. This method helps in understanding the day-to-day tasks, challenges faced, and desired improvements.
- **Observation and Task Analysis:** The second way Observing library staff and users in their natural environment can provide valuable insights into their workflows, tasks, and interactions with existing systems. Task analysis involves the careful examination of tasks performed by users, which helps in identifying the key features and functionalities required in the LMS.
- **User feedback:** The third and the last way user feedback involves reviewing comments, suggestions, and complaints submitted by stakeholders through various channels such as email, phone, or online feedback forms.

3.3 Software Process Model

A software process model, also known as a software development life cycle (SDLC) model, is a framework that defines the activities, tasks, and phases involved in the development of a software product. There are various software process models, each with its own approach to organizing and structuring the development process. In this system we selected the water fall model. It is a sequential

design process used in software development processes in which progress is seen as flowing steadily downwards (like a water) through the phases of conception, initiation, analysis, design, construction, testing, implementation and maintenance.

3.3.1 Waterfall Model

Waterfall Model is a basic model we use for development of any software. It divides the development life cycle into different phases. The output of one phase will be input for the next phase. In the Waterfall model, each phase is completed before moving on to the next, and there is minimal overlap or iteration between phases. This model is best suited for projects with well-defined and stable requirements, where changes are expected to be minimal. However, it can be less adaptable to changing requirements and may result in longer development cycles. Waterfall model is simplicity of understanding. It allows for better project planning and estimation as the requirements and scope are defined upfront.

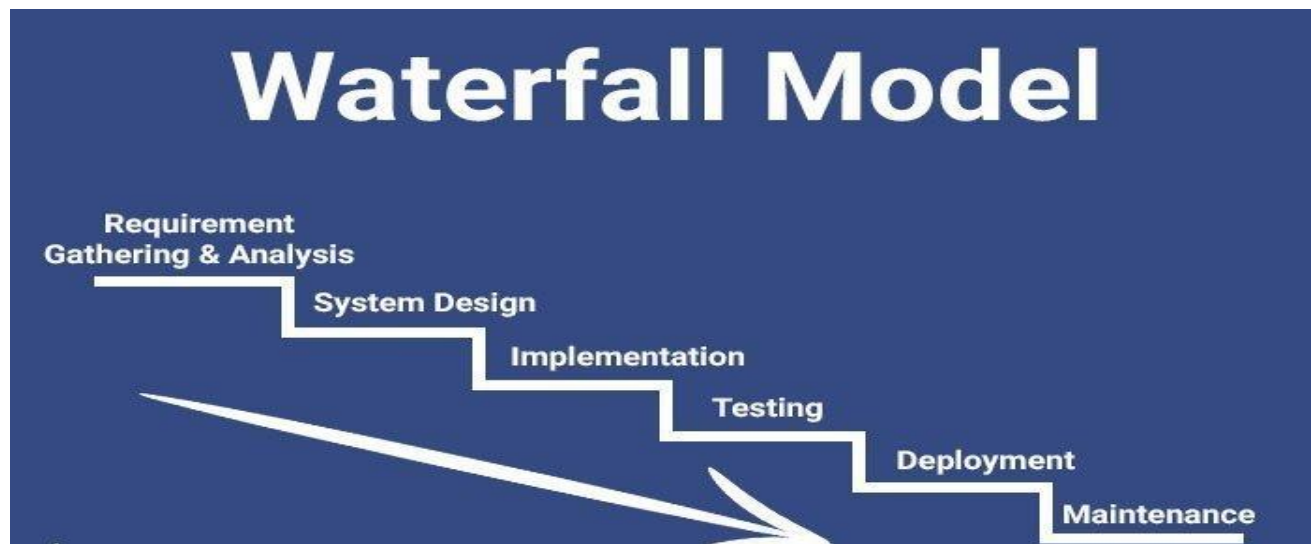


Figure 3.1: Waterfall Process Model

In this system first of all we collect all possible requirements to be developed and captured in this phase and documented in a requirement specification document. All the requirements are gathered very carefully because in waterfall model the requirements must be clear no ambiguous requirements exist. It is a top-down activity and requirement is the first/top step if we make any mistake in the first step then the whole process is disturbed. And last the product can never meet our requirements because of making the wrong decision in the first. The waterfall model is used only in situations where requirements are well defined and there are no ambiguous requirements. That's why we selected this model in this process.

3.3.2 Reason for using Waterfall Model

As in Library management system, The requirements are very clear in the initial stage, that's why we chose water fall model for the development.

3.3.3 Phases of Waterfall Model

The water fall model consists of the following phases which is mentioned in detail.

3.3.4 Requirement Gathering and Analysis

This is the first of the waterfall model phases, where the client has to provide the requirements for the software system. Usually, one or more technical people will have meetings with the client to define the requirements and understand what they want the system to do. This may be a lengthy process, where the project team is most likely to spend a lot of time, especially when the system is big and covers various business areas. It is important that the requirements are correct, as it forms the basis for everything that will be done in all the following phases of the project. When using the waterfall model, it is not possible to come back to the requirements and change them at a later stage, therefore this step is very important.

3.3.5 System Design

Some sources call it the design phase, while others call it analysis and design. The software requirements that were obtained from the clients are analyzed to see how they can be turned into a computer system and then the design is done. Some of the things that are considered in this phase are the inputs and outputs of data, how the rules can be implemented, which computer languages to use, and what hardware will be the best. The design documents are used as the blueprint for the coding in the next phase. We developed the DFD Diagrams, the use case diagram, class diagram, etc. for system design which represents the whole architecture of the system.

3.3.6 Implementation

In this step we implement all those activities which are developed in the system design and convert that into the piece of code. The system is first developed in the small programs called units or modules. Each unit is developed and tested for its functionality. We develop the separate module for employee, customer, and category. It means that management system of the library is divided into small units called modules.

This is done through programming, testing, and integration of different components to create a functional system. The implementation phase is an important stage where the project team must ensure that the software product is developed according to the client's requirements and meets the design

specifications created in the previous phase.

3.3.7 Integration and Testing

Integration and testing are two crucial phases in the waterfall model. In the integration phase, the individual components of the software are combined and tested as a group to ensure that they work together seamlessly. This phase involves identifying interfaces between components, resolving any compatibility issues, and integrating the components into a cohesive system.

After the integration phase, the testing phase begins. The testing phase involves verifying that the software meets the specified requirements and identifying any defects or bugs. Testing is done at each stage of the development process, from unit testing of individual components to system testing of the entire software system.

3.3.8 Deployment

Once the functional and nonfunctional testing is done the product is deployed in the customer environment. The completed software product is deployed into the production environment, making it available for use by end-users. It involves the installation, configuration, and testing of the software in the target environment, which may be different from the development environment. During deployment, it is essential to ensure that the software is installed and configured correctly in the customer environment. Any issues or errors should be addressed promptly to prevent disruption to the system. It is also important to provide support to the end-users during the initial use of the system to ensure a smooth transition. Deployment in the waterfall model is a critical phase since it marks the final stage of the development process. Once the software is deployed, it can be used by end-users to fulfill their requirements.

