

Abstract

Library Management System is a system which maintains the records of books present in the library. It is difficult to keep the records of all the books and it is very time consuming. Due to the advancement in the technology online library management system has become much simple and easier. As online library management system is a computerized system in which we can keep the records of books present in the library. To do this project, I have researched on internet and collected a lot of information about the project.

This project has features like user login and register for student and admin. In this system admin can monitor the whole system. After logging in the system students can see the list of books issued and its issued and returned date. They can also search and request for the book by filling the book request form then admin will add the book as per the request of student. After logging in the system admin can search the information of books and students. They can also add delete and update the information and record of books. This project is developed to help the students and librarian to maintain the library and to reduce human effort.

Keyword: library, book, book issue, book return

Acknowledgement

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List of Abbreviations

Table 1: List of Abbreviation

Abbreviations	Full Form
AJAX	Asynchronous JavaScript And XML
CRUD	Create Read Update Delete
CSS	Cascading Style Sheets
DBMS	Database Management System
DFD	Data Flow Diagram
ER DIAGRAM	Entity Relation Diagram
HTML	Hyper Text Markup Language
JS	JavaScript
PHP	Hypertext Preprocessor
SQL	Structured Query Language
TU	Tribhuvan University
UI	User Interface
XAMPP	Cross-platform Apache MySQL PHP and Perl

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Chapter 1: Introduction

1.1 Introduction

Library is a place where all kinds of books are stored and maintained. In library there is a huge collection of books. It contains books of various subjects including history, geography, fiction, health, science and literature. Library is also known as the treasure house of knowledge because people can gain knowledge of various subject matters which will increase their thinking capacity. Library plays an important role in all schools and colleges and helps the librarian to keep records of available and issued books.

Online library management system is a computerized system which helps user to manage the library daily activity in electronic format. Library management system is an automatic system that reduces the work burden of the librarian through a single click. The main objective of the Library Management system is organizing and managing the library tasks in the systematic manner. It is a web based System so it required only a registered user to access system by login. This library management system provides separate interface and login for librarian/admin, students. Library Management system is developed to keep the records of new books and details of book available in the library. This system contains list of all the books information and records. Using this system admin can issue book of the library member, maintain their records, and can checks how many book are issued and how many books are available in the library. Librarian is a person who can also modify database. Admin can also check the record of book issued date which is borrowed by the library member and if the date of issued book is returned after the due date then admin can make library member to pay fine as a penalty for late returning book.

Library management system have features of searching which makes easier for the users to search for the books by the name of the book according to the their requirement and can also request for the book. In the proposed system, students have to login and register to see the information of book then they can issued their book and get the required book according to their requirement. They can recommend for new books by just sending request to the librarian from any where in the college. Whenever library member wish to take a book, the book issued by the library authority will be check both the book details as

well as the student details and store it in library database. They can view the issue and return dates of any book.

1.2 Problem Statement

Before the online system was implemented, there was a system of recording files in the form of papers and chunks of file (documents). Due to which there was a problem of file lost, file damage, difficult to search records, space and time consuming. There was a problem of file loss due to human errors and also a problem of file damage due to accidental errors of humans and natural disaster. The records were large in number so there was difficulty in searching of records and large space was occupied by the books and files. As the records were written by human themselves so it was time consuming and large number of paper were used so it cost consuming.



Figure 1.2: Problem_Solution Statement 1



Figure 1.2: Problem_Solution Statement 2

Solutions

As my system is computerized system all the records were recorded in the computer so, there will be no loss of book record or member record. It reduces the risk of paper work such as file lost, file damage and time consuming. As the records are stored in the

computer it will be easy for user and admin to search the book and get the information of students within seconds. The admin can also add update and delete the information or records of books as per their requirement. Wherever the data of library records is needed it can be access from anywhere due to online system. Data security is available in library system due to login system and authenticate persons can access into the system. It reduces human effort and saves time.



Figure 1.2: Problem_Solution Statement 3

1.3 Objectives

The main objective of Library management system is to make the library and books systematic

- To handle the entire activity of the library
- To keep the record of books available in library
- To make the request column for users for providing new books
- To keep the record of issued and return book along with date
- To make good relationship between the students and librarian

Academic Objective

- To manage the available books in systematic manner
- To use the library resources
- To have the information about book requirement
- To provide user friendly environment for the user
- To provide books for students and to save time

Technical Objective

- To gain knowledge of buying the domain and hosting on the internet.
- To write the code on our own and implement practically.
- To be used to with electronic devices and internet
- To gain knowledge of the website how it works
- To gain knowledge of different programming languages

Personal Objective

- To gain real-life experience on IT related work
- To implement it practically after the completion of the project
- To create theoretical project into practical project
- To complete project before deadline

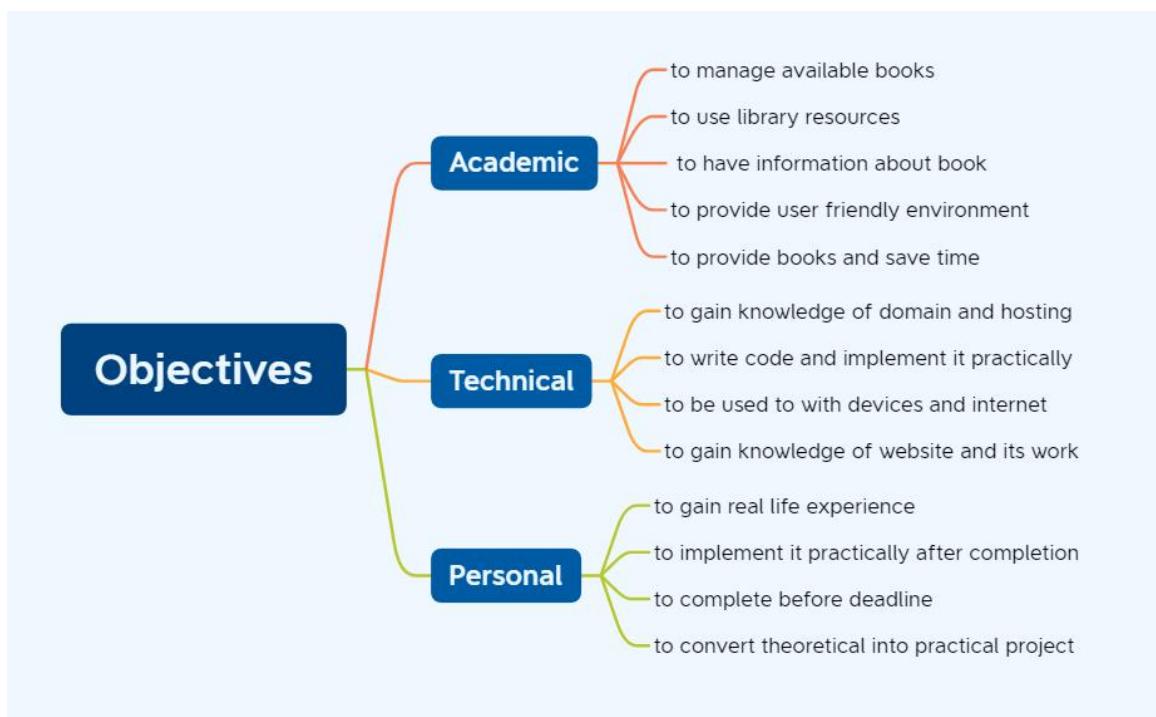


Figure 1.3: Objectives

1.4 Scope and Limitation

The scope of online library management system is to provide information of various kinds of books and many other facilities to the users. This system is a online system so it provides online platform to the user, which can be accessed easily through internet and can easily view all the latest updates of books and records related to library. This system provides a list of various book information that are available in the library. It provides the records and information of books as well as the of student. It provides the request column for the users in which they can request the book as per their requirement and needs. It provides the list of books that the user can borrow, and provides a status page for all the users where they can view the borrowed books along with the issued date and returned date. If the user cannot returned the book on time then they have to pay fine as a penalty. This system provides login facilities to the user due to which they can view and search book as their need.

The main limitation of online library management system is that it is a online platform so the automation feature isn't available in offline. There will have risk of computer virus and the security. This system is online system so it requires high speed internet connectivity. As the librarian has an authority to update so they have to check the website regularly.

1.5 Report Organization

The pages from certificate page is to be numbered in roman from page number 1. The page number should be inserted at the bottom, aligned center. The paper size corresponds to A4. The margin must be set as Top = 1, Bottom = 1; Right = 1; Left = 1.25. All paragraphs must be justified and have a spacing of 1.5 and the content of the document should be in Times New Roman Font. The font size in the paragraph is 12. Font size for the headings is 16, 14 is for section heading, 12 is for the sub-section heading. All the headings are bold faced. The position of figures and tables should be aligned center. The figure caption should be centered below the figure and table captions should be centered above the table. All the captions should be of bold face with 12 font size.

For library management project, there's Five chapters which have different in chapter one there is an introduction and background related to electronic to the project where problem statements, objective, scope, and limitation are mentioned. In chapter two there

is background study and literature review mentioned. In chapter three there is system analysis and design where requirement analysis, feasibility analysis, ER diagram and processing modeling is shown. In chapter four there is implementation and testing is discussed. In the implementation used tools case like CASE, Programming languages, Database is shown. In the testing Unit testing and system testing is shown. Last chapter 5 there is a conclusion and Future Recommendations is there. Where there is lesson learn and outcome with conclusion and future recommendations is there.

Chapter 2: Background Study and Literature Review

2.1 Background Study

The history of libraries began with the ever first efforts to organize collections of documents. The first libraries consisted of archives of the earliest form of writing – the clay tablets in cuneiform script discovered in temple rooms in Sumer, some dating back to 2600 BC. Persia at the time of the Achaemenid Empire (550–330 BC) was home to some outstanding libraries that were serving two main functions: keeping the records of administrative documents. The Library of Alexandria, in Egypt, was the largest and most significant great library of the ancient world. At this time the library catalog was written on scrolls of fine silk and stored in silk bags. Important new technological innovations include the use of paper and block printing. ; In the 5th century, the Imperial Library of Constantinople had 120,000 volumes and was the largest library in Europe. During this period, small private libraries existed. Many of these were owned by church members and the aristocracy. By the 8th century China's art of paper making was acquired by Iranians and then developed across the whole Muslim world. From the art, Muslims developed paper making into an industry. As a result of this technical enhancement, the books were more easily manufactured and they were more broadly accessible. The 17th and 18th centuries include what is known as a golden age of libraries; during this some of the more important libraries were founded in Europe.[\[1\]](#)

This era is termed the "golden age of libraries", as libraries became national symbols of pride. One of the first plans for a national library was the preservation of old books, manuscripts and records and the founding of a national library, but his proposal was not taken up. The first true national library was founded in 1753 as part of the British Museum. The first exhibition galleries and reading room for scholars opened on 15 January 1759. In the 20th century, many public libraries were built in different Modernist architecture styles, some more functional, others more representative.[\[24\]](#)

In the 21st Century, libraries continue to change and evolve to match new trends involving the way that patrons consume books and other media. More than ever, the 21st Century library is the digital library. By 2017, 100% of US libraries offered internet access and 90% helped with internet skills. Librarians became increasingly responsible for both physical and digital collections. With an increase in demand for digital resources, library systems throughout the world have expanded their outreach. Driven by ebook reading apps that categorize content based on different popular groupings,

digital book clubs, digital magazines, and easy-access digital library cards for ebooks and audiobooks ebook and audiobook use in libraries globally reached a record high with 326 million loans by the end of 2018.[\[25\]](#)

In ancient time Nepal was the center of education. The Hindi temples, Baudha Gumbas were the places of education. Those holy places also used to collect the manuscripts in various forms such as tamrapatra, shilapatra etc. Lichhavi dynasty is called the golden age of Nepal. The written history started from this period. Library history was began from the Kathmandu Valley. It is said that there was a library called “SAKOTHA” in Bhaktapur in Malla Dynasty. During unification of Nepal Prithivi Narayan Shah started to collect valuable manuscripts and written documents and kept to Hanumandhoka palace. King Girvanayuddhavikram shaha ordered to open a Library “Pustak Chitahi Tahabil” in his palace (1869 Bhadra 15). It was the first library in Nepal. This is the first written law to establish the Library in Nepal. A librarian and two assistants were appointed to look after the library. Nepal is celebrating the Library day in the memory of the historical day every year since 2008. It lies on August 31st of September 1st according to English calendar. Tri-Chandra College was the first Higher education institute and there was a library too, to help the teaching learning activities.[\[26\]](#)

A public library was opened in the name of “Pustak padhne Dalan” in 1929 in Palpa. It was renamed as “Dhawal Librar”y in 1947. There were only 31 libraries in Nepal before the independence many of them were as personal library but after the independence many educational institutes were started throughout the country. Central library was established in 1952 in cooperation with the USAID. Current renowned libraries such as Nepal National Library, Madan puraskar were established in 1957. There are nine university and four deemed university in Nepal. 97 constituent, 1268 affiliated colleges under these universities. Each university has their own Central Library. There are 38 central departments, 60 constituent, 1053 affiliated colleges and four research centres under tribhuvan university. Each college has their own libraries. Tribhuvan university Library was established in 1959. The central Library and the Tribhuvan University Library were merged as Tribhuvan University Central Library(TUCL)in 1961.[\[25\]](#)

