

AUTOMATED LIBRARY MANAGEMENT SYSTEM

FOR

MOUNTAIN TOP UNIVERSITY

BY

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE AND
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CERTIFICATION

This project titled, AUTOMATED LIBRARY MANAGEMENT SYSTEM FOR MOUNTAIN TOP UNIVERSITY), was prepared and submitted by **OSINUGA AYOMIDE AYANFEOLUWA** of matriculation number 18010301042 in fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE (Computer Science)** is hereby accepted.

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DEDICATION

This project work is dedicated to God Almighty.

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I sincerely want to appreciate God Almighty's presence with me during my four-year degree program at this excellent university, for his protection, provision, love, and encouragement cannot be purchased with money. Because his kindness endures forever (amen).

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I sincerely thank my wonderful parents, Mr. and Mrs. Osinuga, for their parental care, mentorship, and financial support. They are a source of inspiration and encouragement for me. I thank God for allowing them to live long enough to see my graduation. I pray to the good Lord to continue to bless them with long life and prosperity.

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ABSTRACT

A Library Management System (LMS) is software that allows you to search for books, manage books, monitor borrowed books, and pay fines and fees all in one location. It helps the librarian manage books and books borrowed by members while also automating the bulk of library functions. It improves efficiency, lowers library maintenance expenses, and saves both the user and the librarian time and effort. The goal of this project is to provide a system for handling all information about the Librarian, the students, and catalogs such as books, magazines, and newspapers. MySQL database, PHP, HTML, CSS, and JavaScript were used in the development of the web application known as Library Management System. The library management system will improve services for both users (e.g., students), and library management system will enhance services for both users (e.g., students) and staff (e.g., librarians), such as shortening the time it takes to find books and increasing the accuracy and timeliness of record generation, among other things. Libraries that are still using manual methods are recommended to transition to library management systems to stay up with the global trend of technical advancement.

Keywords: Library, Library Management System, Information Management.

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CHAPTER ONE

1.0 BACKGROUND TO THE STUDY

Humanity has always relied on books as a source of information. As a result, a library with well-preserved books plays a vital role. However, manually maintaining and managing a huge number of books may be difficult. As a result, library management systems were developed to deal with this issue (Le, 2020).

People with inquiries used to go to their local library, which was the most reputable source they knew before the emergence of online search engines. All you had to do was ask, and a reference librarian would either directly answer your query or direct you to a book that contained the information you were looking for (Vaughan, n.d.).

A library is a structured collection of information sources that are made accessible to the people (Beynon-Davies P. , 2002). Library usually holds the information physically or in a digitized format. In the previous period, access to the library was frequently used in the library room as technology developed the access mode changed to the computer system.

However, because a library is a fast-growing organism, traditional approaches for maintaining library systems are no longer dynamic or effective. The usage of a contemporary system has become essential for quick retrieval and sharing of information, as well as enhanced user support (Araya & Mengsteab, 2020).

Some may believe that libraries are becoming outdated as the prevalence of digital material over printed content grows. That conclusion, however, is incorrect! Yes, one of the most important functions of libraries is to store resources and materials. But, for millennia, the main goal of

libraries has been to provide locations and collections that enable the process of adding to human knowledge, not only to keep books (A Brief History of Libraries, 2018). Even as we go forward in the digital era, libraries and librarianship will thrive just as they have for millennia, by adapting to the forms of documentation and information seekers' demands of the moment.

Efforts have been made over the years at the gap between those with access to a computer and the internet and those without it, yet access to the internet and electronic information resources is still very expensive on the African continent. Despite the costly nature of information and communication technology (ICT) infrastructures, African institutions still expend a good part of their scarce resources to partake of the “goodies” that internet technology provides.

Librarians will continue to play a vital role in connecting people to the information they need as digital technologies advance. While a library may not have as many books and print archives for academics and readers to peruse, it will continue to function as a learning center (A Brief History of Libraries, 2018).

Electronic interfaces, improving standards and access protocols, purchasing and procurement methods, and cataloging systems have all evolved in reaction to technological improvements and user requirements. Users today demand tailored workflow-related delivery to the desktop, one-stop access to aggregated services, user-generated open content, and speed and immediacy of information discovery (JISC & SCONUL Library Management Systems Study, 2015).

Library Management System is an application that refers to library systems that are often small or medium in size. It is used by librarians to administer the library using a computerized system where he/she may record different transactions like issuing books, return of books, adding new

books, the addition of new students, etc. (Beynon-Davies P. , 2010). Books and student preservation modules are also featured in this system which would keep a record of the person in the library and also a full description of the books a library holds. With this library management information system there will be no loss of book records or member records which normally occurs when a non-computerized method is employed.

This system is open access for all users however to some extent system maintenance and generating different kinds of reports like lists of users registered and the addition of Books are only applicable to the admin. All these modules can help librarian to run the library with more ease and in a more efficient method as compared to library systems that are not computerized.

1.1 STATEMENT OF THE PROBLEM

This project will support and manage library transactions and services at Mountain Top University. The following are inherent problems discovered after cross-examination of some Library Management Systems and the use of the library.in response to the problem since the current manual library operations, services and transactions are enumerated below; difficulty in locating books in the library. For Mountain Top University; the internet usage duration is restricted, and the available system is not known by most of the students.

1.2 AIM AND OBJECTIVES OF THE STUDY

This work aims to create a system to manage all the information about the Librarian, the Students, and details of the book publication

The Specific objectives are:

1. To identify the requirements of the proposed system.
2. To specify the design of the system.
3. To implement the system.
4. To test the system.

1.3 METHODOLOGY

This project work will outline the various method in all the stages of Analysis and configuration of the device for the realization of an effective digital library system. The necessary step-by-step description of how to actualize the stated objectives of the research work will be carried out. A Library Management System will be designed using Windows Operating System, MySQL database, PHP, HTML, CSS, and JavaScript.

1.4 SCOPE OF THE STUDY

The study focuses on the design and implementation of a library management system for the cataloging section of Mountain Top University's library.

1.5 SIGNIFICANCE OF THE STUDY

This project is important in that it is of great benefit to the school and the students. It assists in decreasing the recursive job performed by the staff. It retains continuity between the distinct entry methods, i.e., by internet, at the desk, and across distinct physical places.

The study is going to birth a new Library Management System meant to provide efficiency in library operations. It will reduce some of the challenges connected with the traditional (manual) method of library management, which include the expense of equipment and personnel upkeep, and also allow institutions to handle the affairs of libraries easily.

1.6 DEFINITION OF TERMS

Application: Any content, item, or software that is intended for end users to utilize is referred to as an application. The computer software that delivers instructions and gives the user the means to carry out a job

Management: This is the process of organizing, planning, directing, carrying out, and monitoring any system.

Database: Software that stores, retrieves, and modifies databases is known as a database.

Computer: an electrical device that processes data and does computations; it executes instructions from a program to carry out a series of mathematical and logical operations.

Software: This is a read-write memory that is used to hold written instructions, rules, or processes that govern how a computer system operates.

Server: A server is a computer that allows client stations in a computer network access to shared resources like files and printers.

Information: Information is a term used to describe text that is instructive to the reader or the machine processing it. It is shortened as info. Text that is instructive to a human reading it or a machine processing it is referred to as information, or info.

User: The term "user" in this context refers to either library patrons or library workers. Additionally, it refers to the user of the application (e.g., library staff).

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

When it comes to global competitiveness, organizations all over the world employ advanced science and technical functions to compete. The most common use of technology is evident in data and communication technologies to manage and track library operations. This section talks about computer-based information systems, conceptual review of a library, benefits of the library management systems, few related works.

2.2 COMPUTER-BASED INFORMATION SYSTEM (CBIS)

An information system that relies on computers to perform part or all of its intended duties is known as a computer-based information system. A computer-based information system's fundamental building blocks include its hardware, software, databases, networks, and procedures. These four elements—hardware, software, database, and network—combine to form the information technology platform, which is a part of a computer-based information system (CBIS). These elements might then be used by information technology professionals to build information systems that keep an eye on risk management, safety protocols, and data management. Information technology services are those acts (Computer Based IS (CBIS), 2013). Information technology is a key instrument in the Information Society. They have the power to drastically alter every aspect of human activity. Developing a strategy for the advancement and use of information technology in all aspects of human existence is a critical topic in strategic planning at both the national and global levels. The people, their wants, challenges, and preparedness for change increasingly dictate the speed and directions of change rather than only

computer science, telecommunications capabilities, and software tools. In this regard, the importance of computerization of the educational domain as a significant societal resource cannot be overstated (MANDIC, 2012).