3.3.9 Maintenance

In this phase we are trying to maintain the functionality of the system if some problem exists in the client environment, we are trying to solve those issues such activities are come in maintained phase. The main point of this process model is the outcome of the one phase is the input of the next phase. The next phase can never be started if the previous phase is not completed. When the previous phase is completed, the next phase will start. In the maintenance phase, the system is deployed and delivered to the client, and any issues or bugs identified in the system during its usage are addressed. This phase also involves making any necessary updates or modifications to the system to meet changing requirements or to improve its functionality.

3.4 Summary

In this chapter we discussed methodology: different methods of collecting requirements like analyzing old system, direct observation, and communicating with employees. Then we discussed the feasibility of requirements by all aspects like economic, operational and technical feasibility. By feasibility study method we will ensure that the project can be done within budget, all the user requirements can be performed as well with a secure, flexible and maintainable software application.

CHAPTER 4

SYSTEM ANALYSIS

4.1 Introduction

In this chapter, we'll examine and analyze almost the creating handle of Library Administration Framework counting software requirement specification (SRS) and comparison between existing and proposed framework. The functional and non-functional requirements are included in SRS portion to supply total portrayal and diagram of framework prerequisite some time recently the creating handle is carried out. Other than that, existing vs. proposed gives a set of how the proposed framework will be more productive than the existing one.

4.2 Software Requirement Specification

In this online system a librarian should be able to search books by their title, author, category as well by the publisher. Each book will have a unique identification number and a student which includes to the system will also have a unique id number.

4.2.1 General Description

Online library management system is a web application that is designed to manage all the functions of a library. It helps librarian to maintain the database of new books and the books that are borrowed by members along with their due dates. This system completely automates all your library's activities.

4.2.2 Product Description

Library Administration Framework may be a computerized framework which makes a difference user (librarian) to oversee the library day by day movement in electronic arrange. It diminishes the chance of paper work such as record misplaced, record harmed and time consuming. It can offer assistance client to oversee the exchange or record more successfully and time- saving

4.3 Problem Statement:

The issue happened some time recently having computerized framework includes

4.3.1 File lost

When computerized framework isn't executed record is continuously misplaced since of human environment. Sometimes due to a few human blunders there may be a misfortune of records.

4.3.2 File damage

When a computerized framework isn't there, record is continuously misplaced due to a few accidents like spilling of water by a few parts on record incidentally. Other than a few characteristic disasters like floods or fires may harm the files.

4.3.3 Difficult to search record

When there's no computerized framework there's continuously a trouble in looking of records in the event that the records are huge in number.

4.4 System Objectives

The main objective of the Library Management System is to manage the details of Address, Member, Issues, Books, Student. It manages all the information about Address, Librarian, and Student.

4.4.1 Improvement in control and performance

The framework is created to manage up with the current issues and issues of library the system can add user, validate user and is also bug free.

4.4.2 Save time

Librarian is able to look record by utilizing few clicks of mouse and few search keywords thus saving his important time.

4.5 System Requirements

The system requirement in online library management focuses on the possibility of search for books by title, author or subject by the member. The system should provide details on the books held by the members.

4.5.1 Non-Functional Requirements

Usability is the main non-functional requirement for an online library management system. The UI should be simple enough for everyone to understand and get the relevant information without any special training.

4.5.2 Product Requirements

This product will work as a complete user interface for library management process and can be used by any new or existing library to manage its books and book borrowing, insertion and monitoring.

4.5.3 Efficiency Requirement

When a library administration framework will be executed librarian and client will effortlessly access library as searching and book exchange will be very faster.

4.5.4 Reliability Requirement

The framework should precisely perform member registration, member validation, report generation, book exchange and search.

4.5.5 Implementation Requirements

In implementing whole framework, it uses html in front end with PHP as server-side scripting language which can be utilized for database connectivity and the backend i.e., the database portion is created utilizing MYSQL.

4.5.6 Register New Book

This feature allows to add new books to the library Functional requirements System must be able to confirm information System must be able to enter number of duplicates into table. System must be able to not allow two books having same book id.

4.6 Software and Hardware Requirements

This section describes the software and hardware requirements of the system.

4.6.1 Software Requirements

Operating system- Windows 7 is utilized as the operating system because it is stable and supports more highlights and is more user friendly

Database MYSQL-MYSQL is used as database because it easy to maintain and recover records by basic inquiries which are in English language which are simple to get it and easy to write.

Development tools and Programming language- HTML is utilized to write the complete code and create webpages with CSS, java script for styling work and php for sever side scripting.

4.6.2 Hardware Requirements

Intel core i5 2 generation is utilized as a processor because it is quicker than other processors a give reliable and stable and we will run our pc for longtime. By utilizing this processor, we will keep on creating our project without any worries.

Ram 1 GB is utilized because it will give quick reading and composing capabilities and will in turn back in processing.

CHAPTER 5

SYSTEM DESIGN

5.1 Introduction

System Design is the process of designing the architecture, components, and interfaces for a system so that it meets the end-user requirements in this article, we will take a look at the key features a library management system needs to offer, its ERD, DFD, sequence, activity and use case diagram and some of the already existing library management system software.

5.2 Online Library Management System ERD

ERD is known as Entity-Relationship Diagram, it is used to analyze to the structure of the Database. It shows relationships between entities and their attributes. An ER Model provides a means of communication.

The Library Management System database keeps track of readers with the following considerations. The system keeps track of the staff with a single point authentication system comprising login Id and password.

Staff maintains the book catalog with its ISBN, Book title, price (in INR), category (novel, general, and story), edition, author Number and details.

A publisher has publisher Id, Year when the book was published, and name of the book.

Readers are registered with their user_id, email, name (first name, last name), Phone no (multiple entries allowed), communication address. The staff keeps track of readers.

Readers can return/reserve books that stamps with issue date and return date. If not returned within the prescribed time period, it may have a due date too.

Staff also generate reports that has readers id, registration no of report, book no and return/issue info.

The given online Library ER diagram illustrates key information about the library, including entities such as staff, readers, books, publishers, reports, and authentication system. It allows for understanding the relationships between entities