E-library is taken as a relatively safer means of saving reading material as it is used in a digital form and has no risk of books getting misplaced and lost as hardcopies. The E-pati that launched the practice of e-library eight years back in 2066 BS has so far transformed around eight thousand books useful for Public Service Commission and other books

written by individuals, 12 thousand books related to health and education and some other four thousand books into electronic form and stored in its library.[\[27\]](#)

With the time changes need of the user changes. To meet their requirements different types of libraries were set up. We can see that how the user of earlier time get their information and knowledge. As the time changes libraries were set up according to the need of different types of users. When we compare ancient libraries with the today modern libraries we can see a vast change. Now the user not to wait a lot for its information. They can get the information at their working place from internet accessing.[\[26\]](#)

2.2 Literature Review

1. Sasthri Ganeshan(2015) has mentioned that after the advancement in technology new system is always added. Library management system is a virtual library where people can read book and borrow book virtually so that there time and effort is saved. Before student and teacher has to search book in library which is hassle but management system has made it easy just a simple click can find the book in a micro second. The overall progress of work is slow and it is impossible to generate a fast report. The librarians have to work allotted for arranging, sorting books in the book sells. At the same time, they have to check and monitor the lend/borrow book details with its fine. It is a tedious process to work simultaneously in different sectors. LMS will assist the librarians to work easily. The LMS supports the librarians to encounter all the issues concurrently. The users need not stand in a queue for a long period to return/borrow a book from the library. The single PC contains all the data's in it. The librarians have to assess the system and provide an entry in it. Through LMS the librarian can find the book in the bookshelves. The LMS is designed with the basic features such as librarian can add/view/update/delete books and students' details in it. Once he/she ingress into the system they can modify any data's in the database. The complete model is developed in Dot net technology, the C# language is used to build the front end application whereas the SQL server is exploiting as database. The authorized person can only access the LMS system, they have to log in with their user id and password. As aforementioned that the LMS is designed in a user-friendly manner, so the admin can smoothly activate the system without expert advice. Every data is storing and retrieving from the SQL database so it is highly secure. This system contributes its new approach towards the digital library setup.[\[2\]](#)

2. Prasanna and Gupta (2020) analyzed in the Online Library Management using System JAVA technologies. This has various technical areas. It includes WINDOWS XP as the operating System, Oracle as Database. The front end deals with GUI and source code deals with Oracle (Backend). Library Management System provides knowledge and practical perspectives all aspects of management of libraries and information services, which will prove invaluable to managing a library or information services cost effectively, while meeting the needs of its users. Library Management System is one of the most tedious processes, which involves the regular updating of many files and records. As new members enroll for membership the management has to issue a unique membership code for that member. For this they have to keep a track of many records such as student details, book details and maintain a number of registers. Doing this manually involves a lot of time and labor. Hence this can be made easy through automation.[\[3\]](#)

3. Petal. (2020) analyzed in the paper Library Management System using Dot net technology, the C# language is used to build the front end application. Researcher revealed that The Library Management system (LMS) acts as a tool to transform traditional libraries into digital libraries. In traditional libraries, the students/user has to search for books which are hassle process and there is no proper maintenance of database about issues/fines. The overall progress of work is slow and it is impossible to generate a fast report. The librarians have to work allotted for arranging, sorting books in the book sells. At the same time, they have to check and monitor the lend/borrow book details with its fine. It is a tedious process to work simultaneously in different sectors. LMS will assist the librarians to work easily. The LMS supports the librarians to encounter all the issues concurrently.[\[4\]](#)

4. Kadir etal. (2020) analyzed in the paper ‘Library management system: impact of library environments’ by integrating with all departments within the library shows how LMS is important in library environment and this conceptual paper will focus on the impact that the LMS brings to the library environment. Research found that with the advancement of technology, library need to be ready for changes and bring the technology to the library in order to retain their customer’s interest in visiting the library. Thus, in this situation, library’s system should be improved as well to facilitate staff or librarian in doing their work effectively.[\[5\]](#)

5. Rifaudeen (2015) analyzed in the paper ‘Information Management in Libraries and Its Impact on Sustainable Library and Information Services with Special Reference to University Libraries of Sri Lanka’ by developing information management skills and sustainable library programs and activities such as resource sharing/ collaboration, create flexibility, reduce costs, social networking, distribution and marketing, strengthen ICT infrastructure to address the broader issues of a sustainable future for library resources and service provision to their patrons. Research found that Technological, Economic and Social changes have transformed the roles of libraries and information management in the recent past. These changes have a great impact on the existence and sustainability of the libraries. At the same time, it provides many opportunities and venues to manage the library and information services sustainably. The library professionals have to consider seriously these changing contexts and the new roles of the library and update and improve the information management and data computing skills. Hence, library professionals will improve the capabilities in order to lead the libraries towards the changing strategies to face the challenges brought by the digital age. Libraries face enormous challenges in managing information and have to tackles the challenges by managing the libraries effectively for tomorrow and transformation of the libraries to a sustainable future. Information Management skills play an important role in managing libraries and information services effectively and ensuring that the services continue to, the present and anticipated needs of patrons sustainably.[\[5\]](#)

Chapter 3: System Analysis and Design

Waterfall methodology is used in this project. It is very simple to understand and use. There are four phases in this project.[\[6\]](#) They are System analysis, System Design, Implementation and Testing which is shown in the figure below.

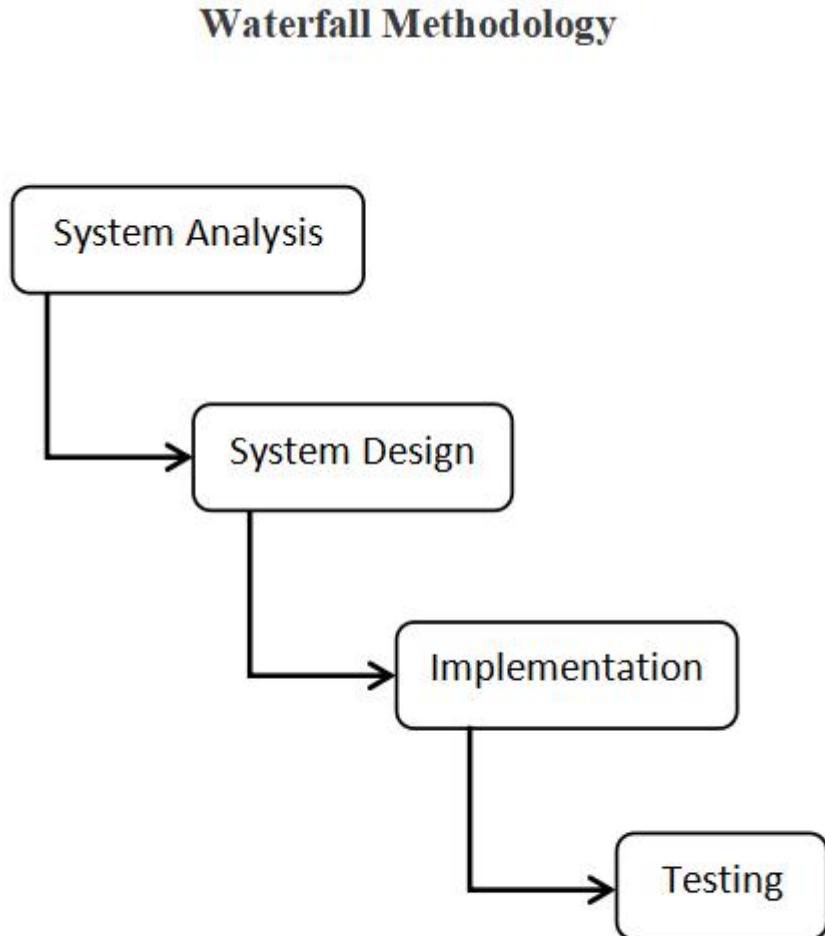


Figure 3: Waterfall Methodology

First phase of waterfall methodology is System analysis which contains four types i.e, requirement analysis, feasibility analysis, data modeling, process modeling. Requirement analysis has further divided into two part. They are functional and non functional requirement. Feasibility analysis also divided into four part. They are technical, operational, economic and schedule. Second phase is system design which have four design part which shows the project function in the form of figure. They are architectural design, database schema design, Interface design and physical DFD. Third phase is

implementation which show the tools that are used in the time of developing the project. It have two part that is tools used and implementation details of modules. Forth phase is testing which is done to check whether the project is working properly as per requirement or not. It also have two parts that is unit testing and system testing.

3.1 System Analysis

3.1.1 Requirement Analysis

i. Functional Requirements

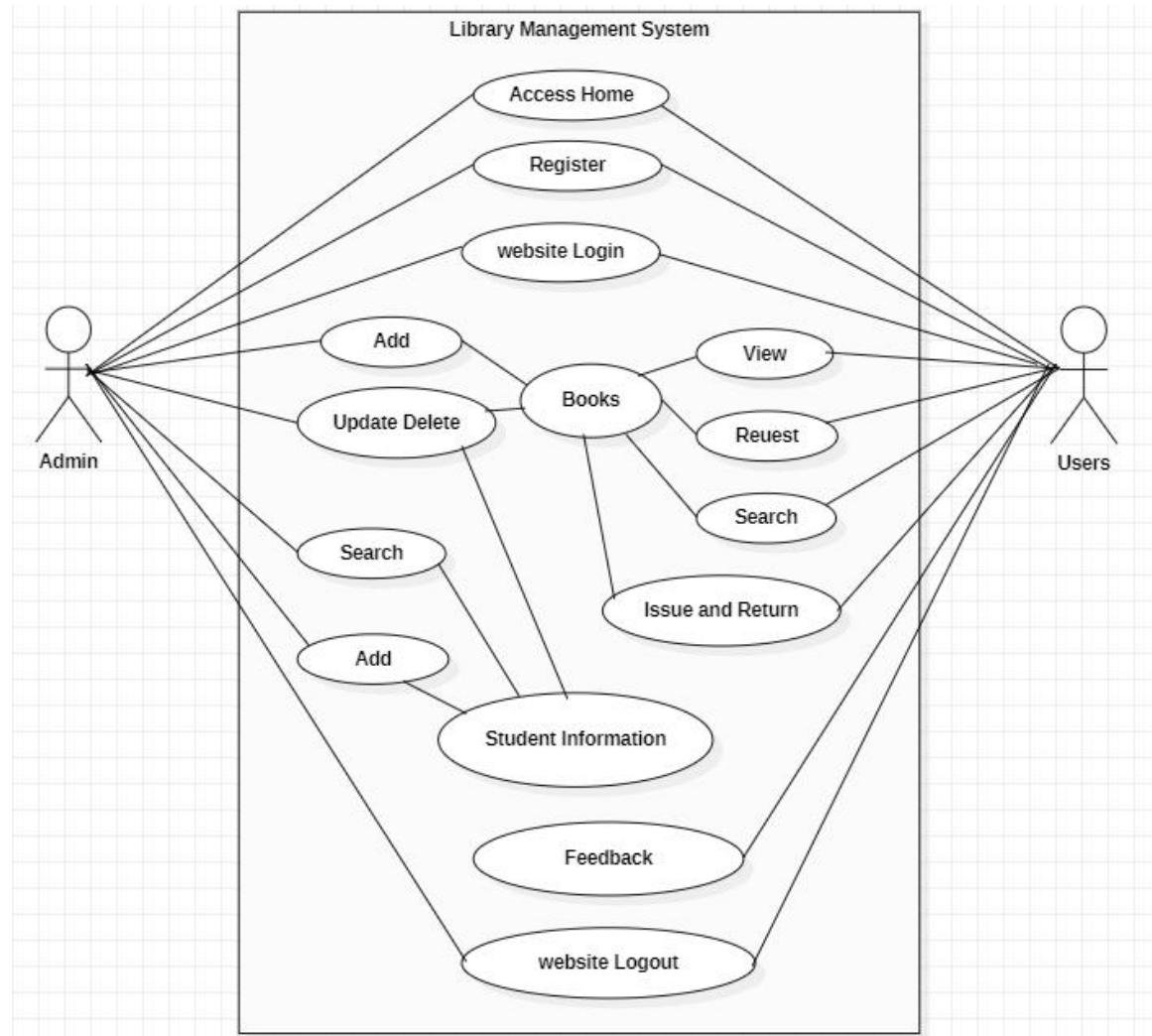


Figure 3.1.1: Use Case Diagram

The above-mentioned use case diagram shows the functionality of the library management system. In this diagram, the student/user and admin have to login and register first to access the system. After getting the authentication the user and both admin can use the system. After logging in the system students can see the list of books issued

and its issued and returned date. They can also search the book. Once the book has been found as their need the student can get it issued easily and if not found student can request for the book by filling the book request form then admin will add the book as per the request of student. After logging in the system admin can search the information of books and students. Admin can also add delete and update the information and record of books. The admin will monitor all the activities of the system. The admin has features like adding the information of books, adding new books as per the requirement and need of the student, updating the record and information if there is any mistake, deleting the record if it is not in use. If the student and admin wants to leave the system they can logout.

ii. Non Functional Requirements

Efficiency Requirement

This system makes the work easy for the the students and admin/Librarian . Through this system, the students can search the books and get it issued. It is not time consuming and librarian an handle it easily

Reliability Requirement

This system works with more accuracy like user registration, user validation, book search, issue and return operation.