2.2.1 TYPES OF INFORMATION SYSTEM

A data and information system is a collection of people, equipment, software, communication devices, networks, and data assets that process (store, retrieve, and convert) data and information for a specific purpose. An information system, on the other hand, is a collection of resources, both technological and human, that are used to gather, process, store, retrieve, and disseminate information in an organization to enable decision-making and control (Examples Of Computer-Based Information Systems | ipl.org, n.d.). The following are types of computer-based information systems:

2.2.1.1 TRANSACTION PROCESSING SYSTEM

Transaction processing is a method of splitting labor into discrete, indivisible tasks known as transactions. TPS stands for Transaction Processing System. It is software that processes data in an online recording system to keep track of transactions (White, 2019). A transaction process system (TPS) is an information processing system for business transactions that gathers, alters, and retrieves all transaction data. (What is a Transaction Process System (TPS)? - Definition from Techopedia, 2019). This system records day-to-day transactions such as customer orders, invoicing, inventory levels, and manufacturing outputs. The TPS assists managers by

establishing databases that act as the foundation for numerous information systems (LYNDA, 2010). Examples include sales order entry, hotel reservation systems, payroll, employee record keeping, and shipping.

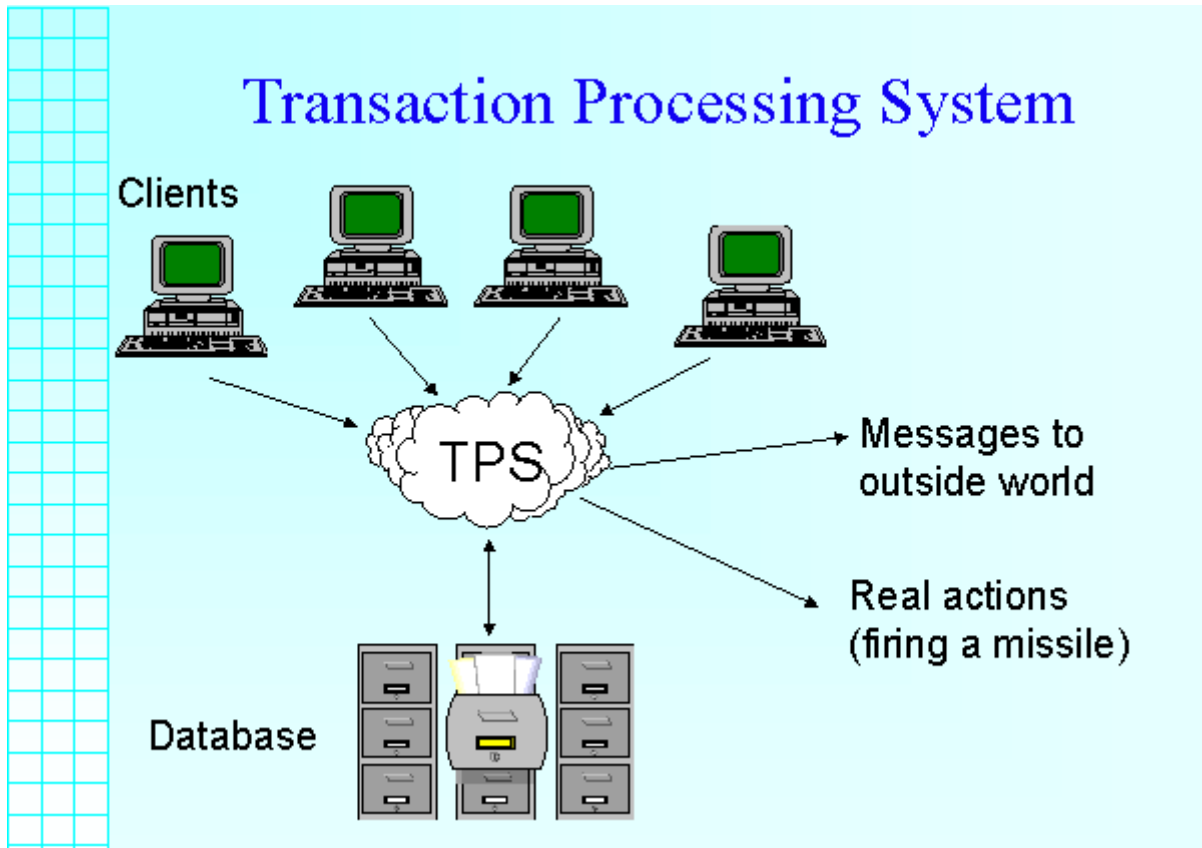


Figure 2 |Transaction Processing System

2.2.1.2 MANAGEMENT INFORMATION SYSTEM

A management information system (MIS) is a computerized repository of financial data that has been organized and programmed to generate regular operational reports for all levels of management within a company. Obtaining unique reports from the system is also usually straightforward. For middle-level managers, MIS summarizes detailed data from transaction processing system standard reports. Production schedules and budget summaries may be included in such reports.



Figure 2 2 Management Information System

2.2.1.3 DECISION SUPPORT SYSTEM

A decision support system (DSS) is a computer program application that analyzes and presents company information to consumers to help them make business decisions. It is referred to as an "informative application" (to differentiate it from an "operational application" that gathers information during normal business operations). These are specially designed to aid managers in making decisions when the prospective repercussions of such choices are unknown. DSS offers tools and strategies to help collect relevant data and analyze choices and alternatives. DSS frequently includes the creation of "what-if" models using complicated spreadsheets and databases. (EMMANUEL, 2019). The DSS is a versatile analytical tool. The DSS assists middle-level managers and others in the organization in analyzing a wide variety of challenges, such as

the consequences of external events and trends. The DSS, like the MIS, is based on comprehensive data from the transaction processing system (LYNDA, 2010).

2.2.1.4 EXECUTIVE SUPPORT SYSTEM

The ESS is a simple system that provides information in a very summarized way. It assists senior management in overseeing the company's activities and developing strategic strategies. The ESS integrates internal and external data from TPS and MIS (LYNDA, 2010). An expert system assists business executives in locating solutions to non-routine issues, allowing them to decide to improve the company's performance. An executive support system, as opposed to a DSS, has enhanced communications and computer capabilities. An executive system information system controls all of the information required for business executives to monitor the competition, assess internal performance, and identify development prospects. (Christiansen, 2021).

2.3 CONCEPTUAL REVIEW

This section breaks down the topics into smaller chunks and explains. It describes the notion of a library management system, as well as all of its associated concepts.

2.3.1 LIBRARY MANAGEMENT

Library management is the application of management ideas and practices to the context of a library. It entails making decisions and directing the work of others. The five basic management functions are as follows: Planning, organizing, staffing, leading, and controlling.

2.3.2 LIBRARY MANAGEMENT SYSTEM

Library management systems assist libraries in keeping track of their document inventory and loans, as well as member subscriptions and profiles, which may be spread over numerous

physical locations. Libraries at educational institutions, as well as public and private libraries, can employ this sort of software. Library clients use library management systems to locate, reserve, and loan materials, while library personnel uses them to handle document acquisition, categorization, and inventory.

2.3.3 COMPONENTS OF LIBRARY MANAGEMENT SYSTEM

This sub-chapter breaks down the principles and explains them thoroughly. It thoroughly describes the concept of a Library Management System and all of its related aspects.

2.3.3.1 DATABASE

A database is a logically connected collection of records or objects. A database is critical for an automated library system since it stores all of the fundamental information about books.

2.3.3.2 NETWORK

A computer network is a group of two or more computers that are connected to exchange data electronically. A network system, in addition to physically linking computer and communication devices, plays a critical role in developing a unified architecture that allows a range of equipment types to communicate information in a near-seamless method (Britannica, 2019)

2.3.3.3 SERVER

A computer or computer software that administers or regulates access to a network's centralized resource or service. You can share your library's e-resources with other libraries that are linked to the server by utilizing the server.