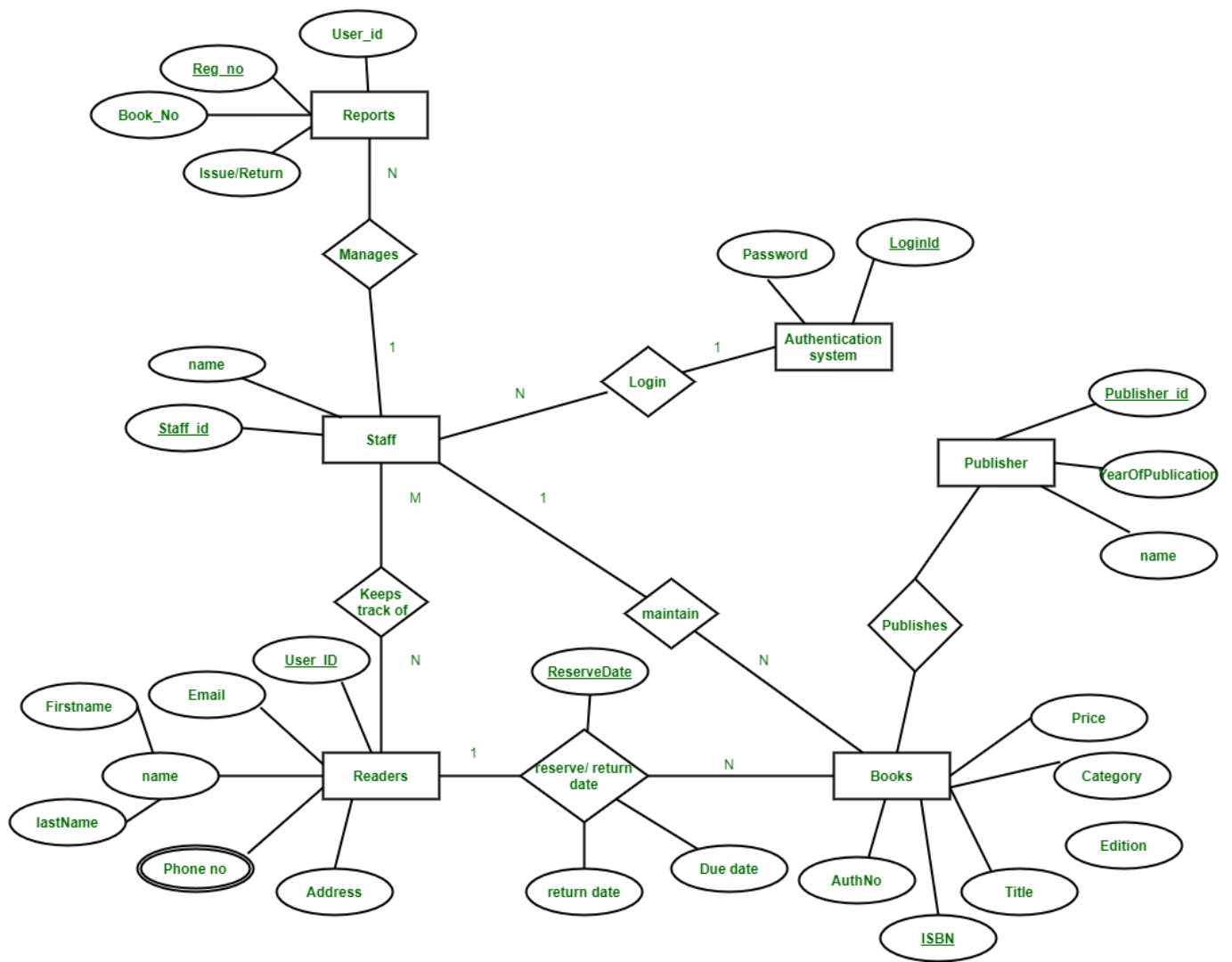


Figure 5.1 ER Diagram of Library Management System

5.2.1 Entities and their Attributes

Book entity: It has author, ISBN number, title, edition, category, and price. ISBN is the Primary Key for Book Entity.

Reader entity: It has user id, Email, address, phone no, name. Name is composite attribute of first name and last name. Phone no is multi valued attribute. User id is the Primary Key for Readers entity.

Publisher entity: It has publisher id, Year of publication, name. Publisher id is the Primary Key.

Authentication system entity: It has login id and password with login id as Primary Key.

5.3 Activity Diagram

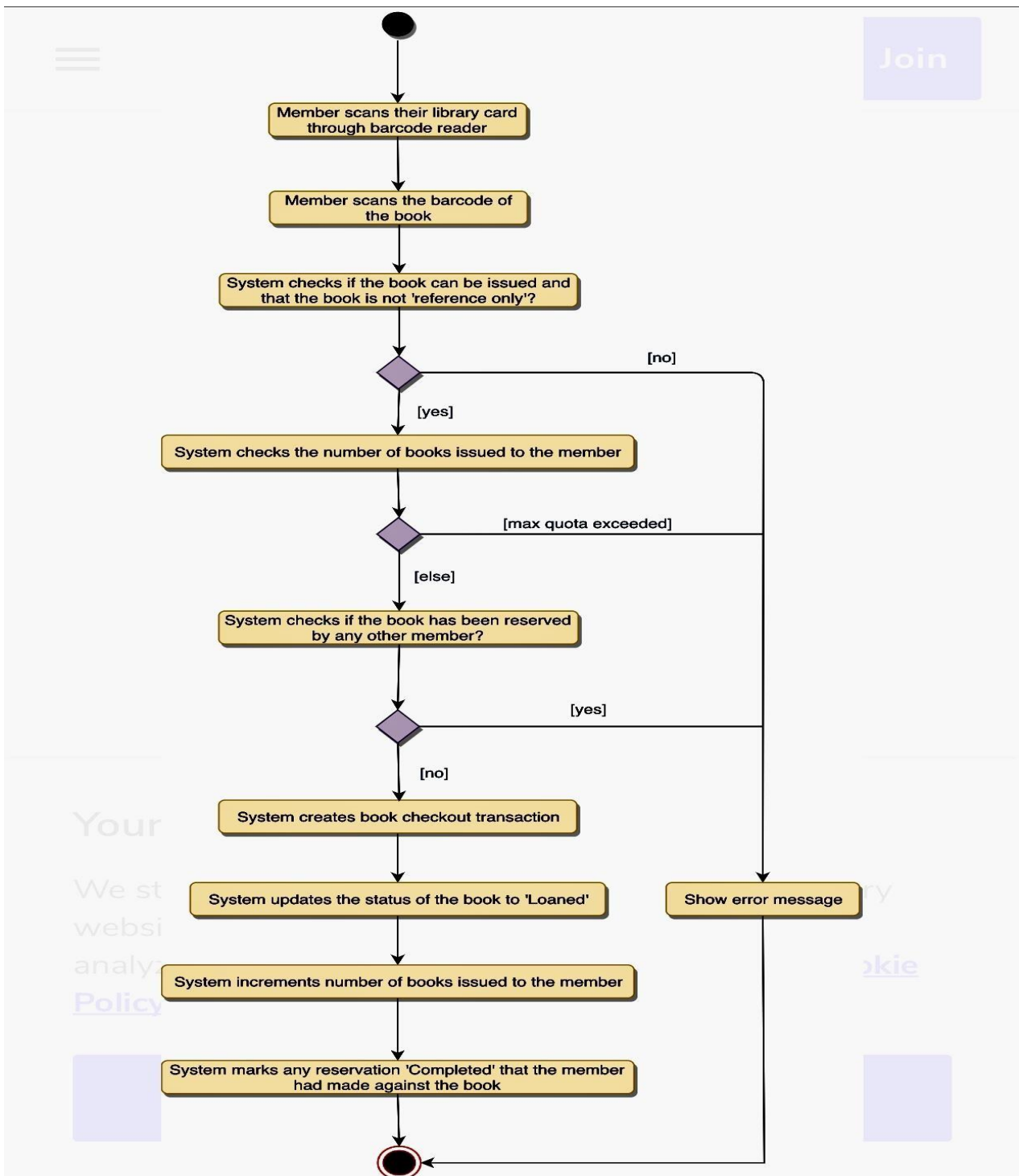


Figure 5.2 Activity diagram

5.4 Data Flow Diagrams

The flow of information and the transformation applied when a data moves in and out from this online library management system. The overall system is represented and described using input, processing and output of the data flow diagram which are as under

Administrator can enter to the system where he/she can use his admin id and admin password to enter to the library management system. Administrator can add or remove the existing user and also accept or regret the book request and can check all the database.