Usability Requirement

The online library management system provides user-friendly environment to the users/student and admin/librarian. They can utilize the system in effective manner to make their work easy.

System Implementation Requirement

To develop this system HTML and CSS has been used. PHP is a easy and efficient for database connectivity so it is used. MySQL has also been used for backened part in case of any data loss.

3.1.2 Feasibility Analysis

i. Technical

This system is web based simple software. It is easy to use and understand. It does not need any vast knowledge and training to use this system. All the function of this system can be implemented in the new system easily.

ii. Operational

This system is completely operational and can be successfully implemented. College library management system is easy to understand. It provides simple environment in which user can feel free to work faster, easier, and more accurate. It is user-friendly for the users and also checks backup date in case of loss.

iii. Economic

The economical feasibility contains the documentation regarding the cost and benefits of new proposed computerized system. College library management system is a worth making project. In this we check how economically feasible is the project and check how we can make profit through this project.

iv. Schedule

Through this, timeline is develop for the project. It makes easier to see the tasks with given time period and also shows how long will it take to complete the task. It also shows who should be working on it and what ordered work should be done in it. The following Gantt Chart shows the timeline of the project.

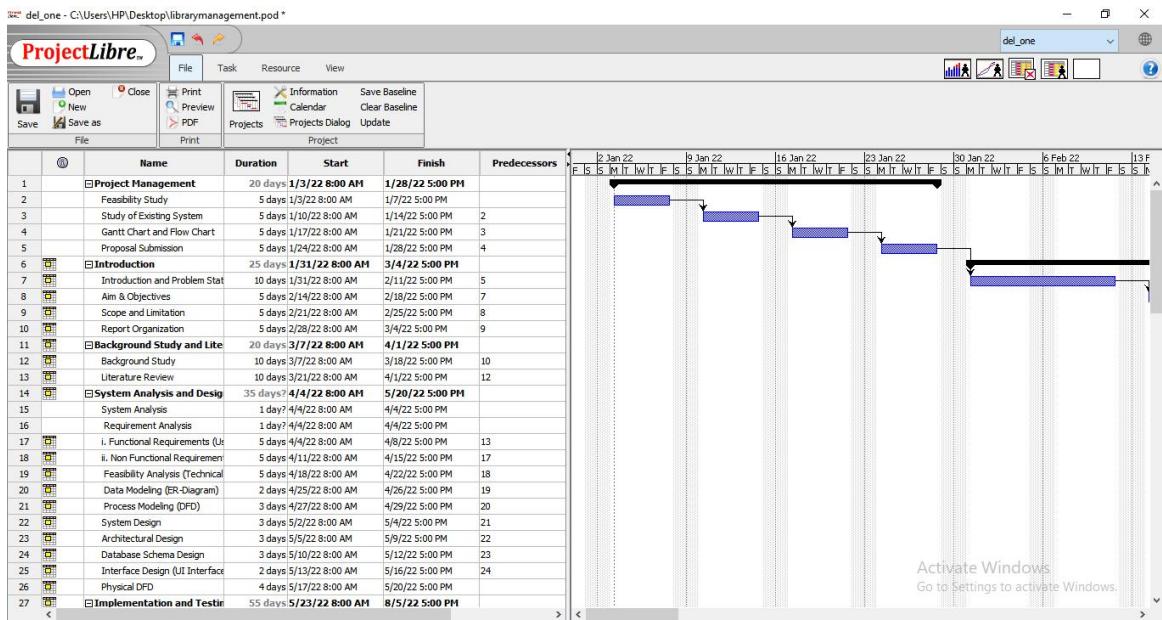


Figure 3.1.2: Gantt-chart 1

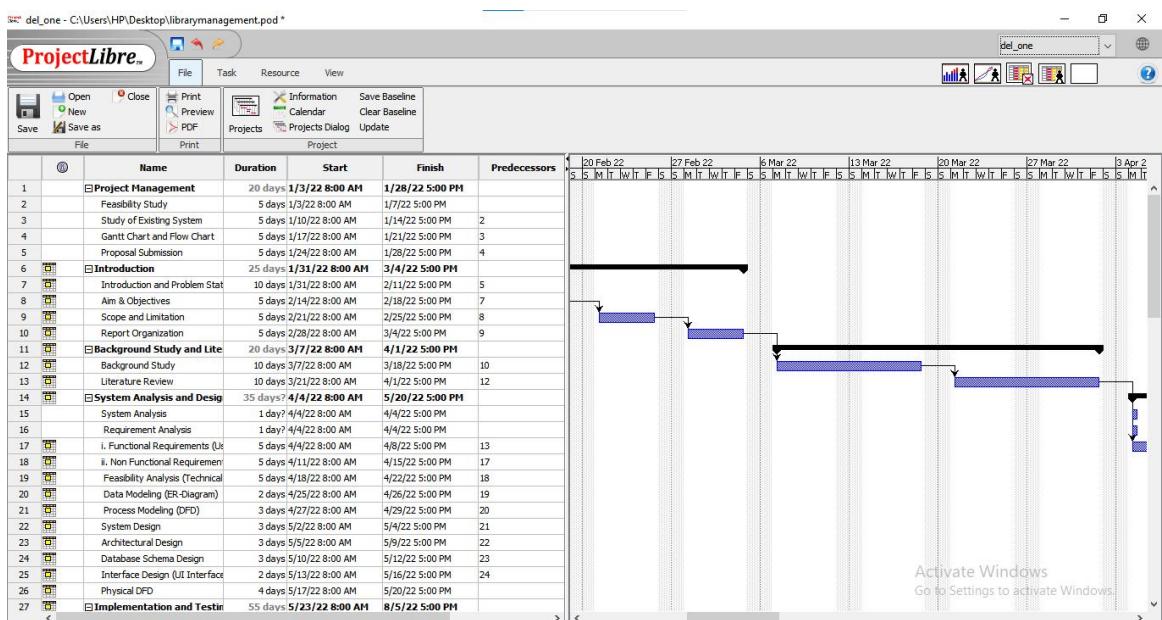


Figure 3.1.2: Gantt-chart 2

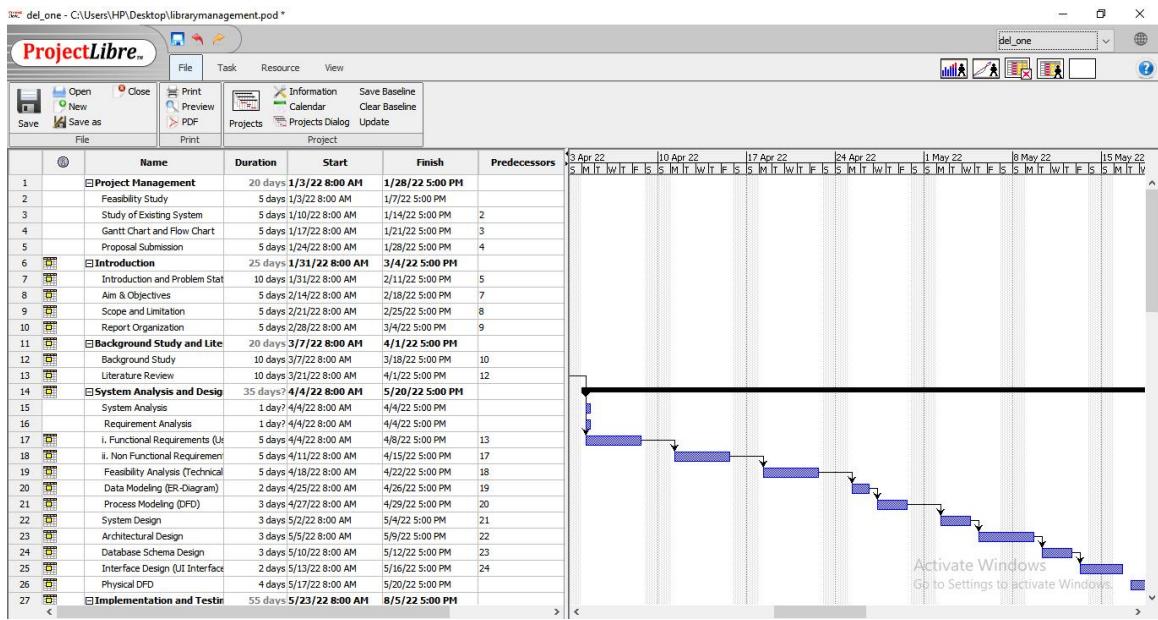


Figure 3.1.2: Gantt-chart 3

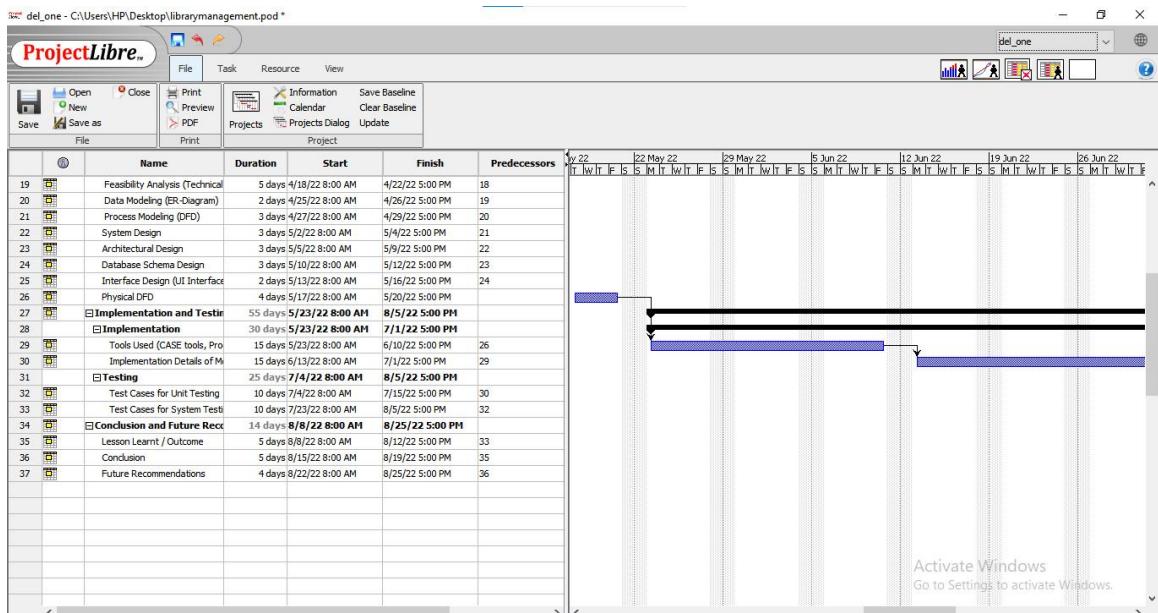


Figure 3.1.2: Gantt-chart 4

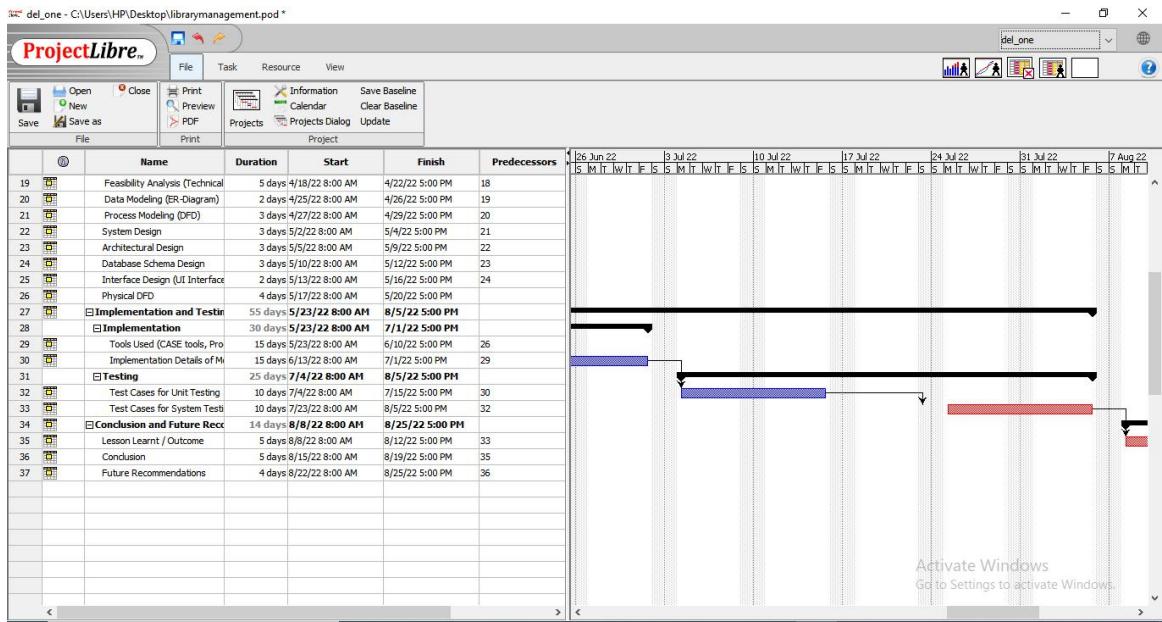


Figure 3.1.2: Gantt-chart 5

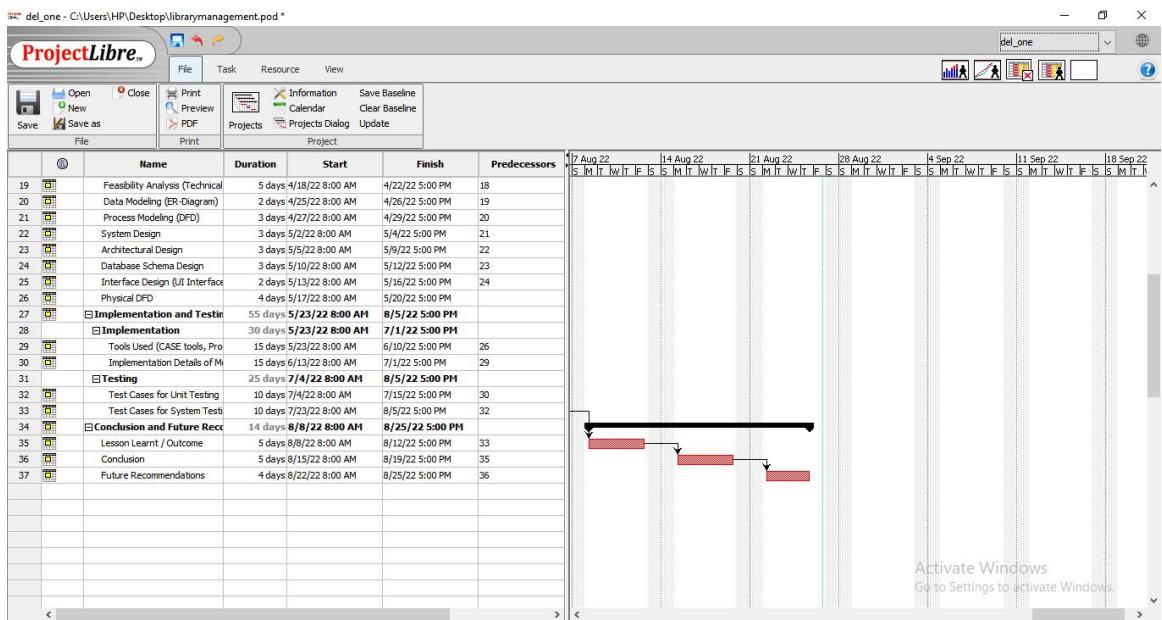


Figure 3.1.2: Gantt-chart 6

3.1.3 Data Modeling (ER-Diagram)

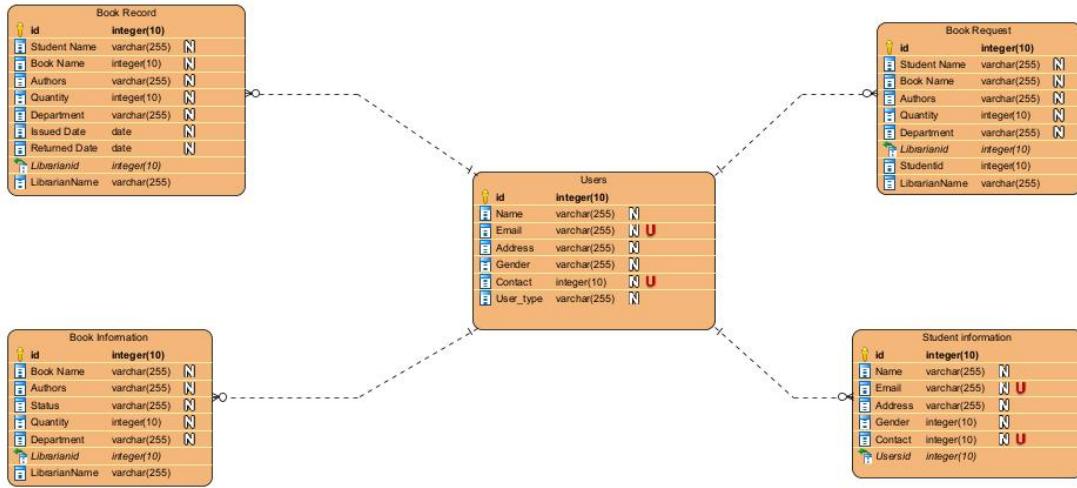


Figure 3.1.3: ER-Diagram

3.1.4 Process Modeling (DFD)