2.3.3.4 PEOPLE

Every Library Management System requires humans to function properly. Most of the time, the most disregarded component of the library Management system is the people: this is perhaps the component that has the most effect on the LMS's success or failure.

2.3.3.5 SOFTWARE

Software is a collection of computer programs and related data that instructs a computer on what to do and how to accomplish it. The usage of computer software is critical for constructing an automated library collection.

2.3.3.6 COMPUTER

A computer is an electronic device that can accept data, store data, and automatically execute an instruction, to perform a mathematical, logical, or manipulative operation to produce output. A computer system consists of several individual components performing a particular function (islmblog, 2016).

A computer system has input, output, storage, and processing components as the basic elements.

Some of them are as:

a) Input device: A device that can be used to insert data into a computer or other computational device. Some of the common input devices are:

Keyboard: A device consisting of a set of keys on a typewriter or typesetting machine or computer that enables us to enter data into a computer. The keyboard is the most commonly used input device.

Mouse: This is a hand-operated electronic device that controls the coordinates of a cursor on your computer screen as you move it around.

Optical Character Reader (OCR): This is a device that automatically recognizes and interprets text that has been converted into a digital form by a photoelectric scanner device, that converts light patterns into digital signals for a computer.

Bar-code Reader: A bar-code reader is an electronic device that can scan bar codes on products and convert the information into a digital format for processing by a computer.

Scanner: Scanner is an electronic device that allows a computer to generate a digital representation of an image for data input to a computer.

b) Output device: An output device is any peripheral device that converts machine-readable information into a people-readable form. This is a piece of electronic or electromechanical equipment that is connected to a computer and used to transfer data out of the computer in the form of text, images, sounds, or other media. Some commonly used output devices are:

Monitor: The monitor is the commonly used display device. A screen is used to display the output of a computer to the user. This is a device that takes signals and displays them on a television screen or a computer screen.

Printer: This is an output device that prints (hardcopy) the result of data processing on a paper sheet. Catalog Card or Bibliography can be prepared using a printer

Central Processing Unit: This is the main part of a computer that does most of the data processing (controlling and executing operations). It is also called the brain of a computer.

Storage / Memory: A computer system has several memory devices that store instructions and data for the system's operation.

These devices are essential for a Library Management System since they allow you to store books, journals, and papers in digital format.

2.4 BENEFITS OF LIBRARY MANAGEMENT SYSTEM (LMS)

- 1) **Quick & simple to use:** The Library Management System is simple and user-friendly, and can thus be simply integrated into your existing system. The benefits of a library management system include online and offline storage and simple upgrades that simplify and improve the learning experience.
- 2) **Error-free:** The automated library software is simple to use, strong, and designed for simple data entry, resulting in error-free library operations.
- 3) **Fully Customizable:** The library management system is entirely flexible and adaptable to the demands of educational institutions to give rapid, accurate results.
- 4) **Increased Library Engagement:** By giving students 24/7 access to library materials from anywhere, at any time, you may avoid irritation and tediousness. The librarian may manage all kinds of books, eBooks, journals, images, videos, and events with library management software.

- 5) **Mobile Access:** The library administration system provides mobile access via smartphones and tablets to check the library catalog, scheduling, books, and services whenever and wherever you choose.

2.5 RELATED WORKS

Tsega Weldu Araya and Adhana Mengsteab designed A web-based Library Management System in 2020 to address various limitations of physical libraries, such as meeting users' demands, and most hard copy volumes are wrecked after a short time of usage. They designed parameters using Java Programming Language, PHP, HTML, and MYSQL Database. In ACCE, they recommended the web-based LMS to eliminate paperwork in the library, reduce the high demand for book expenses, and minimize problems with missing data (Araya & Mengsteab, 2020).

Tan Chaur Chuan contributed to the Library Management System in 2010. The system was developed to improve the management of the library's book collection and to keep track of members and daily book transactions. The Waterfall model was employed as the system's development approach. This technique has various advantages and disadvantages as compared to the current library system, such as the lack of smart card technology. We can enhance the system in the future by using smart card technology (Chuan, 2010).

A Library Management System (LMS) was designed in 2020 by Shanmugam A.P, Ramalakshmi A, Sasthri G, and Baalachandran S using Dot Net technology; the front-end application was created in C#, and the SQL server was used as the database. Because Traditional libraries required students and patrons to spend time looking for books, and there was no effective

database administration for issues or penalties. It was challenging to create a report promptly because of the slow overall work speed. The book sales required the librarians to work hard organizing and categorizing books. They also had to simultaneously review and keep an eye on the fine print in the lend/borrow book material. It was time-consuming to work in several areas at once. The technology contributes to the development of a new way of establishing digital libraries. They wanted to strengthen the LMS in the future by integrating it with the LAN, which increases the system's effectiveness.

CHAPTER THREE

3.0 INTRODUCTION

The design of a web application for monitoring and managing library activities. The mechanism through which users and librarians may utilize and oversee library operations is changing dramatically as information and technology improve. The increased use of ICT in schools and libraries has resulted in an improvement in the quality of library services. It describes the tools that were used in the development and implementation of the web application. These tools helped in the system design and development of the app's basic concept and functionality to achieve its stated purpose. The prototype model was used in the development of this system. The design of this system is based on the model shown below.

3.1 SYSTEM ARCHITECTURE OF LIBRARY MANAGEMENT SYSTEM

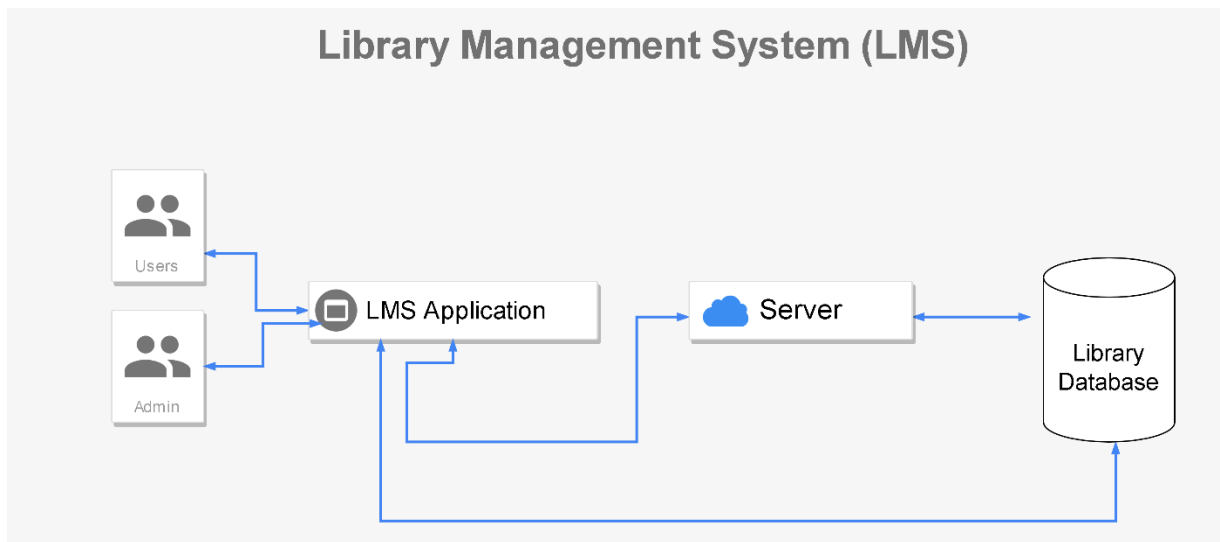


Figure 3 1 Architecture of the Library Management System

3.1.1 AUTHENTICATION

The authentication of users on the system is performed in two ways:

1. Username
2. Password

After signing up for the system, the user enters the password and username they used to register to access the Library Management System.

3.2 USE CASE DIAGRAM

A use case in the Unified Modelling Language can represent the specifics of your system's users (also known as actors) and their interactions with the system (UML). A collection of specific symbols and connections will be required to build one.