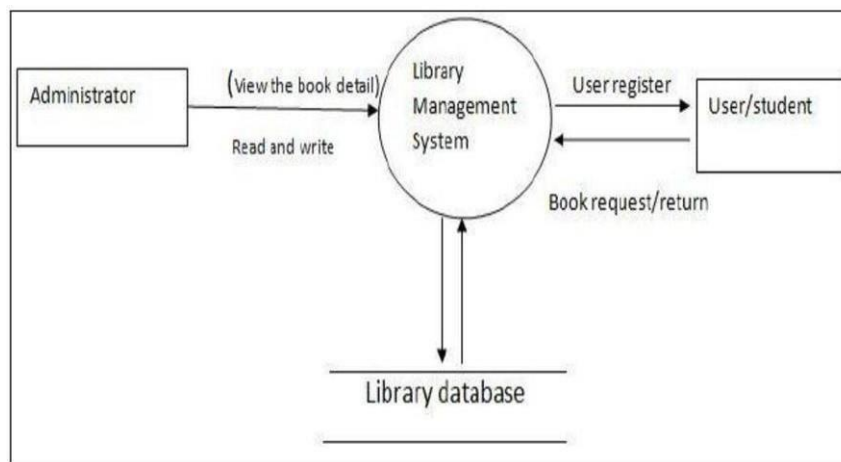


Figure: 5.3 Dataflow diagram of admin login

5.5 Use Case diagram for admin

The above is the use case diagram for library management system through which it informs the entity relationship between student, administrator and the system. The admin can check all the operation on which the system works.

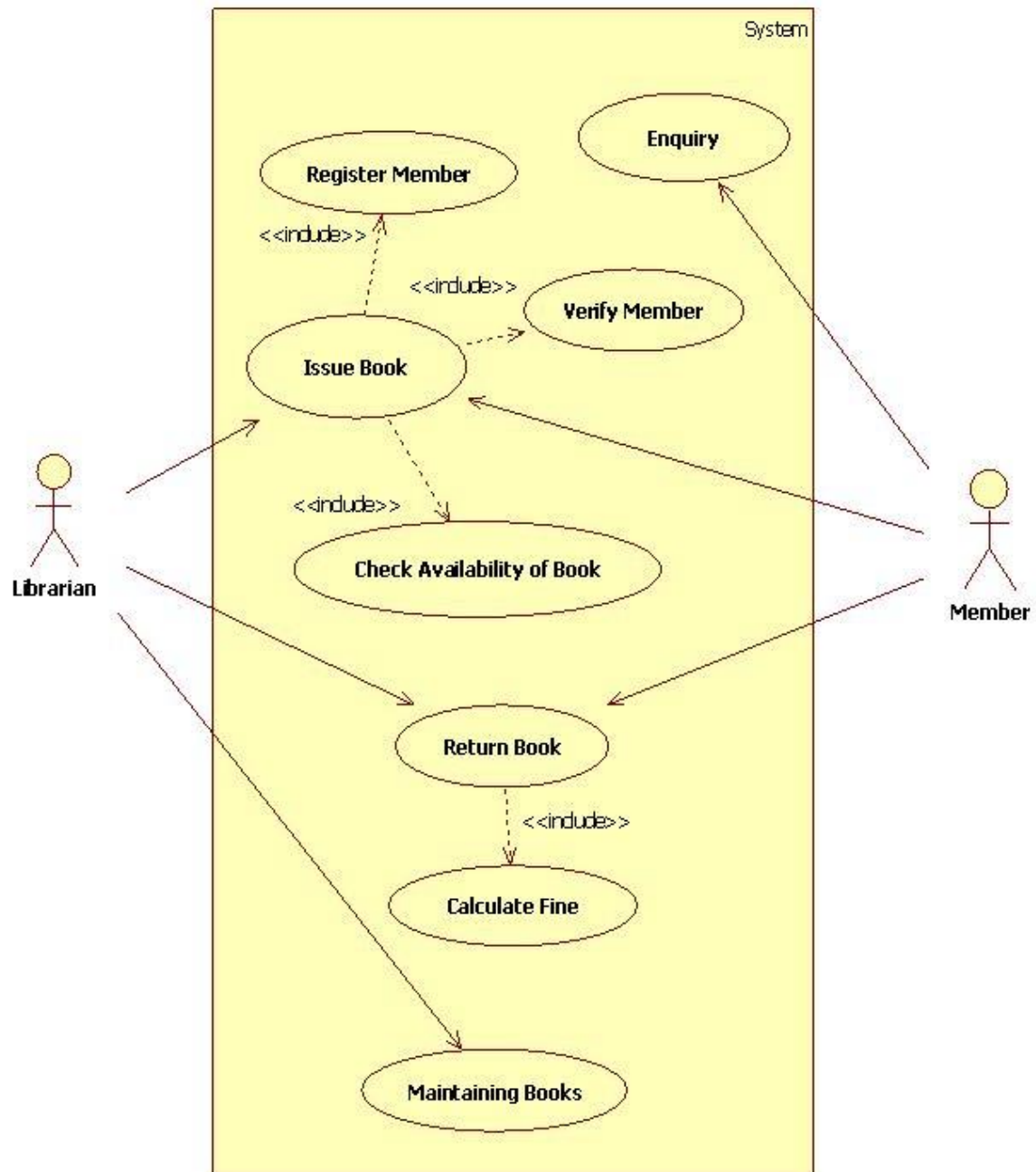


Figure: 5.4 use case diagram of the system

5.6 Sequence Diagrams

Sequence diagrams are a type of Universal Modeling Language (UML) diagram. They're used to show how objects in a system work together over time. A sequence diagram helps the designer of a system visualize and understand the order in which these interactions occur.