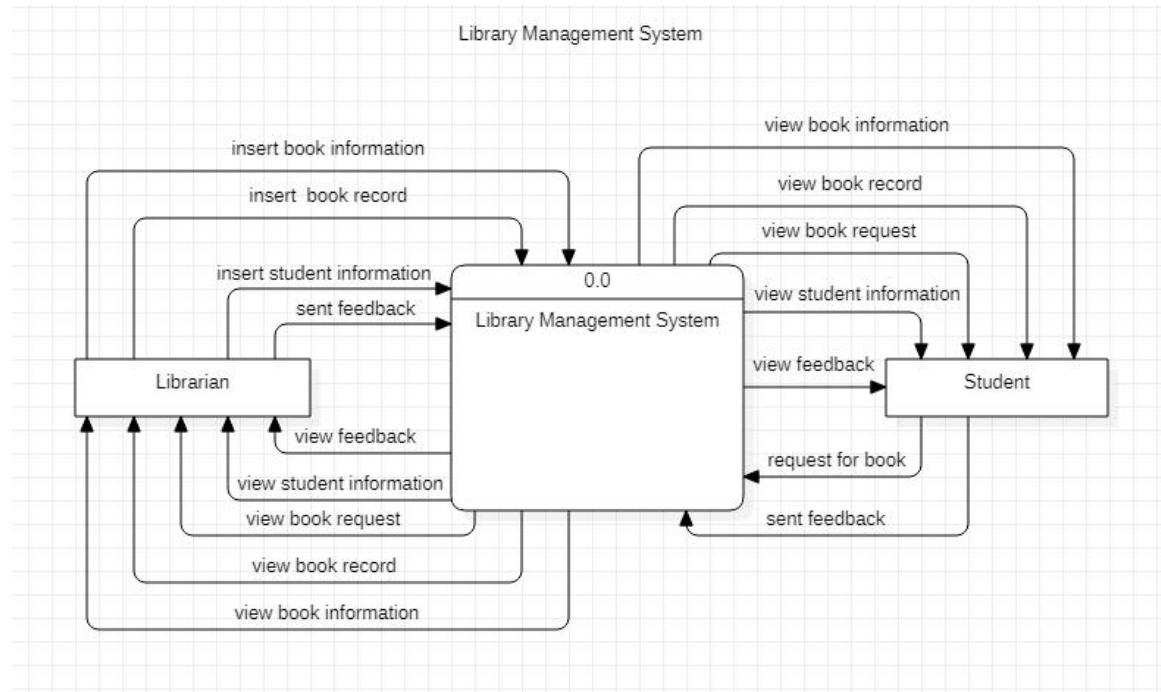


Figure 3.1.4: DFD level 0

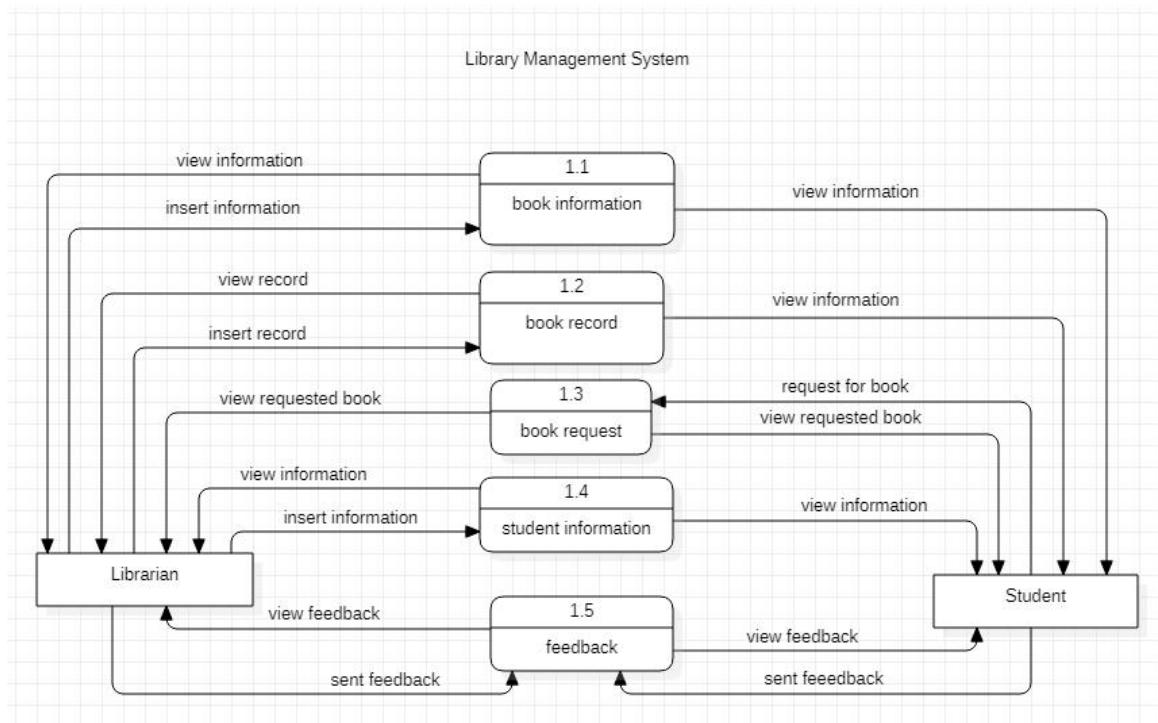


Figure 3.1.4: DFD level 1

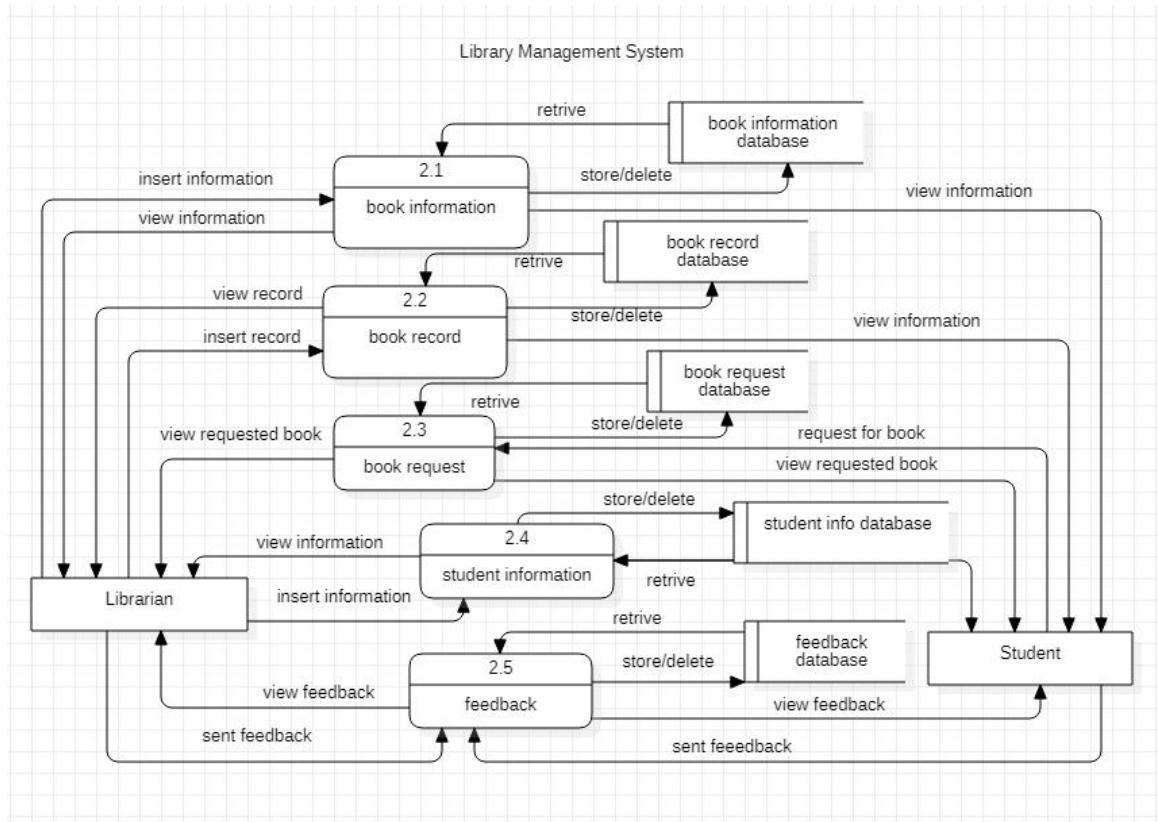


Figure 3.1.4: DFD level 2

3.2 System Design

3.2.1 Architectural Design

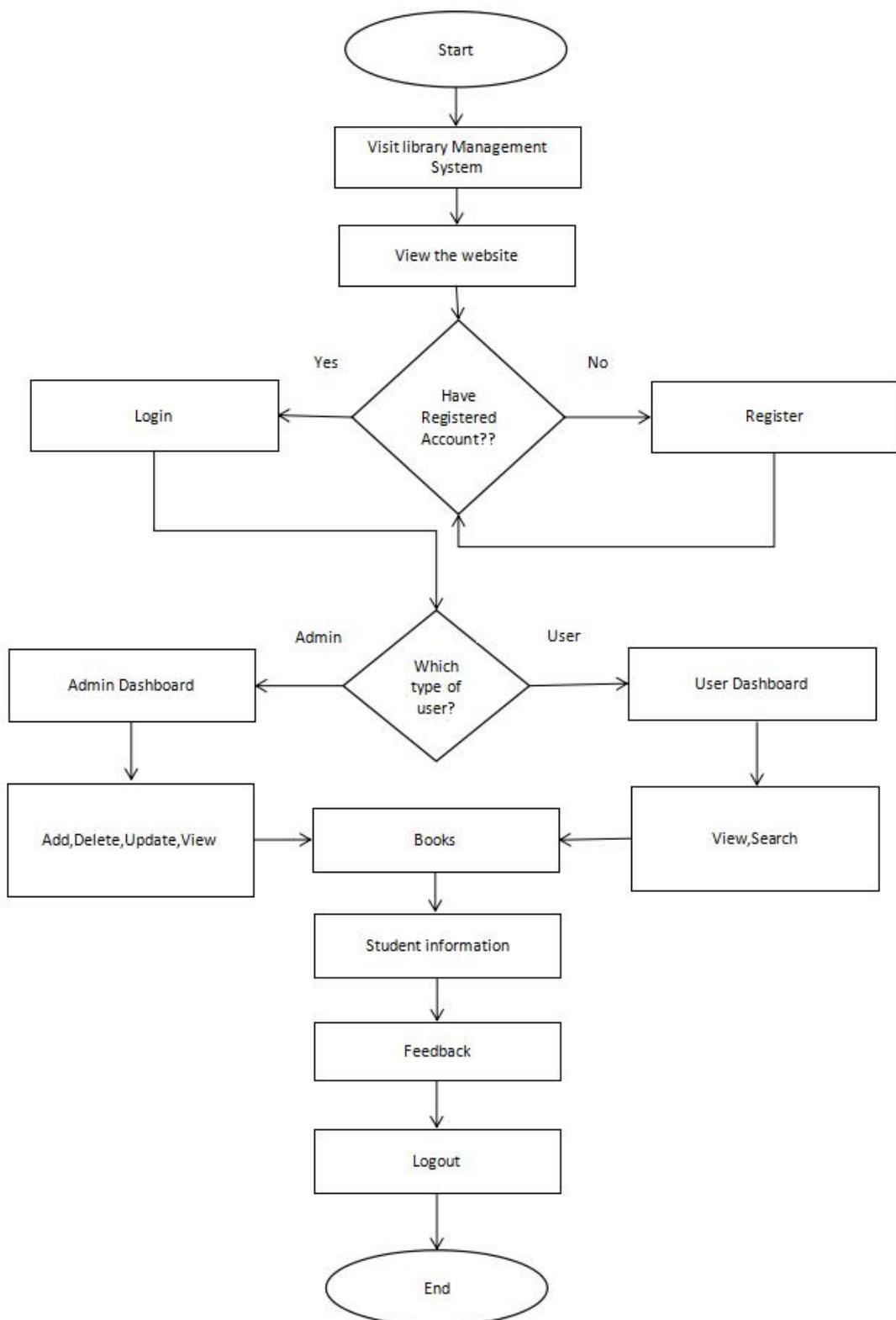


Figure 3.2.1: Flowchart

3.2.2 Database Schema Design

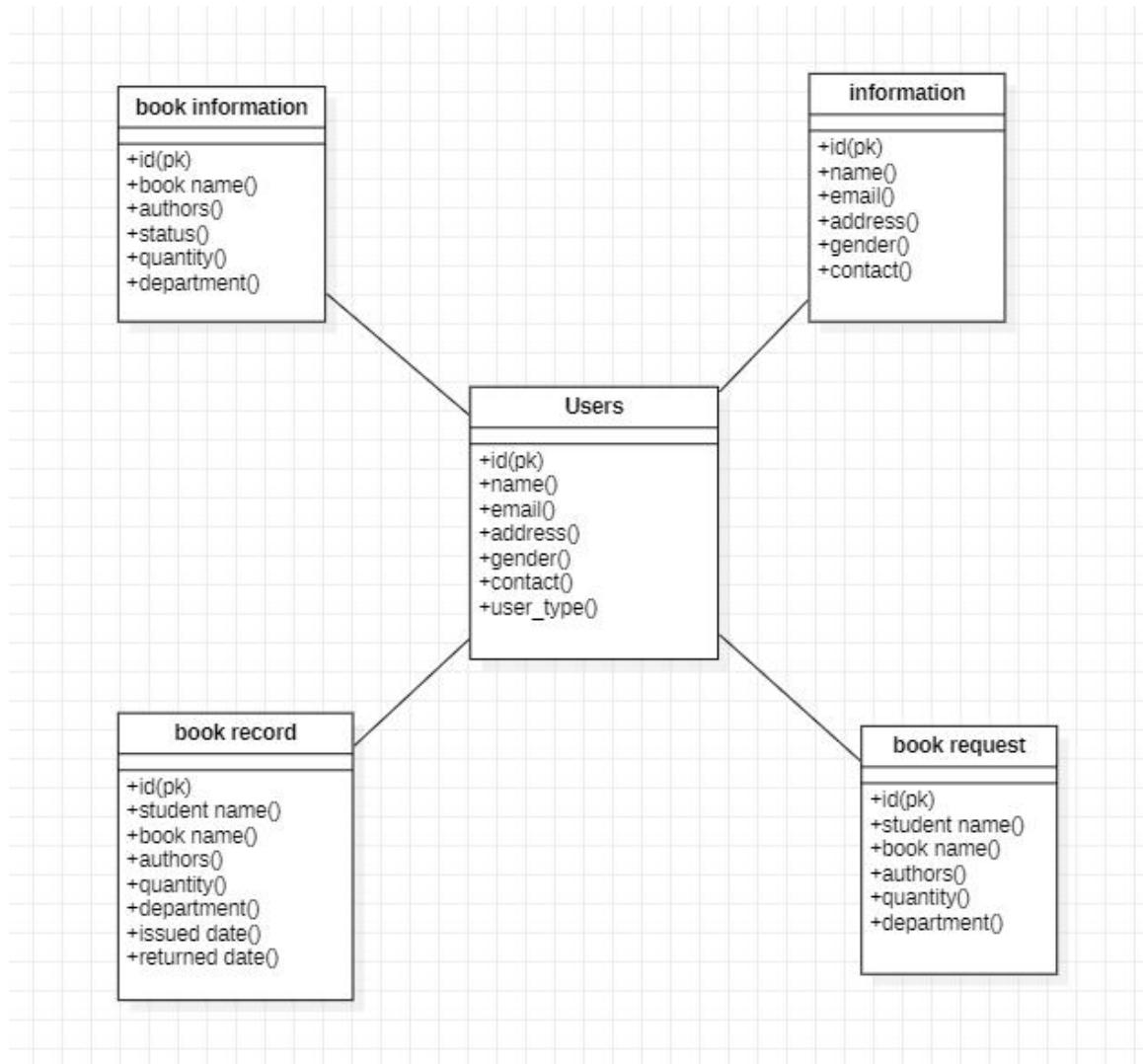


Figure 3.2.2: Database Schema

3.2.3 Interface Design (UI Interface / Interface Structure Diagrams)

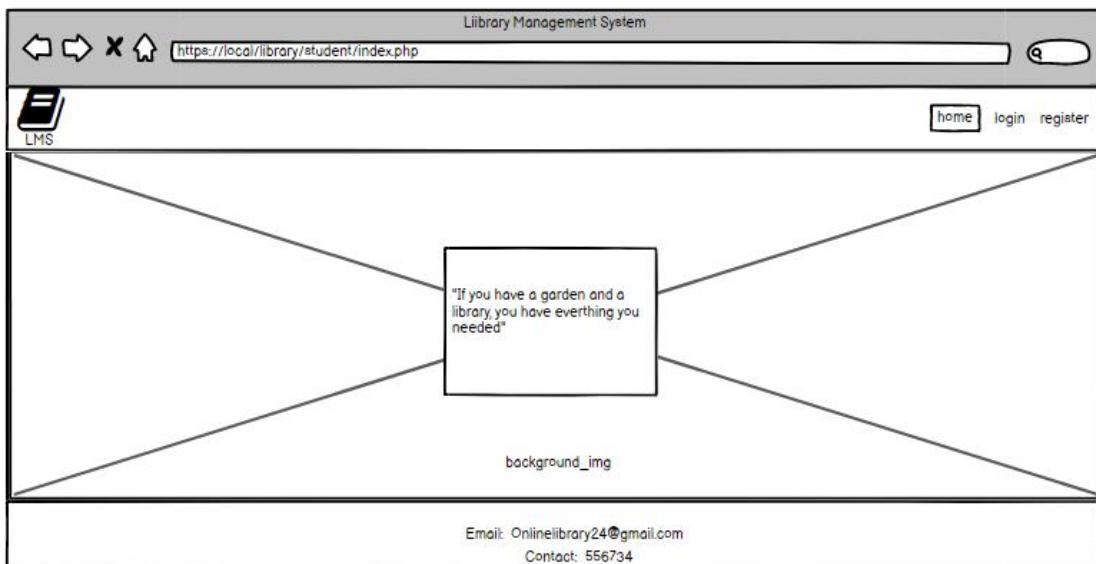


Figure 3.2.3: Index page UI

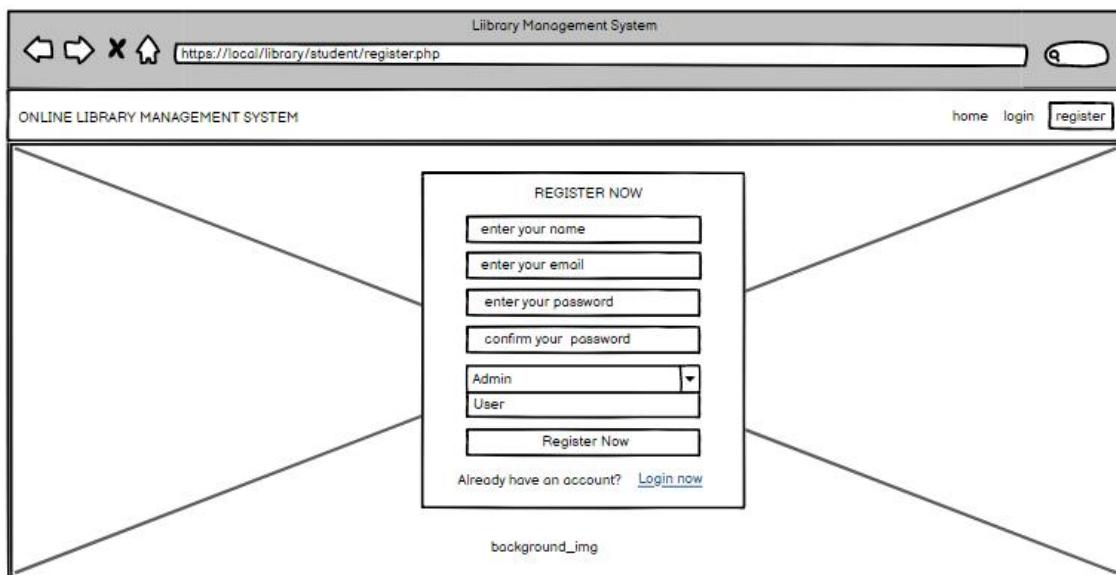


Figure 3.2.3: Register page

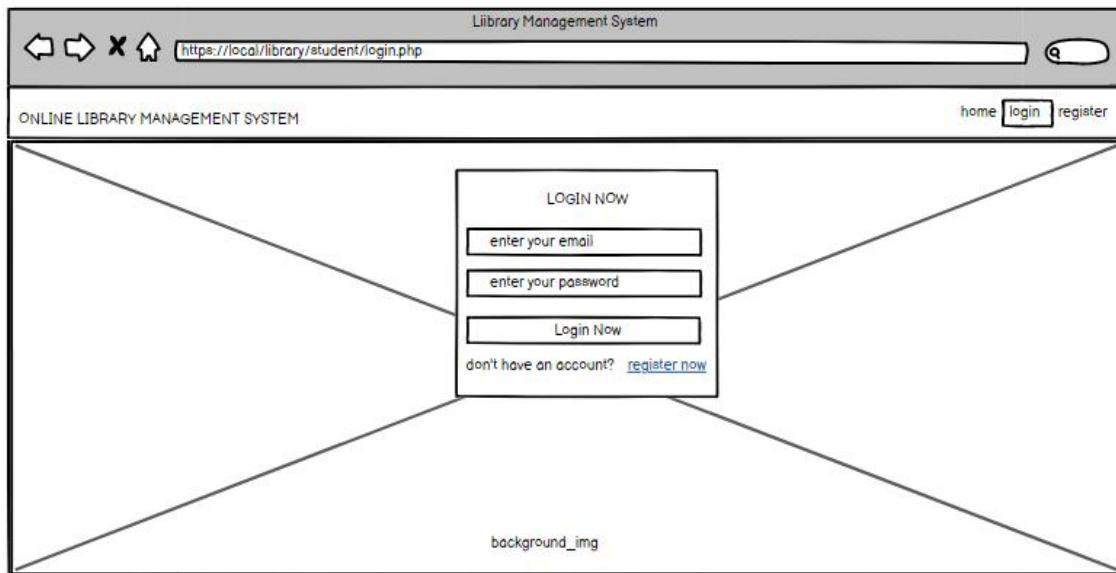


Figure 3.2.3: Login page UI

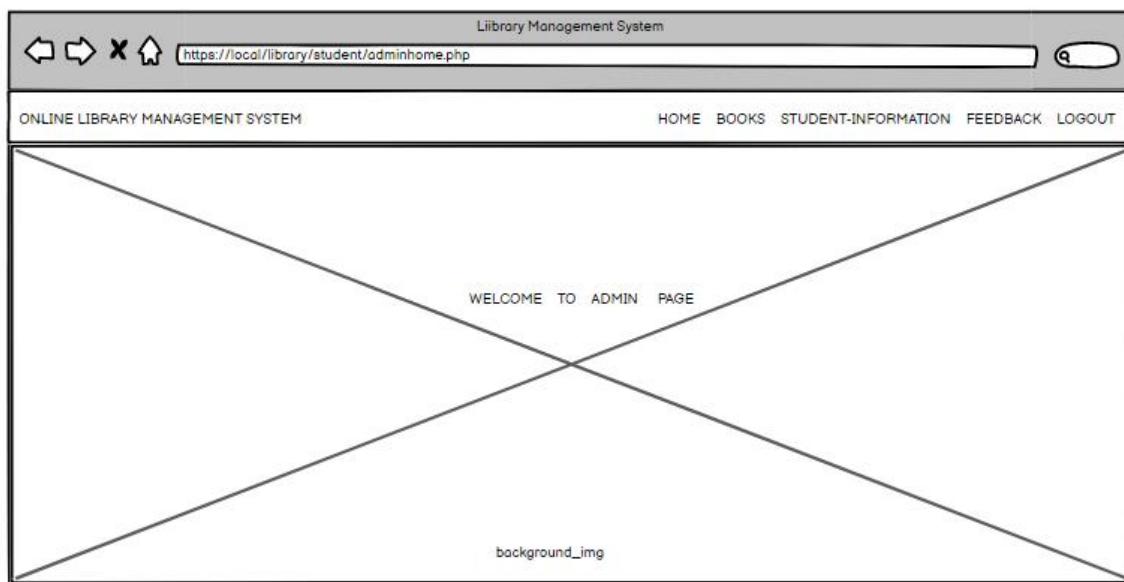


Figure 3.2.3: Admin page

Library Management System

https://local/library/student/bookdisplay.php

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION **BOOK-RECORD** BOOK-REQUEST

Add Record

Book Information

Book Name	Authors	Status	Quantity	Department	Operations
Java	Hari Niraula	Available	1	BCA	Update Delete
Scripting	Sujata Thapa	Available	2	BCA	Update Delete

Figure 3.2.3: Displaying book information UI

Library Management System

https://local/library/student/bookrecorddisplay.php

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION **BOOK-RECORD** BOOK-REQUEST

Add Record

Book Record

Student Name	Book Name	Authors	Quantity	Department	Issued Date	Returned Date	Operations
Kemuna Khadke	Java	Hari Niraula	1	BCA	2022-5-20	2022-6-20	Update Delete
Sarita Nepal	Scripting	Sujata Thapa	2	BCA	2022-4-3	2022-5-3	Update Delete

Figure 3.2.3: Displaying book record UI

Library Management System

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFO INFORMATION BOOK-RECORD **BOOK-REQUEST**

Add Record

Book Request

Student Name	Book Name	Authors	Quantity	Department	Operations
Kemuna Khadke	Java	Hari Niraula	1	BCA	Update Delete
Sarita Nepal	Scripting	Sujata Thapa	2	BCA	Update Delete

Figure 3.2.3: Displaying book request UI

Library Management System

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME **BOOK-INFO INFORMATION** BOOK-RECORD BOOK-REQUEST

BOOK-INFO INFORMATION

Book Name	<input type="text" value="Enter book name"/>