3.2.1 USE CASE DIAGRAM FOR USER AND ADMINISTRATOR

Users should be able to create an account on the system, log in and out of the application, browse the catalog, and conduct catalog searches for resources like books, magazines, and newspapers, among other functions. The system administrator should have access to the system via a login page, allowing them to upgrade the system, add and delete users and catalogs (such as books, magazines, and newspapers), and update user and catalog information.

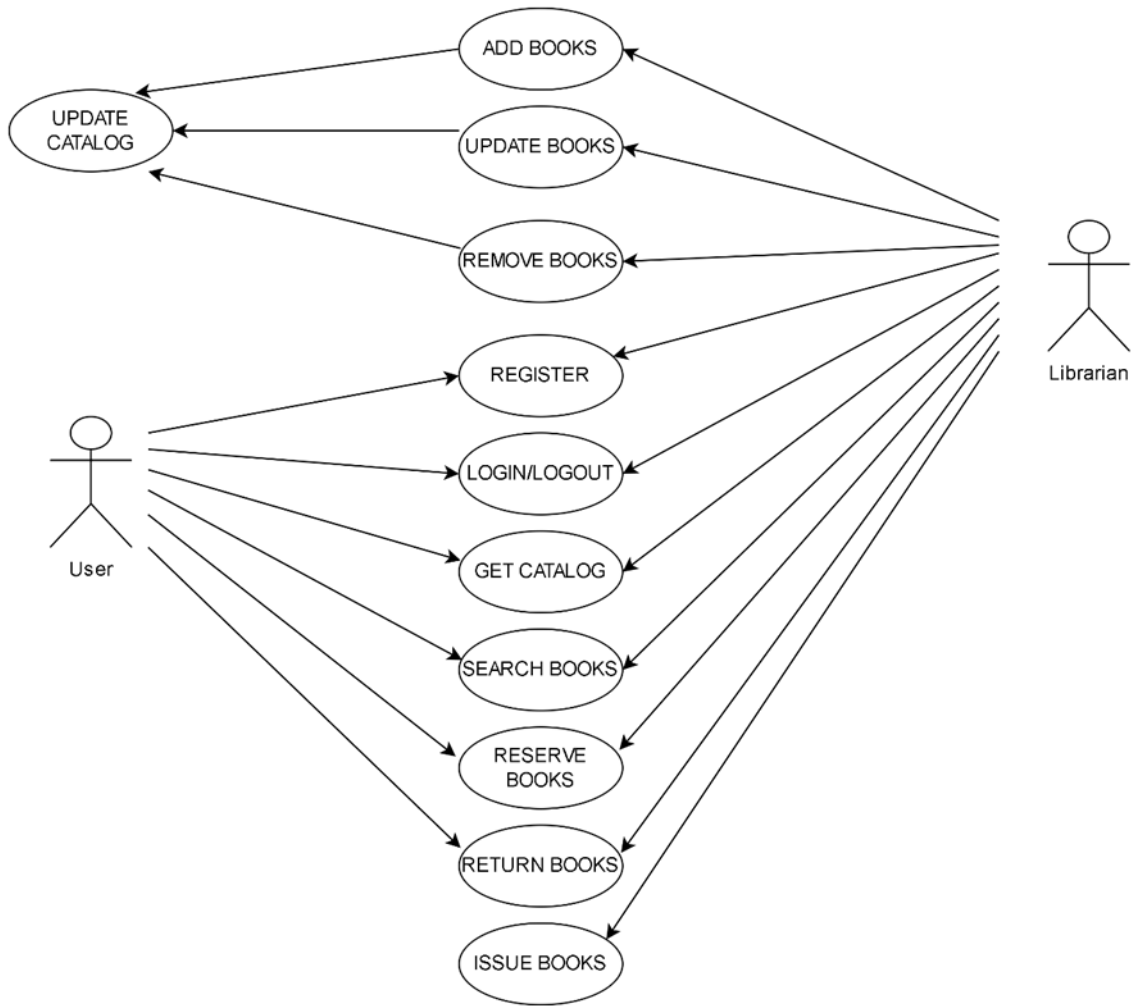


Figure 3 2 Use case diagram for User and Administrator

3.3 E-R DIAGRAM OF THE LIBRARY MANAGEMENT SYSTEM

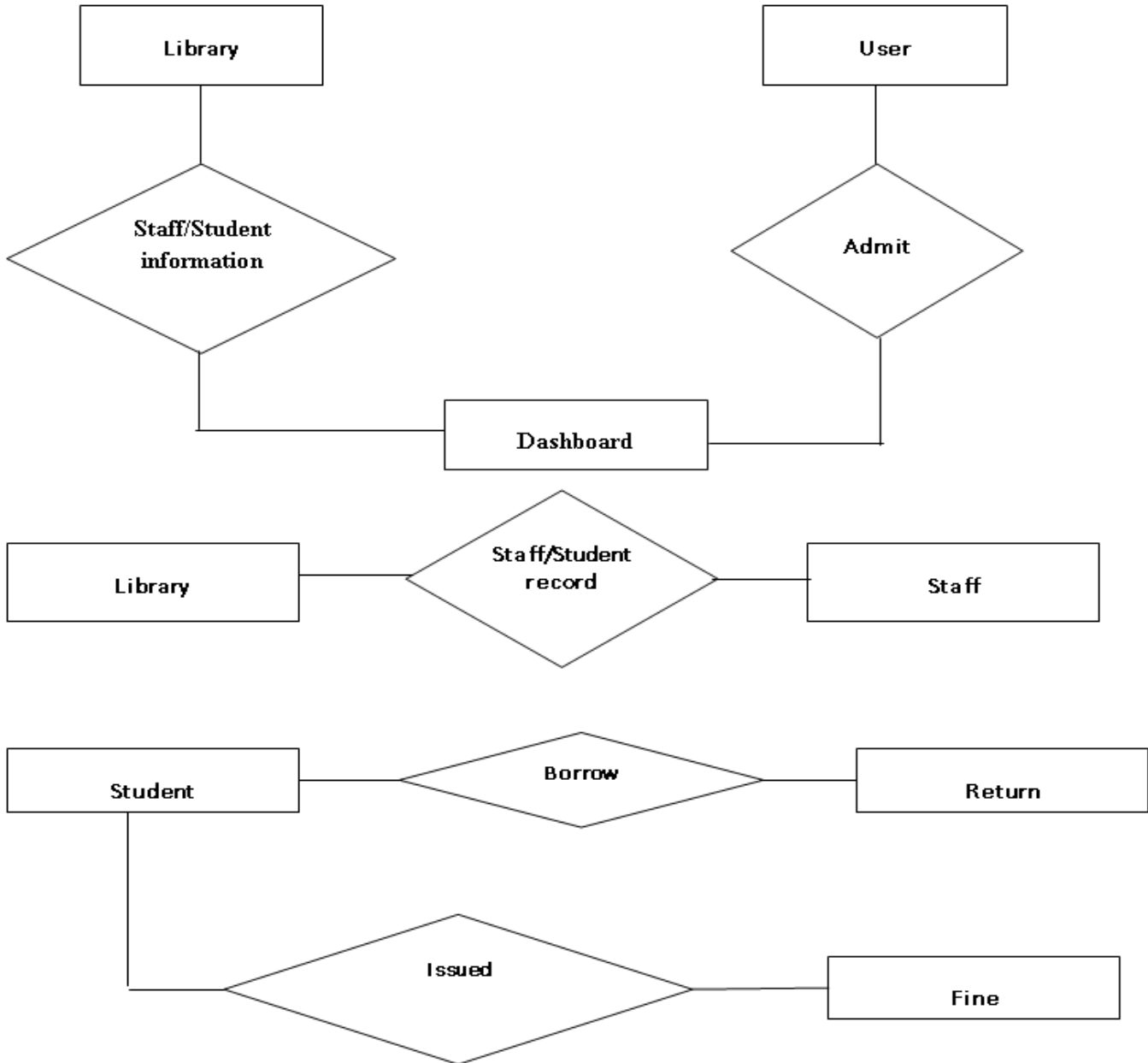


Figure 3.3 Entity-Relationship Diagram

3.4 FLOW CHART DIAGRAM OF LIBRARY MANAGEMENT SYSTEM

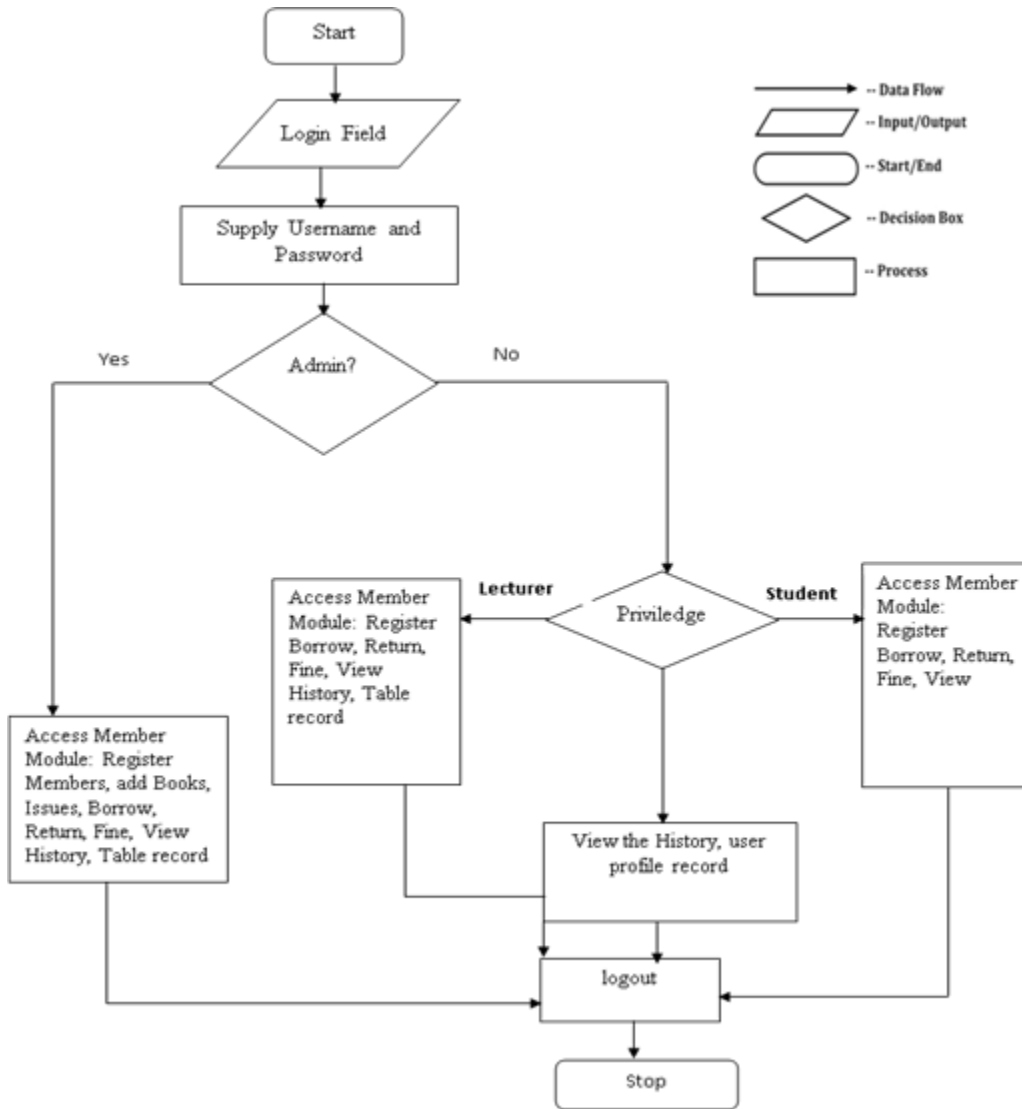


Figure 3 4 Proposed System Flowchart.

3.5 SOFTWARE DEVELOPMENT LIFECYCLE

The system is being implemented using a prototyping methodology. The prototype process entails an early approximation of the final system. The prototype is developed, tested, and revised until the user deems it appropriate for the final system. It also builds the foundation for the final system or program (Martin, n.d.). This straightforward procedure may be performed again until the desired outcome is achieved. The prototype process is most commonly utilized when project requirements are not fully understood or when some specifics need to be addressed. It is also used to create online interactive transaction processing systems, web-based applications, and other real-time projects. It enables users to quickly check design requirements as development progresses. In the industry, many sorts of software prototypes are employed.