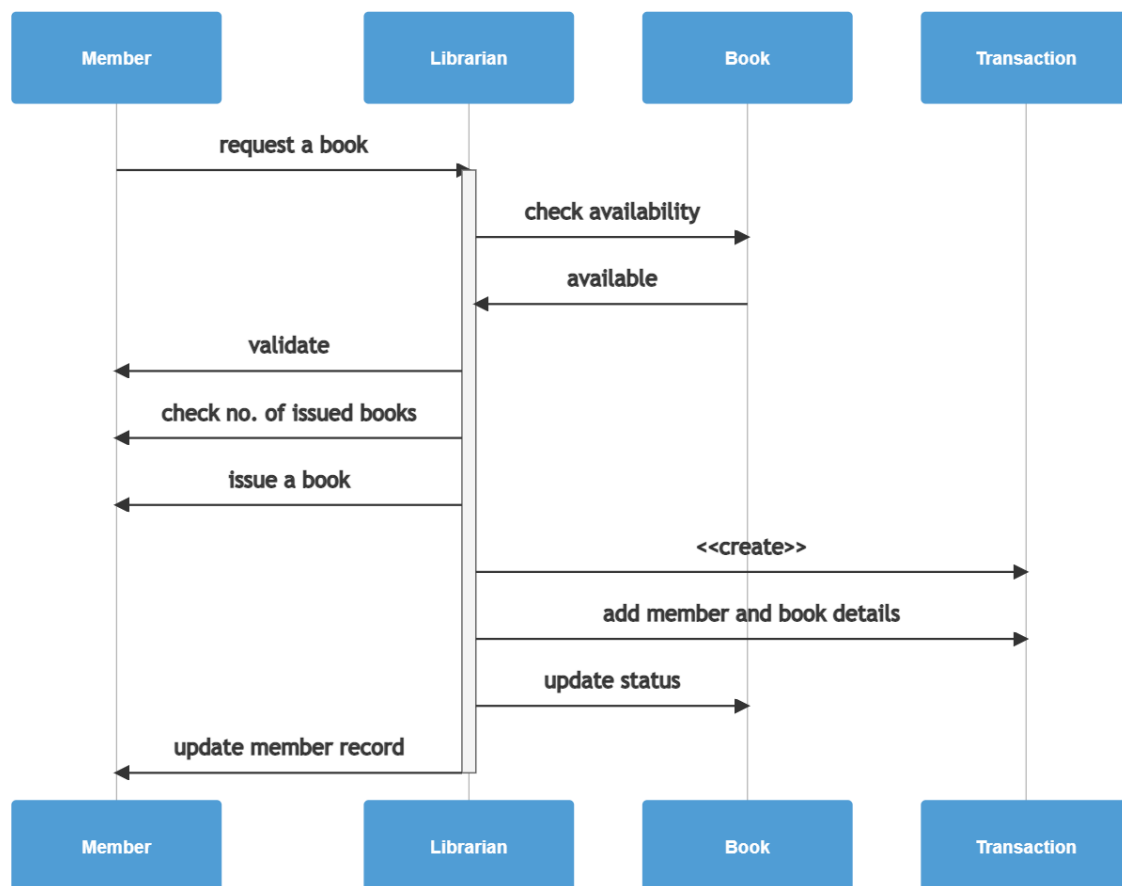


Figure: 5.5 Sequence diagram

CHAPTER 6

SYSTEM IMPLEMENTATION AND TESTING

6.1 Introduction

Implementation and testing are crucial phases in software development. Implementation involves coding, configuring, and deploying the software system. Testing ensures that the software functions correctly, meets requirements, and addresses potential defects or vulnerabilities. These phases ensure the successful development and delivery of a reliable software product.

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies or a finished product. It is the process of exercising software with the intent of ensuring that the software system meets its requirements and user expectations and does not fail in an unacceptable manner. These are the various types of testing. Each type of testing addresses a specific testing requirement.

- Testing is the process of executing a program with the intent of finding errors.
- A successful test is one that has a high probability of finding an as yet undiscovered error.
- Once source code has been generated, software must be tested to uncover and correct as much as possible before delivery to customer.
- The intent of finding maximum number of errors with the minimum number of efforts and time.

Internal program errors are exercised using “White Box Testing”.

Software requirements are exercised using “Black Box Testing”.

To perform testing, a set of Test Cases are designed to exercise. Both internal logic and external requirements. Test cases are documentation and design of internal logic and external requirement. Sometimes the techniques also refer to Cold tests. Therefore, testing and test case design is an admission of failure, which instills a good dose of guilt. Before we move on, let’s see some important yet known testing principles. All tests should be traceable to customer requirements. Testing should begin “In Small” and slowly move towards testing “In the Large”. Exhaustive testing is not possible. Poor tested software may cause several problems with user function which result in a serious threat to the organization developing the software, the threat may result in a serious disaster that may intent

the software towards failure.

6.2 Implementation

The purpose of System Implementation can be summarized as follows: making the new system available to a prepared set of users (the deployment), and positioning on-going support and maintenance of the system within the Performing Organization (the transition). At a finer level of detail, deploying the system consists of executing all steps necessary to educate the Consumers on the use of the new system, placing the newly developed system into production, confirming that all data required at the start of operations is available and accurate, and validating that business functions that interact with the system are functioning properly. Transitioning the system support responsibilities involves changing from a system development to a system support and maintenance mode of operation, with ownership of the new system moving from the Project Team to the Performing Organization. A key difference between System Implementation and all other phases of the lifecycle is that all project activities up to this point have been performed in safe, protected, and secure environments, where project issues that arise have little or no impact on day-to-day business operations. Once the system goes live, however, this is no longer the case. Implementation is the execution or practice of a plan, a method or any design, idea, model, specification, standard or policy for doing something. As such, implementation is the action that must follow any preliminary thinking for something to actually happen. This report focuses on the design and implementation of the library management system. It deals with the complete processes on building and implementing it. It focuses in the technical aspects of the system starting with identifying the necessary components and building the relevant relationship between or among them as needed for the smooth and efficient operation of the system. The system can keep track of the members joining and leaving the library, borrowing and returning of the books. Checking the availability of the books using different attributes as parameters. Finally checking of the overdue books and fines payable is another feature of the system.

The figure is the interface of admin/librarian login through which the admin should enter to the system with a valid username and a correct password.