Authors	<input type="text" value="Enter authors name"/>
Status	<input type="text" value="Enter status"/>
Quantity	<input type="text" value="Enter quantity"/>
Department	<input type="text" value="Enter your department"/>

Figure 3.2.3: Adding book information UI

Library Management System

https://local/library/student/bookrecord.php

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION **BOOK-RECORD** BOOK-REQUEST

BOOK RECORD

Student Name

Book Name

Authors

Quantity

Department

Issued Date

Returned Date

This screenshot shows the 'BOOK RECORD' form within a web browser window. The title bar reads 'Library Management System' and the URL is 'https://local/library/student/bookrecord.php'. The page header includes 'ONLINE LIBRARY MANAGEMENT SYSTEM', 'HOME', 'BOOK-INFORMATION', 'BOOK-RECORD' (which is bolded), and 'BOOK-REQUEST'. The main content area is titled 'BOOK RECORD' and contains seven input fields: 'Student Name' (with placeholder 'Enter your name'), 'Book Name' (placeholder 'Enter book name'), 'Authors' (placeholder 'Enter authors name'), 'Quantity' (placeholder 'Enter quantity'), 'Department' (placeholder 'Enter your department'), 'Issued Date' (placeholder 'mm/dd/yyyy'), and 'Returned Date' (placeholder 'mm/dd/yyyy'). A 'Register' button is at the bottom.

Figure 3.2.3: Adding book record UI

Library Management System

https://local/library/student/bookrequest.php

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION BOOK-RECORD **BOOK-REQUEST**

BOOK REQUEST

Student Name

Book Name

Authors

Quantity

Department

This screenshot shows the 'BOOK REQUEST' form within a web browser window. The title bar reads 'Library Management System' and the URL is 'https://local/library/student/bookrequest.php'. The page header includes 'ONLINE LIBRARY MANAGEMENT SYSTEM', 'HOME', 'BOOK-INFORMATION', 'BOOK-RECORD', and 'BOOK-REQUEST'. The main content area is titled 'BOOK REQUEST' and contains five input fields: 'Student Name' (placeholder 'Enter your name'), 'Book Name' (placeholder 'Enter book name'), 'Authors' (placeholder 'Enter authors name'), 'Quantity' (placeholder 'Enter quantity'), and 'Department' (placeholder 'Enter your department'). A 'Register' button is at the bottom.