The SDLC stages for the Prototyping Model are as follows:

1. Requirement gathering
2. Quick Design
3. Build Prototype
4. User Evaluation
5. Refining Prototype (Iterate 4 and 5 until)

6. Implement and Maintain

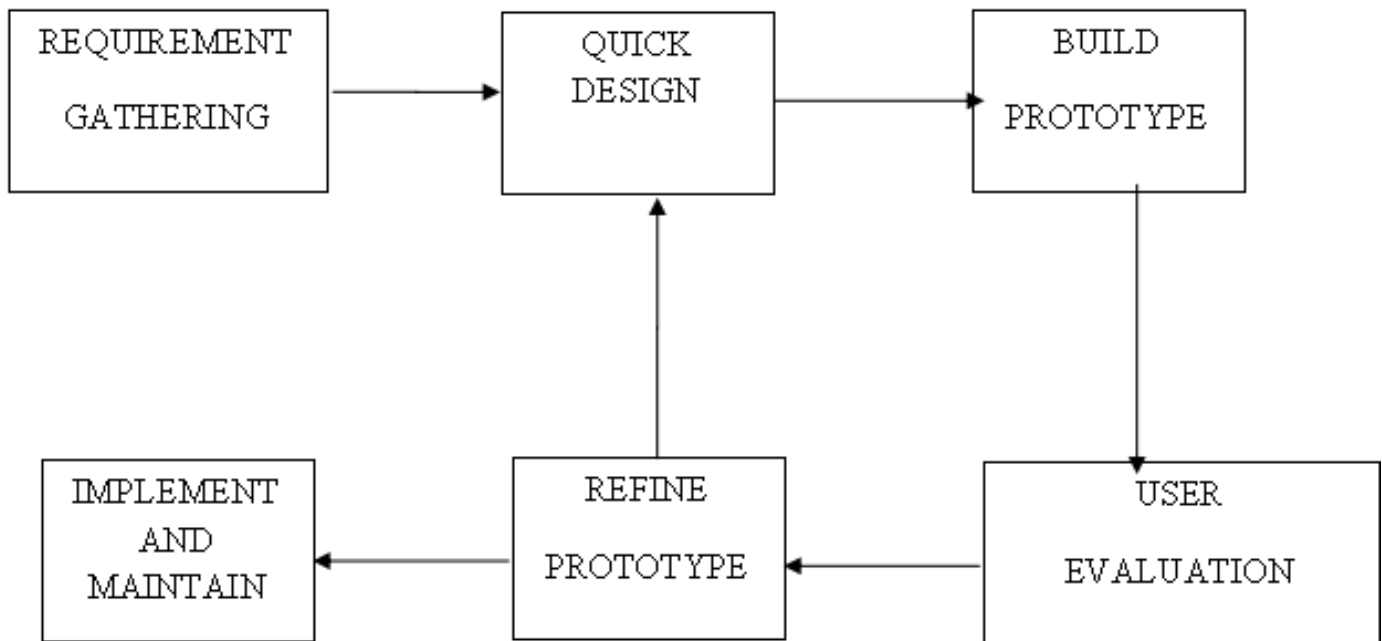


Figure 3 5 The Prototyping Methodology

3.5.1 TYPES OF PROTOTYPING METHODOLOGY

The following are the most common forms of software prototyping:

1. Incremental Prototyping:

Incremental prototyping is the process of creating several working prototypes of different subsystems and then fusing them to create a whole system (SDLC - Software Prototype Model - Tutorialspoint, 2019). In incremental Prototyping, the final product is decimated into different small prototypes and developed individually. Eventually, the different prototypes are merged

into a single product. This method is helpful to reduce the feedback time between the user and the application development team sticky (Martin, n.d.).

2. Extreme Prototyping:

The web development industry makes use of extreme prototyping. There are three successive phases to it. First, an HTML-formatted basic prototype of all the current pages is shown. Then, a prototype services layer is used to mimic the data processing. The services are finally put into use and incorporated into the finished prototype. Extreme prototyping is a technique used to highlight the second stage of the process, in which a completely working user interface is created with minimal care for the actual services system (SDLC - Software Prototype Model - Tutorialspoint, 2019).