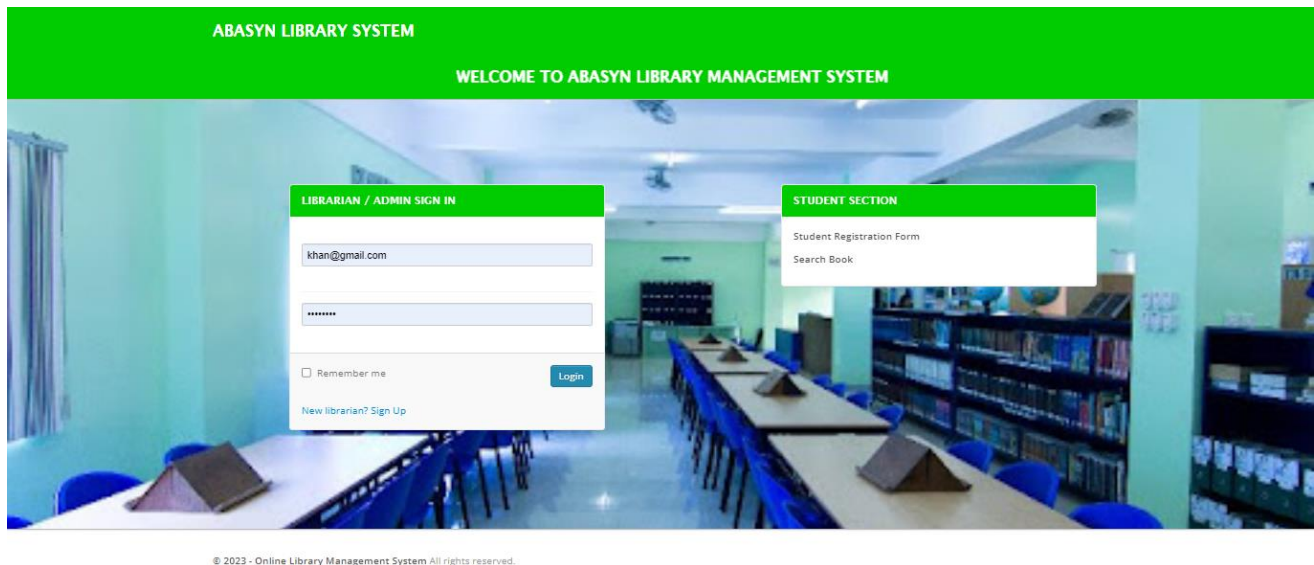


Figure: 6.1 Admin login penal

This is the interface of an admin dashboard which contain all the information related to the system that how many members are registered in a system and information of books in a library and all the issued and return books.

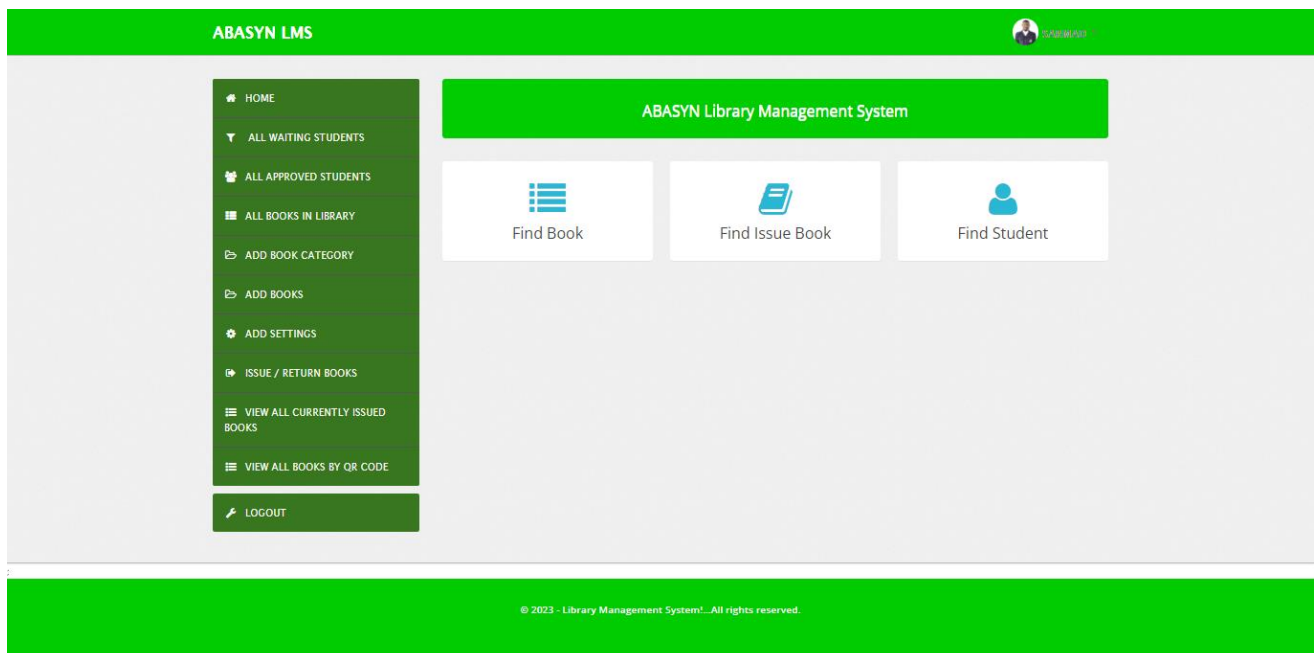


Figure: 6.2 Admin dashboard penal

This figure show the details of a books with book title, book type, author name, description and book code in a book that are present in online library system.

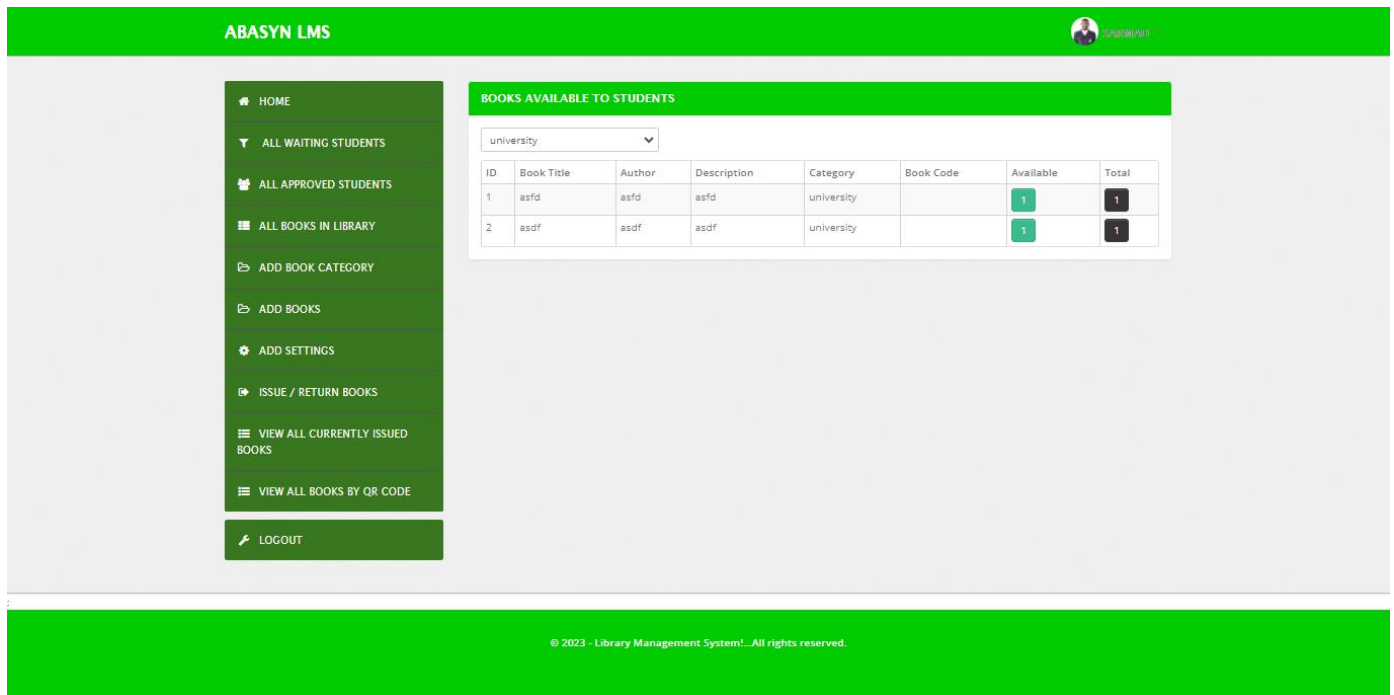


Figure: 6.3 Library Books penal

This figure shows the details of returned book that issued earlier and also check the issued books.