Figure 3.2.3: book request UI

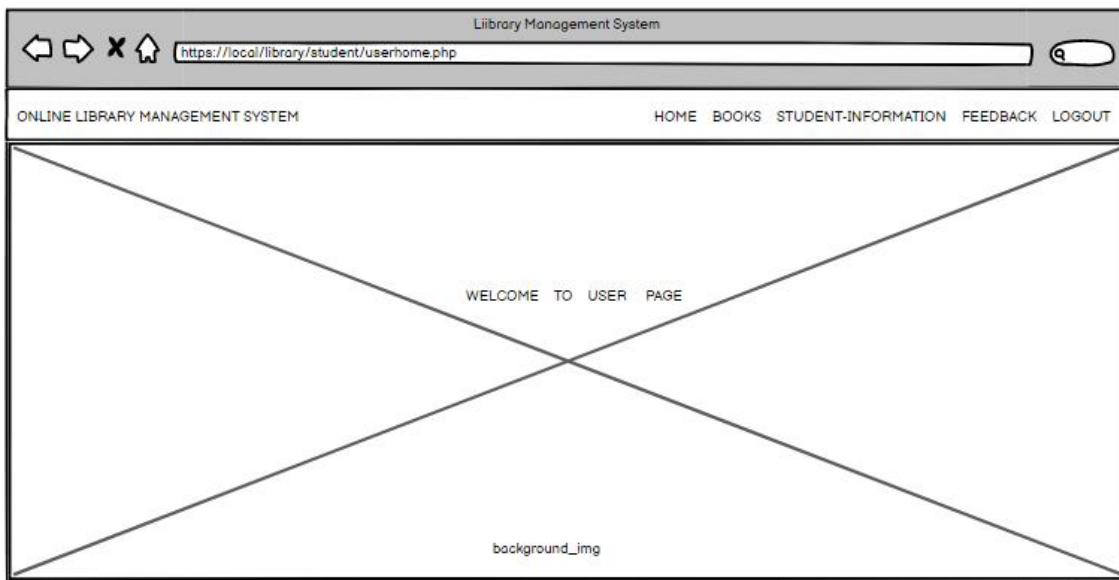


Figure 3.2.3: User page UI

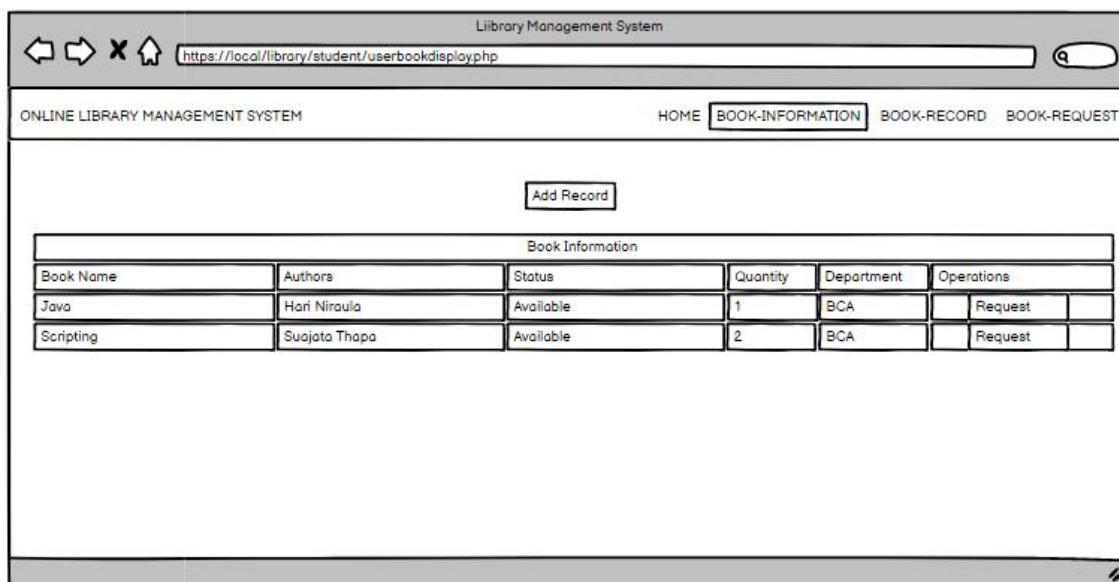


Figure 3.2.3: Displaying book information

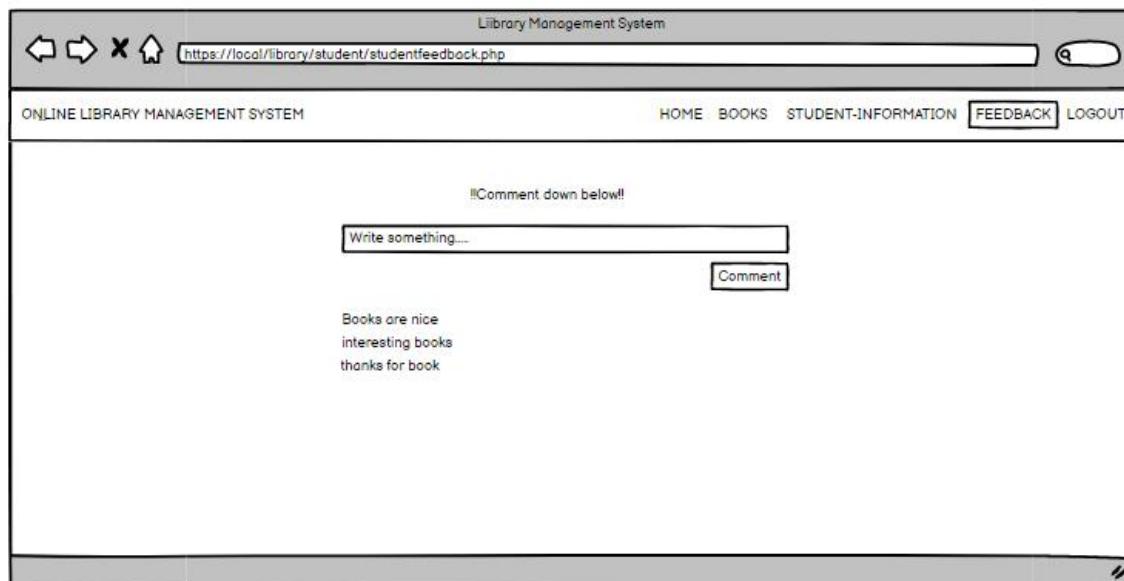


Figure 3.2.3: Feedback UI

3.2.4 Physical DFD

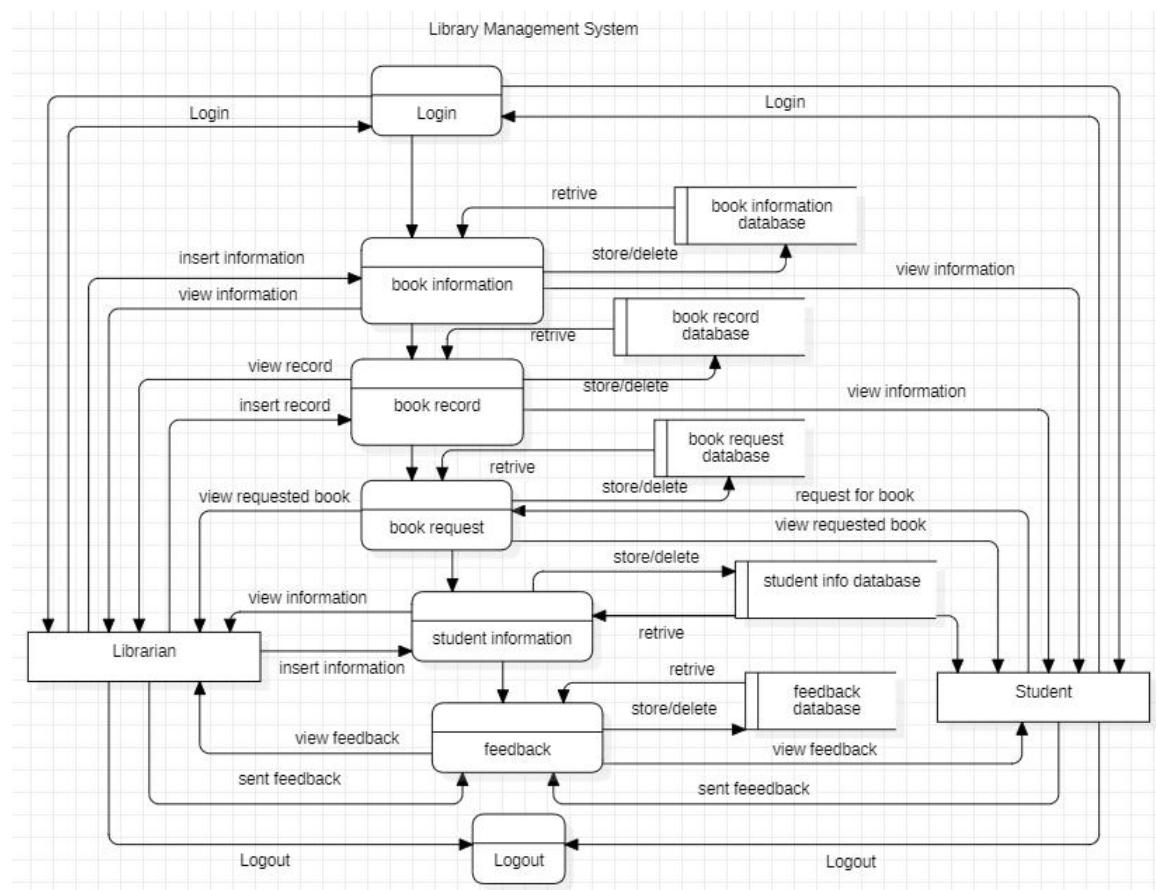


Figure 3.2.4: Physical DFD

Chapter 4: Implementation and Testing

4.1 Implementation

4.1.1 Tools Used

CASE Tools

Table 4.1.1: CASE tools

Used for	Tools and technologies			
Analysis Tools	 Visual Paradigm	 XMind	 StarUML	
Design Tools	 StarUML	 XMind		
Programming Tools				
Prototyping Tools				
Maintenance Tools				
Diagram Tools		 Visual Paradigm	 XMind	 StarUML
Process Modeling Tools	 StarUML	 XMind		
Project Management Tools				
Documentation Tools				
Configuration Management Tools				

Change Control Tools	ProjectLibre™
Web Development Tools	  
Quality Assurance Tools	

Visual Paradigm



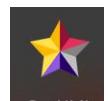
Visual Paradigm is a management tool for IT system which is a powerful, cross-platform and easy-to-use design. Visual Paradigm is an application software which is used by the software development teams to build quality applications faster, better and cheaper. It provides facilities of report generation and code engineering capabilities including code generation. You can draw all kinds of UML 2.x diagrams in Visual Paradigm's uml tools.[\[7\]](#)

Xmind



XMind is a software developed by XMind Ltd. It is a mind mapping and brainstorming software. The software can be used to capture ideas, clarify thinking, manage complex information, and promote team collaboration. XMind was selected as the most popular mind mapping software on Lifehacker. XMind is used for knowledge management, meeting minutes, task management. It also supports mind maps, fishbone diagrams, tree diagrams, organization charts, spreadsheets, etc.[\[8\]](#)

StarUML



StarUML is an open source software modeling tool which supports the UML (Unified Modeling Language) framework for system and software modeling. It allows to access to all functions of the model/meta-model and tool through COM Automation and provides extension of menu and option items. It allows users to create to their own

approaches and frameworks according to their methodologies. It is used in Unified Modelling Language where system and software modeling is supported with the UML concept to generate code for different languages by providing different types of UML diagram to develop fast and flexible UML platform.[9]

Balsamiq



Balsamiq Cloud is a web-based user interface design tool for creating wireframes. You can use it to generate digital sketches of your idea or concept for an application or website, to facilitate discussion and understanding before any code is written. The completed wireframes can be used for user testing, clarifying your vision, getting feedback from stakeholders, or getting approval to start development.[10]

Sublime Text



Sublime Text is a shareware cross-platform source code editor which supports many programming languages and markup languages. Users can expand its functionality with plugins, typically community-built and maintained under free-software licenses[11]

Storyboard



The Storyboard Creator is a graphic designing website through which textual form story can be created. The Storyboard Creator is an award-winning, powerful tool for students, teachers and anyone looking to infuse creativity into their work. It is perfect for creating storyboards, graphic organizers, comics, and meaningful visual assets. Storyboard That brings learning and imagination together in an easy-to-use interface. The Storyboard Creator uses a simple drag-and-drop technology for a fun and easy creation experience for people of all ages and abilities. Anybody can be creative with this intuitive platform. This tool is easy to use and helps to show different types of information in the form of images, pictures, etc. As it's have many types of images content like character, dialogue box, locations, etc.[12]

Project Libre

 ProjectLibre™ ProjectLibre is a free and open source software for effective project management. It is the project management tools which is used to complete project details including time periods as required. It helps to create the time line and deadlines of the project. This tools also helps to show the needed or required time to complete the project. It is developed by the founders of OpenProj project, ProjectLibre is available under the Common Public Attribution License (CPAL). It has become immensely popular and is adopted by users of all scales—home businesses, small offices as well as multinational companies.[\[13\]](#)

WPS Office



WPS(Writer Presentation Spreadsheet Office). WPS office is a free office software which involves Writers, Spreadsheet, Presentation and PDF. WPS Office is a file sharing and productivity suite designed to help businesses of all sizes create, edit, and share presentations, documents, and spreadsheets with clients or team members. It offers a PDF editor, which enables stakeholders to convert Microsoft Word documents into PDF files, add comments, compress file size, remove watermarks, and more. The application provides a built-in optical character recognition (OCR) capability, which enables employees to convert printed characters or images into digital text in real-time. Features of WPS Office include cloud storage, automated backup, template gallery, scanning, file recovery or repair, multi-language support, and more. Using WPS data recovery master, administrators can automatically perform deep data scans and restore permanently deleted data including images, audios and videos. It allows to achieve high work efficiency anytime and anywhere.[\[14\]](#)

Google Chrome



Google Chrome is a free web browser developed by Google, used for accessing web pages on the internet. Google Chrome is also a cross-platform browser, meaning some versions work on different computers, mobile devices, and operating systems. It is used for displaying the contents of the web pages available on the internet. This browser

also provides the features of better security and better organization. According to Statista, Google Chrome for Android is the most used version, holding more than 36% of the global web browser market share as of January 2022.[15]

Microsoft Edge



Microsoft Edge was released in January 2020. It is the replacement of Internet Explorer. This open-source version of the browser uses the source code from Chromium, the open-source version of Google Chrome. It shares many features and menu options with Chrome, but has a different overall structure and aesthetic.[16]

Table 4.1.1: Programming tools