3. Throwaway/Rapid Prototyping:

Throwaway prototyping is also known as quick prototyping or close-ended prototyping. To construct a prototype, this sort of prototyping requires relatively little labor and little requirement analysis. The prototype is abandoned once the actual needs are known, and the actual system is created with a much clearer grasp of user requirements (SDLC - Software Prototype Model - Tutorialspoint, 2019).

4. Evolutionary Prototyping:

Evolutionary prototyping, also known as breadboard prototyping, is centered on creating working prototypes with basic features first. The produced prototype serves as the framework for subsequent prototypes, upon which the full system is built. The well-known needs are added to

the prototype by applying evolutionary prototyping, and new requirements are added as and when they are understood (SDLC - Software Prototype Model - Tutorialspoint, 2019). This model is useful for projects using new, poorly understood technologies. It is also employed in complicated projects when each function has to be verified just once. It is useful when the demand is not steady or first not understood well (Martin, n.d.).

3.5.2 ADVANTAGES OF PROTOTYPING MODEL

Here are a few key advantages of employing prototyping models:

1. Users actively participate in development. As a result, problems may be spotted early in the software development process.
2. Missing functionality can be found, lowering the chance of failure. Prototyping is also seen as a risk-reduction exercise.
3. It assists you in determining the system's lacking functionality.
4. It also indicates the functions that are hard or challenging. Encourages creativity and adaptability in design.
5. Prototypes may provide early training for future software system users.
6. Because it is a simple model, it is simple to grasp.

3.6 LIBRARY MANAGEMENT SYSTEM REQUIREMENTS ANALYSIS

This phase involves studying and comprehending what users anticipate the system to perform for them, as well as outlining what the system needs to work effectively and efficiently. It includes learning about the functional and non-functional needs of the system.

3.6.1 FUNCTIONAL REQUIREMENTS

A functional requirement is a statement of the intended use of a system and its components in software and systems engineering. This is used to explain how the LMS works or what it does.

The following are the app's functional requirements:

1. User registration must be handled by the system.
2. The system must permit the user to log in.
3. The system grants access to users depending on their jobs.
4. The system allows the user to search for books, periodicals, and newspapers that meet their requirements.
5. The system administrator must be able to add books, magazines, and newspapers to the system.
6. Users can access the system by using a unique username and password saved in the database.

3.6.2 NON-FUNCTIONAL REQUIREMENTS

These are criteria that the system should meet but do not have a significant impact on the functionality of the software. They are the expected features of the software that users make assumptions about when using the system.

These are the requirements:

1. Low cost: the system is open-source. As a result, using the system is free. The approach also helps to lower the amount of money spent on the program when compared to the previous way.
2. Storage: All data collected by the system is saved in a database.
3. Accessibility: Because the system is web-based, it is available to everyone who has a system.
4. Role Management System: The system must control user functions depending on their roles.
5. Security: The system must protect the security of the user's account by encrypting the password.
6. Usability: The system must include a straightforward and easy-to-navigate interface.

3.7 USER REQUIREMENTS

The need to understand user needs is a critical component of information system design and is critical to the success of any system. The system was created for users who require assistance in administering and monitoring the library's activity. The system was developed to be unilingual, with English as the preferred language.

3.8 SYSTEM REQUIREMENTS

This section describes the software and hardware requirements of the system

3.8.1 HARDWARE REQUIREMENTS

1. A PC, tablet, or any mobile device
2. Processor: 1GHz 32bit (x86) processor
3. Hard disk: 100GB or higher
4. RAM: 1GB or higher

3.8.2 SOFTWARE REQUIREMENTS

1. An operating system
2. A web browser

3.9 LIBRARY MANAGEMENT SYSTEM DESIGN AND TOOLS

The Library Management system was built as a web application using front-end languages such as JavaScript, HTML, and CSS. To populate the system's database, MySQL was used as the Database Server, PHP as the Scripting Language, an phpMyAdmin for database management,

Google Chrome as a web browser, and Apache as the Web server. A database is a structured collection of data that is accessible digitally and stored on a computer system.

HTML: This is the markup language we use to structure and define our online content, such as creating paragraphs, headers, and data tables, or embedding images and videos.

CSS: CSS is a style rule language that we use to customize our HTML content, such as setting background colors and fonts and organizing it in several columns.

JAVASCRIPT: JavaScript (often abbreviated to JS) is a scripting language that is mostly utilized on the Web. It is typically seen integrated into HTML code and is used to improve HTML pages. JavaScript is an object-oriented, lightweight, interpreted language with first-class functions. As a result, it does not need to be compiled. JavaScript is used to create interactive and dynamic websites.

MYSQL: MySQL is an open-source relational database management system based on SQL. It was designed for web applications and works on any platform. As new and diverse requirements emerged with the internet, MySQL became the platform of choice for web developers and web-based applications (What is a database?, 2021).

phpMyAdmin: phpMyAdmin is a free PHP software utility designed to manage MySQL administration via the Web. phpMyAdmin offers a wide variety of MySQL and MariaDB operations. Frequently used activities (managing databases, tables, columns, relations, indexes, users, permissions, and so on) may be conducted using the user interface, yet any SQL expression can still be executed directly (contributors, 2019).

CHAPTER FOUR

4.0 INTRODUCTION

This chapter entails the outcome of the mentioned aims. This section covers the result new system as intended, as well as the process description.

4.1 CHANGEOVER PROCEDURE

During the transition, the system will coexist with the existing manual system. The initial stage of the transition necessitates a significant amount of data entry in order to populate the database.

Following that, a training session for the library's staff who will be using the system will be required. The system administrator will supervise the transition period procedure and provide reports on failures as well as user efficiency/proficiency.

4.2 SYSTEM INSTALLATION

The system operates as a web-based application. As a result, it operates on the fundamental web architecture. The Web-server acts as a go-between for the web pages (web browser) and the database server.

The Web-server acts as a go-between for the web pages (web browser) and the database server.

The web pages loaded by the browser constitute the application's front-end or the application's interface with the user. It generates HTML-formatted pages (files). The database server serves as the back-end, storing the web content. The web server sits between the front-end and the back-end, running scripts to query the database, collect data from the Webpage, or display information on the Webpage for the end user. All Webpage requests must go through the web server.

Before we can install such an application, we must first install and configure the database server (MySQL), web server (Apache 1.3), and scripting language interpreter (PHP). The application XAMPP server was used for this. XAMPP is a ready-to-run application that installs and configures MySQL, Apache, and PHP on the system.

After installing XAMPP, copy the program to the htdocs folder inside the XAMPP folder on the server system, i.e., for local host servers. The program file should be copied to the C:xampphtdocs directory, which is the XAMPP directory on most systems.