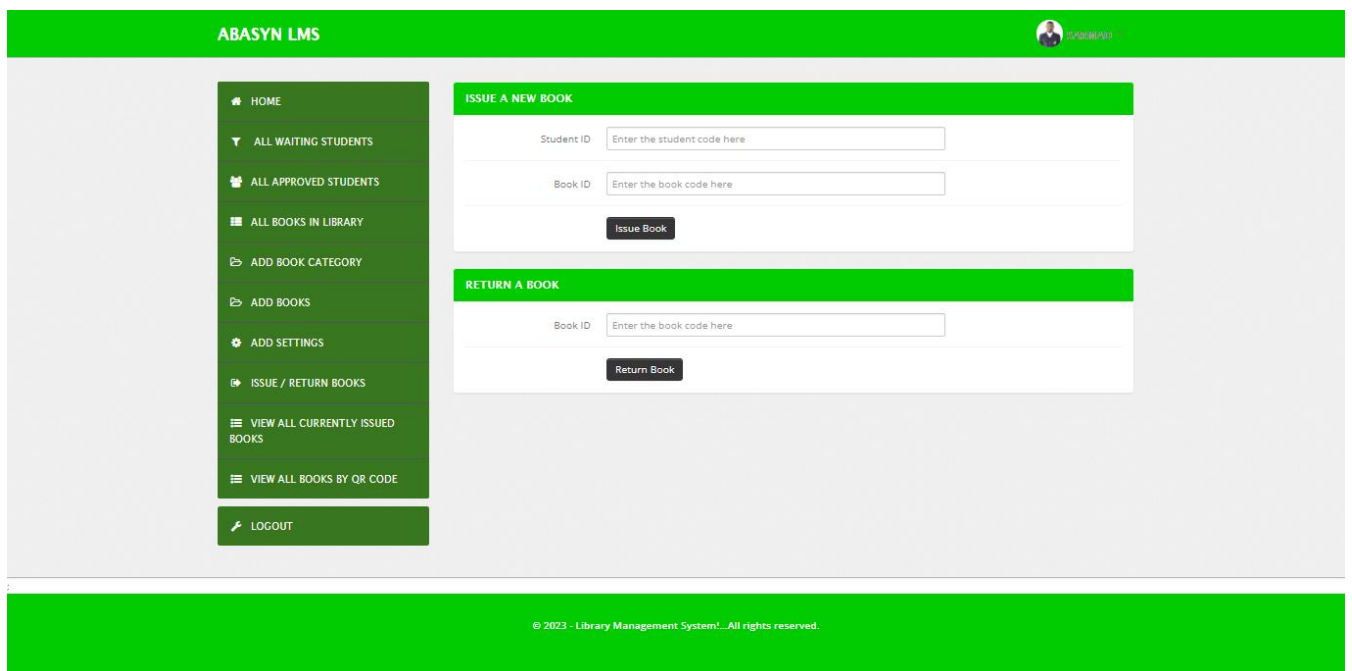


Figure: 6.4 Returned book interface

This figure shows the addition of a new book to the system by a librarian with a book id, ISBN number, book title, book type, author name, and number of issues etc.

Figure: 6.5 Book addition interface

6.3 Software Testing

This is the process that checks whether the system developed is the required results under known conditions. The purpose of testing is to identify and correct the errors of the system. In system testing, performance and acceptance standards are developed. It can take place when one is coding the program. One can code a module and run it to see whether it works perfectly. This does involve the process of inputting real data for testing the suitability of the module and the system as a whole. The system should work according to the specifications outlined in previous chapter under the system Requirements Specification document.

6.3.1 Objectives of System Testing

The system test should help to identify errors, faults, bugs and failures of the system so that it can be described as a successful test.

It should help to establish test cases for the system and also the test data to enable efficient and effective system test.

It should also help to establish resources required for performing the tests in the test plan. These resources include money required for man power.

The test schedule is also developed for performing the tests which allocates the time required for each part of testing and the procedures to be followed.

The system should also ensure consistency in the software that has been developed ensuring that there are no deviations from the specifications.

6.4 Testing Strategy

The test strategy consists of various tests that will ensure the system is tested appropriately in units and as a whole. This will assist to discover the uncovered errors in the system, unit modules and during their integration and as a whole

6.5 Test Plan

This does show how the program is to be tested and the procedure. The test data is identified, what is to be tested, the expected output and the actual results after inputting the test data. The system will be tested in a standalone machine where the database will be hosted locally first. For the majority of testing, there will be a small test in programs and this will be testing for compatibility. All test cases will be documented.

6.5.1 Types of Testing

Following are the types of testing to be perform for this online library management system.

6.5.2 Unit Testing

Unit testing is performed to test individual units of an application. Since the application comprises of various units and module, detecting errors in these unit is simple and consumes less time, as they are small in size. However, it is possible that the output produced by one unit becomes the input for another unit, hence if the incorrect output produced by one unit is provided as input in the second nit then also it shall be incorrect here. If this process is not corrected, the entire application may produce unexpected outputs. To avoid this all the units in an application are tested independently using unit testing. Unit testing is not just performed once during the application development but is repeated whenever the application is modified or used in new environment. Some other points that should be kept in mind are.

- Each unit is tested separately regardless of other unit of the application.
- The developers themselves perform these testing.
- The method of white box testing is done in this testing.
- It ensures that all statements in the unit have been executed at least once.
- It tests data structures that represents relationship among individual elements

- It ensures that the data entered in variables is of the same data type as defined in the unit.

6.5.3 Integration testing

This is testing two or more programs that depend on each other. In Integration testing components of the system are combined and tested in different ways. When you have programs and components of the network that depend on each other to perform a function then it is imperative to make sure that they work together correctly.

6.5.4 Security testing

System with sensitive information is generally the target of improper or illegal use therefore protection mechanisms are required to restrict unauthorized access to the system to avoid any kind of improper usage, security testing is performed which identifies and removes the flaws from the application that can be exploited by the intruders and thus results in security violation. Security testing focuses on to check whether the user can access only those data and functions for which the system developer or the user of the system has given permission this kind of security is referred to authorization.

6.5.5 System security

To check whether only the users who have permission to access the system are accessing it. These is referred to as authentication. Security is the main objective of any project. The importance of security testing is to stop unauthorized usages of data, means to ensure that the users only can access the data that is permitted by the system developer.

6.5.6 Load testing

Load testing is the process of putting demand on a system or device and measuring its response. Load testing is performed to determine a systems behavior under the normal and anticipated peak load conditions. It helps to identify the maximum operating capacity of an application as well as any bottlenecks and determine which element is causing degradation. When the load placed on the system is raised beyond normal usage patterns, in order to test the systems response at unusually high or peak loads, it known as stress testing. The load is usually so great that errors condition are the expected results although no clear boundary exists when an activity ceases to be a load test and becomes a stress test. This term may be used differently and here it's important to state that our application can work smoothly in any critical condition. We have to observe that the load testing is successfully passed by this application.