Used for	Tools and technologies
Programming languages	

HTML



HTML stands for hypertext markup language. It is the standard markup language for creating web pages. The HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.[17]

JavaScript



JavaScript is a programming language used primarily by web browser to create a dynamic and interactive experience for the user. It is lightweight, interpreted

programming language. It is designed for creating network-centric applications. It is easy to implement because it is integrated with HTML. It is open and cross-platform. It allows you to implement dynamic features on web pages that cannot be done with only HTML and CSS.[\[18\]](#)

CSS



Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.[\[19\]](#)

PHP



PHP is widely used open source general purpose Server side language. PHP means Hypertext Preprocessor. PHP is used to develop dynamic websites or web applications. PHP scripts can only be interpreted on a server that has PHP installed. The client computers accessing the PHP scripts a web browser only. A PHP file contains PHP tags and ends with the extension “.php”.[\[20\]](#)

Ajax



AJAX stands for Asynchronous JavaScript and XML, which describes a set of development techniques used for building websites and web application. Ajax is a technique for creating fast and dynamic web pages and allows data to be loaded into web pages without having to reload the whole web page. It is a Client side web technique. Using JavaScript with AJAX, it is possible to make background server calls for fetching additional data, updating some portion in web pages without refreshing the whole page.[\[21\]](#)

Jquery



JQuery is a library that makes it quicker and easier to build JavaScript webpages and web apps. Often with Query you can write a single line of code to achieve what would have taken 10 - 20 lines of regular JavaScript code. JQuery allows web developers to plug routine JavaScript features into a web page so they can spent more time focusing on complicated features that are unique to their site.[\[22\]](#)

MY SQL



MySQL is one of the most popular relational database systems being used on the web. MySQL is the most popular database system use in PHP. As with other relational databases, MySQL stores data in tables made up of rows and columns. Users can define, manipulate, control, and query data using Structured Query Language, more commonly known as SQL. MySQL's name is a combination of "My," the name of MySQL creator Michael Widenius's daughter, and "SQL".[\[23\]](#)

4.1.2 Implementation Details of Modules

User Module

Users are those persons who are the members of website. Users can some features like:

New user register

The user have to register to enter inside the system

Student Login

The user have to login first with their email and password to login inside the system.

View book

The users can view the list of books.

Search book

The user can search book based on book name, or by author name.

Issue Book

The user can get the required book issued.

Return Book

The user have to return the book on time, before the last date.

Request Book

The users can request books according to their requirements.

Feedback

The users can give feedback and suggestion regarding the books.

Admin Module

The admin is the person who decides authentication and authorization for all the different users of the application. The admin has features like:

Register

The admin also have to register to enter inside the system.

Login

The admin also have to login first with their email and password to login inside the system.

Addition

The admin can add students and books inside the system.

Deletion

The admin can delete the record of students and books if not needed.

Update

The admin can update the record of student and books if there is any change or mistake in the records.

Search

The admin can search the students and books information.

Librarian

Librarian are the library staff who are required to enter the records in the system and keep an eye on the various activities like the issue of the book, the return of the book etc.

4.2 Testing

4.2.1 Test Cases for System Testing

Table 4.2.1: System testing

S.No	Test Name	Input	Expected Output	Actual Output	Test Result
1	Launch System	localhost/library/student/index.php	Home page	Home page	Pass
2	Enter name, email, password	Name: Susan Budhathoki Email: <u>susan@gmail.com</u> Password: *****	Register successful	Register successful	Pass
3	Enter incorrect email and password	Email:ssusan@gmail.com Password:*****	The email and password you have entered does not matched.	The email and password you have entered does not matched.	Pass
4	Enter correct email and password	Email: <u>susan@gmail.com</u> Password: *****	Login successful	Login successful	Pass

Table 4.2.1: Unit testing

S.No	Test Name	Input	Expected Output	Actual Output	Test Result
1	On click of ADD button	First user have to fill all fields with proper data.	Data added	Data not added	Fail
2	On click of ADD button	First user have to fill all fields with proper data.	Data added	Data added	Pass
3	On click of UPDATE button	Edits the data	Data updated	Data not updated	Fail
4	On click of UPDATE button	Edits the data	Data updated	Data updated	Pass
5	On click of DELETE button	Deletes the data	Data deleted	Data not deleted	Fail
6	On click of DELETE button	Deletes the data	Data deleted	Data deleted	Pass
7	On click of SEARCH button	Displays the searched book name	Search successful	Search successful	Pass

Chapter 5: Conclusion and Future Recommendation

5.1 Lesson Learnt / Outcome

Library Management System is my first project so, I have faced many problems and also learned many things from this project. At first I faced problem in documentation but with my teacher guidance and support I started the documentation and completed it anyway. The main problem was with the coding section. Being a BCA student I have already learnt different programming language and have knowledge about it but in the time of implementation I have faced many problems. I didn't have knowledge about how to run XAMPP and create database in MYSQL and connect them in PHP but with the help of my teacher I was being able to do so. At the time of coding not only my teachers I took the help from internet like YouTube and started doing coding and I was successful in making my website. As every project is an opportunity to gain new experience. Through this project I have gained many new experience related to IT and was capable of coding on my own and also learnt how to deal with the errors. Doing coding on my own have helped me to be confident and to gained experience. In my project I have used waterfall model as it is suitable for small project only.