4.3 SYSTEM INTERFACES

Login Interface

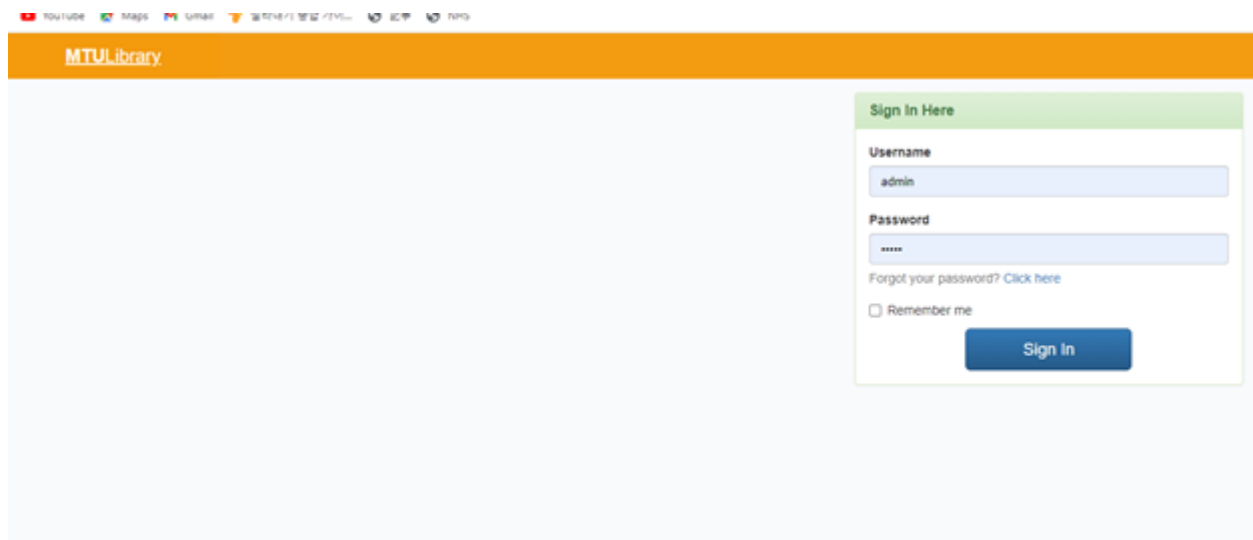


Figure 4 1 Login Interface

Home Page

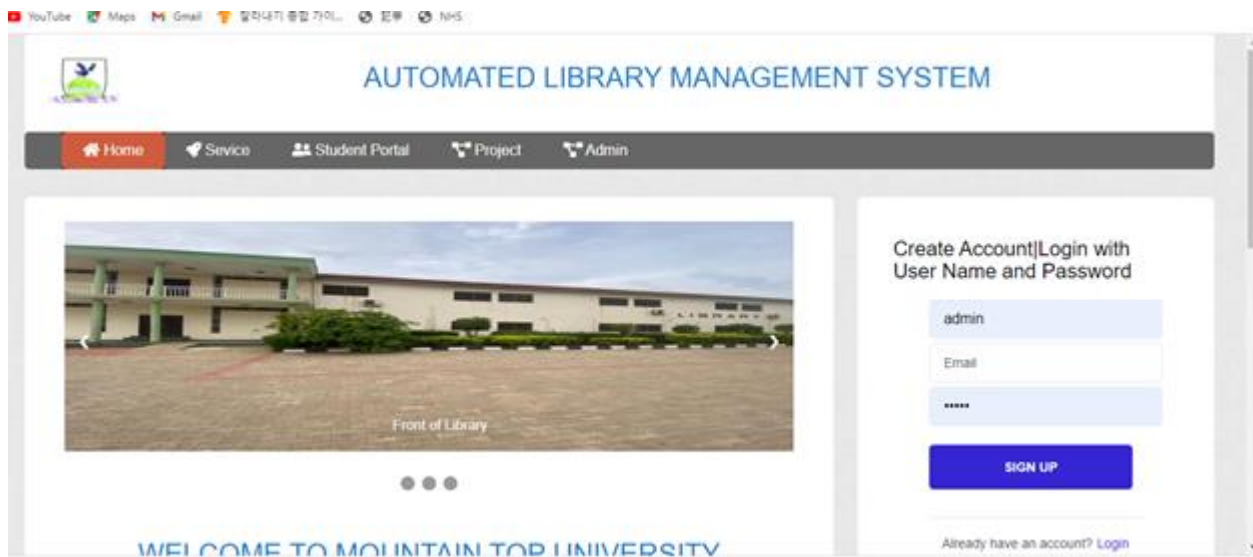


Figure 4 2 Home Page

Dashboard

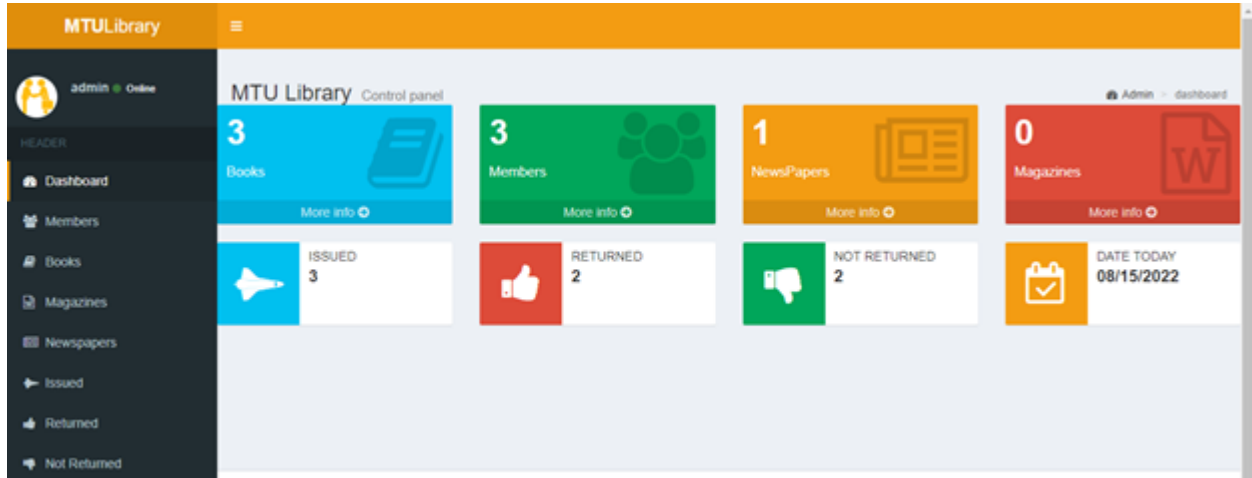


Figure 4 3 Dashboard

Member Page

The screenshot displays the MTU Library Control panel for the 'Users' section. The interface includes a sidebar with navigation options like Dashboard, Members, Books, Magazines, Newspapers, Issued, Returned, and Not Returned. The main content area shows a table of users with the following data:

<input type="checkbox"/>	Membership Number	Name	Contact	ID Number
<input type="checkbox"/>	1231	Kelvin Guma	0708344101	99239183
<input type="checkbox"/>	2000	Dennis Amadi	079822271	33432113
<input type="checkbox"/>	12345	Richard Orah	08067613144	908899

Records 1 to 3 of 3

Navigation buttons: Previous, Next

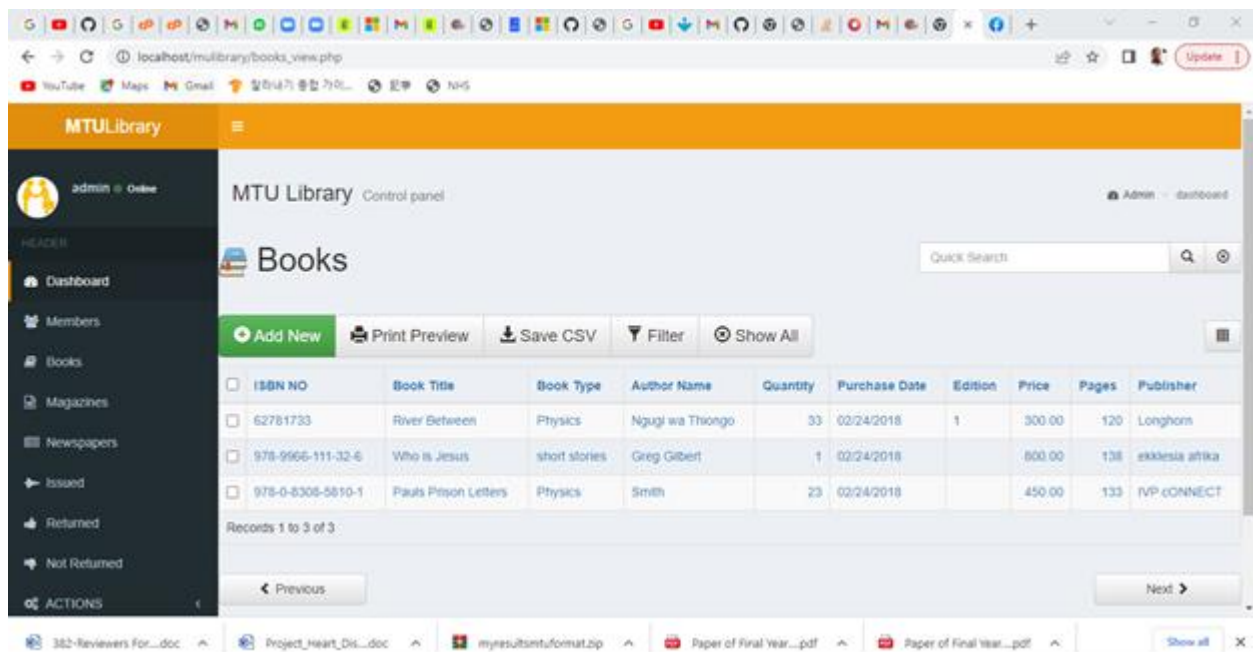
Actions: Add New, Print Preview, Save CSV, Filter, Show All

Search: Quick Search

Footer: 382-Reviewers For...doc, Project_Heart_Dis...doc, myresultsmtuformat.zip, Paper of Final Year...pdf, Paper of Final Year...pdf, Show all

Figure 4 4 Member Page

Book Registration



The screenshot displays the MTU Library Control Panel interface. The page title is "MTU Library Control panel" and the user is logged in as "admin". The main section is titled "Books" and includes a search bar and several action buttons: "Add New", "Print Preview", "Save CSV", "Filter", and "Show All". Below these buttons is a table listing three books with their respective details.