6.5.7 Acceptance testing

A test conducted to determine if the requirements of a specification or contract are met.it may involve

physical test or performance test. In systems engineering it may involve black-box testing performed on a system prior to its delivery. In this case of application acceptance testing performed by the customer shall be known as user acceptance testing, end user testing or field testing.

6.5.8 System Testing

System testing is where the entire system will be tested for functionality. In this final testing, it will be made sure that it can handle the predicted volumes of data quickly and efficiently.

6.6 Test Cases for Library Management System

The test for this online library management system login, book entry, book issue, book return, user account is following.

6.6.1 Login Form:

The test for login form is here.

Table 6.1 Login Form Test

SL.No	Test Case	Excepted Result	Test Result
1	Enter valid name and password and click on login	Software should display main window	Successful
2	Enter invalid	Software should not display main window	Successful

6.6.2 Book Entry Form:

The test for book entry is here.

Table 6.2 Book Entry Form Test

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data, if any Error like entering text data instead of number or entering number instead of text. Is found then it gives proper message otherwise Adds Record to the Database	Successful
2	On the Click of DELETE Button	This deletes the details of book by using Accession no.	Successful

3	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4	On the Click of SEARCH Button	Displays the Details of book for entered Accession no. Otherwise gives proper Error message.	Successful
5	On the Click of CLEAR Button	Clears all fields	Successful
6	On the Click of EXIT button	Exit the current book details form	Successful
7	On the Click of NEXT button	Display the next form	Successful

6.6.3 Book Issue Form

The test for book issue form is follow.

Table 6.3 Book Issue Form Test

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data, if the accession number book is already issued then it will giving proper msg.	Successful
2	On the Click of DELETE Button	This deletes the details of book by using Register no.	Successful
3	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4	On the Click of SEARCH Button	Displays the Details of issued book. Otherwise gives proper Error message.	Successful
5	On the Click of CLEAR Button	Clears all fields	Successful
6	On the Click of EXIT button	Exit the current book details form	Successful
7	On the Click of NEXT button	Display the next form	Successful

6.6.4 Book Return Form

The test for book return form is follow.

Table 6.4 Book Return Form Test

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data, if any Error like entering text data instead of number or entering number instead of text. Is found then it gives proper message otherwise Adds Record to the Database	Successful
2	On the Click of DELETE Button	Which deletes the details of book by using Register no.	Successful
3	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4	On the Click of SEARCH Button	Displays the Details of returned book ... Otherwise gives proper Error message	Successful
5	On the Click of CLEAR Button	Clears all fields	Successful
6	On the Click of EXIT button	Exit the current book details form	Successful
7	On the Click of NEXT button	Display the next form	Successful

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 Introduction

The newly developed library management system as discussed earlier solves problems experienced using manual based system as it provides for quick data generation that saves time. The security of the new system is catered for by supplying username and password to authenticate valid users and disallow invalid users to access the system. The system is user-friendly, and was designed in a way that it does not require much computer skills. The system has the capability to maintain a database of all archived books in the company by allowing the library coordinators to add, view, update, and delete from the database.

The newly developed system successfully implements the objectives of the study already stated by reflecting the current system procedures and interfaces for data manipulation, which has been put in place. Therefore, if the monitoring system is implemented and enhanced, there will be improvements in efficiency in monitoring of archived books by the library, hence timely decision- making based on timely and accurate reports.

7.2 Conclusion

The realities of digital information processing require that access is provided in a widely distributed manner, and it is up to the user to locate what is needed. The ability to call up all relevant information at the click of a mouse is a researcher's dream. The library management system project aims at developing a software infrastructure that enables those who manage and maintain such collections to make them electronically and publicly available. The entire library stands to benefit greatly from the system, because it will enable updates, retrieval, deletion, and generation of status reports according to the existing demands.

7.3 Future Work

- Integrate with learning management systems (LMS) - Allow students to access eBooks and other resources directly from within their school/university's LMS. This makes it more convenient for students and supports the learning process.

- Improved access for people with disabilities - Make the system more accessible for people with visual, hearing, mobility and cognitive impairments through tools like screen readers, sign language videos, large font/high contrast options, etc.
- Patron self-service portals - Develop a web portal where library patrons can manage their own accounts, view loan history, renew/request items and update contact info. This shifts routine tasks away from library staff.
- Enhanced digital story time - Create an interactive online storytime experience with read-along stories, videos, games and activities for young children. This can expand the library's educational programming.

REFERENCES

- [1]. Mrs Meenu Malik. "*historical development of library* ", Tika Ram College of Education Sonapat (ISSN 2321-9726).
- [2]. Bao Sun, JiangweiFeng and Ling Liu, "*A Study on How to Construct the Prediction Model of Library Lending of University Library*", International Conference on Information Science and Technology March 26-28, 2011 Nanjing. Jiangsu, China.
- [3]. Erxiang Chen, Minghui Liu, "*Research and Design on Library Management System Based on Struts and Hibernate Framework*", WASE International Conference on Information Engineering2009.
- [4]. JianhuZheng, YunqingFeng, Yun Zhao, "*A Unified Modeling Language-Based Design and Application for a Library Management Information System*", in cybernetics and information technologies.
- [5]. Michael Hitchens, Andrew Firmage. "*The Design of a Flexible Class Library Management System*", in IEEE conference 1998.
- [6]. Weihong Yang, "*Design and Implementation of Library Management System*", International Conference on Management Science and Innovative Education (MSIE 2015).
- [7]. Bretthauer, D. "*Open-source software in libraries. Library Hi Tech News*, 18 (5),8-9(2001).
- [8]. Barve, S., & Dahibhate, N. B., "*Open source software for library services*", *DESIDOC Journal of Library & Information Technology*, 32(5)(2012).
- [9]. Albee, B. & Chen, Hsin-liang, "*Public library staff's perceived value and satisfaction of an open-source library system*". *Electronic Library*, 32(3), 39.-402(2014).

- [10]. Singh, V., "*Expectation versus experience: librarians using open source integrated library systems*". *The Electronic Library*, 32 (5), 688-709(2014).
- [11]. Ching-yu Huang and Patricia A., "*Morreale A Web-based, Self-Controlled Mechanism to Support Students Learning SQL*" IEEE Integrated STEM Education Conference (ISEC)2016.
- [12]. Faisal, S. A. and Surendran, B (2008). *Automation of Library at Kendriya Vidyalaya Pattom Thiruvananthapuram* (Report), 15p.
- [13]. Kochtanek T. and Mathew J. (2002). *Library Information Systems: From Library Automation to Distributed Information Access Solution, 2nd ed.* U.S.A. Greenwood Publications, 611p.
- [14]. Munshi(2009).*Integrated_Library_System*(Internet),UNESCO.
www.odl.state.ok.us/servlibs/l-files/glossi.htm en.wikipedia.org/wiki/
- [15]. Odi, Amuse (1989). Library Automation: special libraries. *Journal of the National Association of Library and Information Science Student* (1)1, 2-13