5.2 Conclusion

Finally, I have completed my project meeting all the guidelines and requirements of Tribhuvan University(TU). In my project, I have tried to overcome the problems of existing system. My project was “LIBRARY MANAGEMENT SYSTEM” which is a computerized system and was made to reduce human errors and to increase the efficiency. The maintenance of the record is made efficient, as all the record are stored in the access database, through which data can be retrieved easily. This system is made so that the problems will be solved and correct information of students and books will be recorded in the library in proper way. This project tries to satisfies user's requirements.

5.3 Future Recommendation

In my project, I have made simple online library management system with the features like login and register. In this students can search, view, request the books as their need and they can also give the suggestion and feedback regarding the book. In future, this system will have more features like students can request the book and admin will get the notification, there will be chatting system between the students and admin, when student will borrow the book and not return it on time then there will be the system of fine calculation. Students can also buy the books when needed.

Appendices

phpMyAdmin

Server: 127.0.0.1 » Database: library » Table: bookinformation

Browse Structure SQL Search Insert Export Import Privileges Operations Trace

Recent Favorites

New information_schema library New bookinformation bookrecord bookrequest books comments information message users mysql performance_schema phpmyadmin susanlms test tms user_db

Showing rows 0 - 6 (7 total, Query took 0.0003 seconds.)

SELECT * FROM `bookinformation`

Profiling [Edit inline] [Explain SQL] [Create PHP code] [Refresh]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	id	name	authors	status	quantity	department
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	8	dbms	hari thapa	available	5	bca
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	9	computer	ramesh singh	available	5	bca
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	10	english	sarita thapa	available	4	bca
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	11	maths	rupendra shrestha	available	2	bca
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	12	DBMS	Bhupendra Sing Saud	Available	1	BCA
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	13	project	rupendra shrestha	available	2	bca
<input type="checkbox"/> Edit <input type="button" value="Copy"/> <input type="button" value="Delete"/>	14	java	ramesh singh	available	2	bca

Check all With selected:

phpMyAdmin

Server: 127.0.0.1 » Database: library » Table: bookrecord

Browse Structure SQL Search Insert Export Import Privileges Operations Trace

Recent Favorites

New information_schema library New bookinformation bookrecord bookrequest books comments information message users

mysql performance_schema phpmyadmin susanlms test tms user_db

Showing rows 0 - 8 (9 total, Query took 0.0003 seconds.)

SELECT * FROM `bookrecord`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	id	sname	bname	authors	quantity	department	issued	returned
<input type="checkbox"/> Edit Copy Delete	2	sita	java	hari thapa	5	bca	2022-08-31	2022-09-08
<input type="checkbox"/> Edit Copy Delete	3	kemuna	scripting	ramesh singh	1	bca	2022-08-23	2022-09-23
<input type="checkbox"/> Edit Copy Delete	4	ramesh	english	satira thapa	2	bca	2022-08-09	2022-09-09
<input type="checkbox"/> Edit Copy Delete	5	raj	maths	rupendra shrestha	5	bca	2022-08-25	2022-09-25
<input type="checkbox"/> Edit Copy Delete	6	seeta	java	Bhupendra Sing Saud	1	BCA	2022-08-23	2022-09-23
<input type="checkbox"/> Edit Copy Delete	7	raj	software	ramesh singh	1	bca	2022-08-01	2022-09-01
<input type="checkbox"/> Edit Copy Delete	9	raj	english	satira thapa	5	bca	2022-08-11	2022-09-11
<input type="checkbox"/> Edit Copy Delete	10	kemuna	java	hari thapa	2	bca	2022-08-23	2022-09-23

phpMyAdmin

Server: 127.0.0.1 » Database: library » Table: bookrequest

Browse Structure SQL Search Insert Export Import Privileges Operations

Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

SELECT * FROM `bookrequest`

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

	T		id	sname	bname	authors	quantity	department
<input type="checkbox"/>	Edit	Copy	5	sita	java	hari thapa	3	bca
<input type="checkbox"/>	Edit	Copy	6	sita	software	hari thapa	1	bca
<input type="checkbox"/>	Edit	Copy	7	sita	java	hari thapa	5	bca
<input type="checkbox"/>	Edit	Copy	8	raj	java	hari thapa	4	bca
<input type="checkbox"/>	Edit	Copy	9	Christina	Computer science	Himesh Thapa	1	BCA

Check all With selected: [Edit](#) [Copy](#) [Delete](#) [Export](#)

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

phpMyAdmin

Server: 127.0.0.1 » Database: library > Table: users

Browse Structure SQL Search Insert Export Import Privileges Operations

Showing rows 0 - 4 (total, Query took 0.0005 seconds.)

SELECT * FROM `users`

Profile [Edit inline] [Explain SQL] [Create PHP code] [Refresh]

Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

Extra options

		name	email	password	user_type
<input type="checkbox"/>	1	tina	tina@gmail.com	0	user
<input type="checkbox"/>	6	reema	reema@gmail.com	f899139d5e1059396431415e770c6dd	user
<input type="checkbox"/>	9	susan	susan30@gmail.com	1ff1de774005f8da13f42943881c655f	user
<input type="checkbox"/>	11	bima	bima@gmail.com	0a113ef6b61820daa5611c870ed8d5ee	user
<input type="checkbox"/>	12	Susan	susan@gmail.com	4a06d868d044c50af0cf9bc82d2fc19f	admin

Check all With selected: Edit Copy Delete Export

C:\xampp\htdocs\library\student\connection.php (library) - Sublime Text (UNREGISTERED)

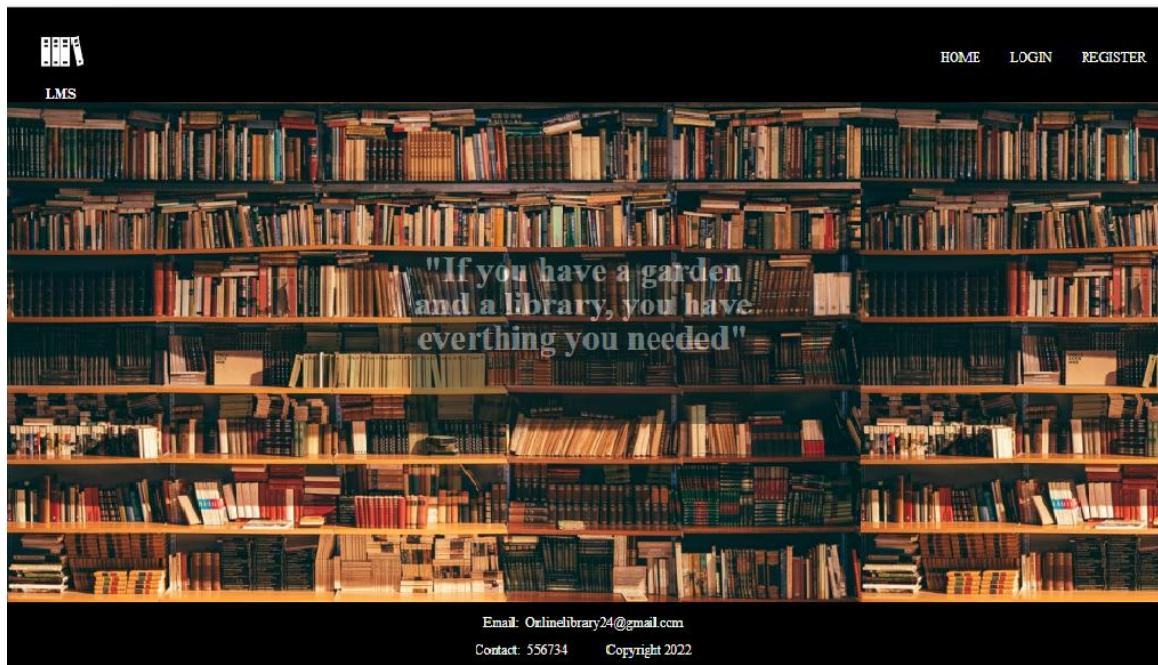
File Edit Selection Find View Goto Tools Project Preferences Help

connection.php

```

1 <?php
2
3 $db=mysqli_connect("localhost","root","","library");
4
5 if(!$db)
6 {
7 die("Connection failed: " . mysqli_connect_error());
8 }
9
10 echo "";
11
12 ?>

```





Book Information					
Book Name	Authors	Status	Quantity	Department	Operations
dbms	hari thapa	available	5	bca	<button>Update</button> <button>Delete</button>
computer	ramesh singh	available	5	bca	<button>Update</button> <button>Delete</button>
english	sarita thapa	available	4	bca	<button>Update</button> <button>Delete</button>
maths	rupendra shrestha	available	2	bca	<button>Update</button> <button>Delete</button>
DBMS	Bhupendra Sing Saud	Available	1	BCA	<button>Update</button> <button>Delete</button>
project	rupendra shrestha	available	2	bca	<button>Update</button> <button>Delete</button>
java	ramesh singh	available	2	bca	<button>Update</button> <button>Delete</button>

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION BOOK-RECORD BOOK-REQUEST

[Add Record](#)

Book Record								
Student Name	Book Name	Authors	Quantity	Department	Issued Date	Returned Date	Operations	
sita	java	hari thapa	5	bca	2022-08-31	2022-09-08	Update	Delete
kemuna	scripting	ramesh singh	1	bca	2022-08-23	2022-09-23	Update	Delete
ramesh	english	sarita thapa	2	bca	2022-08-09	2022-09-09	Update	Delete
raj	maths	rupendra shrestha	5	bca	2022-08-25	2022-09-25	Update	Delete
seeta	java	Bhupendra Sing Saud	1	BCA	2022-08-23	2022-09-23	Update	Delete
raj	software	ramesh singh	1	bca	2022-08-01	2022-09-01	Update	Delete
raj	english	sarita thapa	5	bca	2022-08-11	2022-09-11	Update	Delete
kemuna	java	hari thapa	2	bca	2022-08-23	2022-09-23	Update	Delete
kemuna	java	hari thapa	2	bca	2022-08-23	2022-09-23	Update	Delete

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOKS STUDENT-INFORMATION FEEDBACK LOGOUT

[Add Record](#)

Student Information					
Name	Email	Address	Gender	Contact	Operations
raj	raj30@gmail.com	hattiban	Male	9865456	Update Delete
teekaii	teekaii@gmail.com	lagankhel	Female	878667	Update Delete
rami	ram@gmail.com	ranimagar	Female	4565	Update Delete
tsa	tsa@gmail.com	tsakhel	Male	06887575	Update Delete
sita	sita@gmail.com	itahari	Female	97755	Update Delete
sujan	sujan@gmail.com	hattiban	Male	098976	Update Delete
raja	raja@gmail.com	talchikhel	Male	859767589	Update Delete

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOKS STUDENT-INFORMATION FEEDBACK LOGOUT

STUDENT-INFORMATION

Name	<input type="text" value="Enter your name"/>
Email	<input type="text" value="Enter your email"/>
Address	<input type="text"/>
Gender	<input type="select" value="Select"/>
Contact	<input type="text" value="Enter your number"/>
Register	

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION BOOK-RECORD BOOK-REQUEST

Book Information					
Book Name	Authors	Status	Quantity	Department	Operations
dbms	hari thapa	available	5	bca	<button>Request</button>
computer	ramesh singh	available	5	bca	<button>Request</button>
english	sarita thapa	available	4	bca	<button>Request</button>
maths	rupendra shrestha	available	2	bca	<button>Request</button>
DBMS	Bhupendra Sing Saud	Available	1	BCA	<button>Request</button>
project	rupendra shrestha	available	2	bca	<button>Request</button>
java	ramesh singh	available	2	bca	<button>Request</button>

ONLINE LIBRARY MANAGEMENT SYSTEM

HOME BOOK-INFORMATION BOOK-RECORD BOOK-REQUEST

BOOK-REQUEST

Student Name	<input type="text" value="Enter your name"/>
Book Name	<input type="text" value="Enter book name"/>
Authors	<input type="text" value="Enter authors name"/>
Quantity	<input type="text" value="Enter quantity"/>
Department	<input type="text" value="Enter your department"/>

Log Sheets

Log Sheet for the Library management system	
Student name	Susan Budhathoki
Email Id	budhathokisusan@gmail.com
University name	Tribhuvan University
College name	Nims College
College address	Kanibahal, Lalitpur
Supervisor name	Ujjwal Bhusal
Course & Code	Project-I 256

Meeting, Notes and Background Research		
Date	Tasks	Signature
2022/1/3	Submission of one page proposal with the title of the project	
2022/1/20	Submission of proposal of the project with the objective, problem and solution	
2022/1/24	We learned to use visual paradigm to show objective of the project	
2022/1/28	To show the pictorial problem and solution of the project we learned to use storyboard.	
2022/2/3	We learned to research about the background and literature review related to our topic. Here we learned to citation.	
2022/2/20	Here we learned to use the Gantt chart. We learned to use Star uml to design the ER diagram for our system. We show the relationship between the entity. We also learned to make Data flow diagram of different level.	
2022/3/8	We started to make UI diagram and design of our system by making account of balsamic.	
2022/4/8	We started coding	
2022/5/9	We show to the teacher the functionality of the project and error discussion	
2022/6/21	We show the layout of the project and ask teacher recommendation.	
2022/8/24	Final documentation and code presentation to the teacher	

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