<input type="checkbox"/>	ISBN NO	Book Title	Book Type	Author Name	Quantity	Purchase Date	Edition	Price	Pages	Publisher
<input type="checkbox"/>	62781733	River Between	Physics	Ngugi wa Thiongo	33	02/24/2018	1	300.00	120	Longhorn
<input type="checkbox"/>	978-9966-111-32-6	Who is Jesus	short stories	Greg Gilbert	1	02/24/2018		600.00	138	eklesia africa
<input type="checkbox"/>	978-0-8308-5810-1	Pauls Prison Letters	Physics	Smith	23	02/24/2018		450.00	133	IVP cONNECT

Records 1 to 3 of 3

Navigation buttons: Previous, Next

Figure 4 5 Book Registration

Issued Book Module

The screenshot shows a web browser displaying the MTU Library Issued Book Module. The interface includes a sidebar with navigation options like Dashboard, Members, Books, Magazines, Newspapers, Issued, Returned, and Not Returned. The main content area shows a table of issued books with columns for Issue ID, Member, Number, Book Number, Book Title, Issue Date, Return Date, and Status. The table contains three records. Below the table, there are navigation buttons for 'Previous' and 'Next', and a status indicator 'Records 1 to 3 of 3'. The browser's address bar shows the URL 'localhost/mulibrary/Book_issue_view.php'.

Issue ID	Member	Number	Book Number	Book Title	Issue Date	Return Date	Status
1	Kelvin Guma	1231	62781733	River Between	02/24/2018	02/24/2018	returned
2	Dennis Amadi	2000	978-9966-111-32-6	Who is Jesus	02/24/2018	03/01/2018	issued
3	Richard Oran	12345	62781733	River Between	07/16/2022	07/20/2022	issued

Figure 4 6 Issued Book Module

Returned Page Module

The screenshot shows the MTU Library web application interface. The page title is "Returned". The table below contains the following data:

Book Number	Book Title	Issue Date	Due Date	Return Date	Member	Number	Fine	Status
<input type="checkbox"/> 62781733	River Between	02/24/2018	02/24/2018	03/04/2018	Kelvin Guma	1231	50.00	cleared
<input type="checkbox"/> 62781733	River Between	07/16/2022	07/20/2022	07/16/2022	Richard Craft	12345	500.00	pending

Records 1 to 2 of 2

Figure 4 7 Returned Page Module

Fine Module

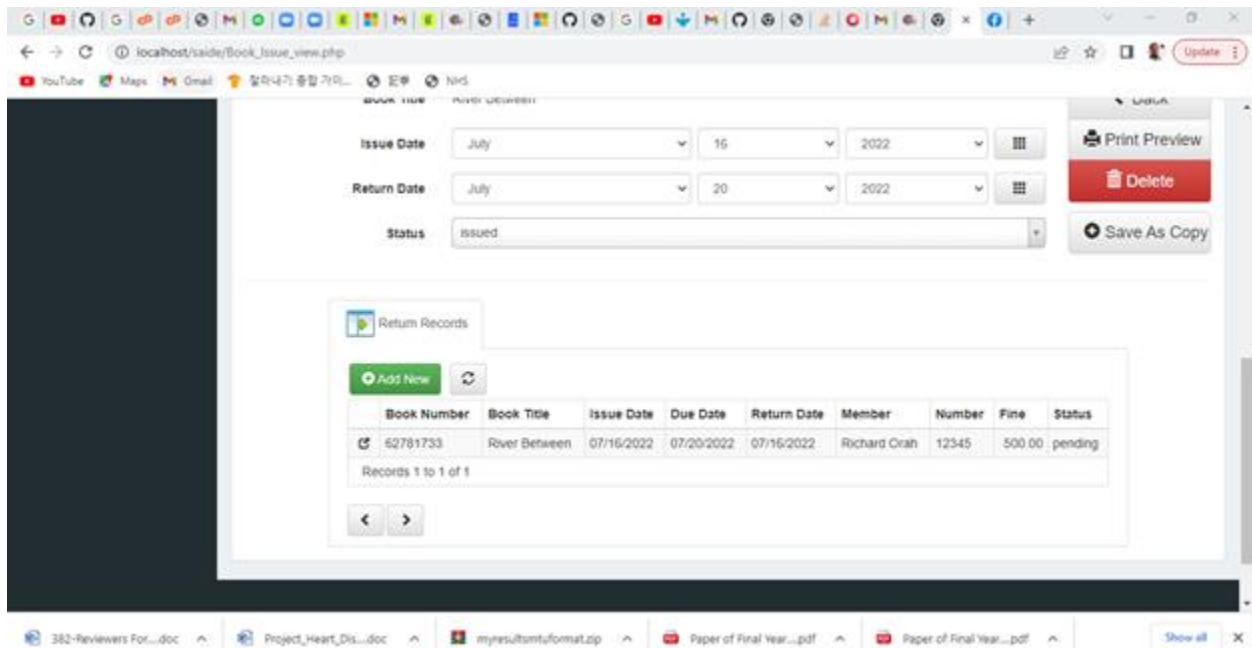


Figure 4 8 Fine Module

CHAPTER FIVE

5.0 INTRODUCTION

This chapter includes a full explanation of the overview of the web application for library management, recommendations for more research on this topic, and a conclusion that summarizes the expected features of a better library management system.

5.1 SUMMARY

The desire to make life simpler and processes faster has resulted in the computerization of several processes. Computer technology has had a significant impact on several areas, including education. A Library Management System has been designed to handle all library activities such as borrowing and returning books to boost technology-driven education.

The current system was investigated and analyzed, and the faults related to the old technique of accessing electronic resources were uncovered. The new system was developed. It addressed the issues discovered throughout the investigation.

The project was divided into five chapters, which are as follows:

An overview of the project is provided in the introduction. A literature review exposes the author to a wide range of similar materials and research conducted by others. For the app to fulfill its stated aim, the tools that were helpful in the system design and development of the fundamental idea and functionality. The design and execution of the new system that produced the outcomes. The project concluded with a conclusion and recommendations, as well as some references.

5.2 CONCLUSION

In conclusion, from proper analysis and assessment of the designed system, it can be safely concluded that the system is an efficient, usable, and reliable Library Management System. It is working properly and adequately meets the minimum expectations that were for it initially. The new system is expected to give benefits to the users and staff in terms of efficiency in the usage of the library system.

It was found out that the manual Library system usually has weaknesses including time wastage and space, and it is hard to locate library resources. It was also identified that a Library system requires the recording of books, checking for availability of books in the library, and also easily finding out those who have not returned the borrowed books. Therefore, if embraced and taken seriously, a lot of benefits therein will be realized by the users and the above problems will be no more

5.3 RECOMMENDATIONS

I encourage tertiary institutions, in particular Mountain Top University, to fully implement this system as it will not only increase the effectiveness of our library services but also positively impact the institution's corporate image and the caliber of books that are available to students, positioning the university in a leading position in Nigeria. Additionally, I advise the MTU library to make sure that books are just as readily available in electronic format as they are in physical copies.

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