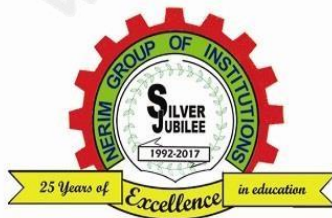


**MAJOR PROJECT REPORT
ON
“LIBRARY MANAGEMENT SYSTEM”**

Submitted for the partial fulfillment of the requirement for
Major project work of 6th semester of Bachelor of Computer Application
(BCA) program

Department of Computer Science
NERIM GROUP OF INSTITUTIONS



Padma Nath Sharma Bhawan, Jayanagar, Guwahati-22

SUBMITTED BY

M Bishal Singh
BCA 6th semester
Registration no.: 19948680
Roll no.: 31620026

Internal Guide

Dr Tarali Kalita
Professor, Department of
computer science, NERIM ,
Guwahati

Organization Guide

Romya knkor
Fineworks Technologies
and midia solution llp
Guwahati

CERTIFICATE OF APPROVAL

This is to certify that the project work entitled " **Library Management System** " is carried out by student name bearing exam **Registration No:** 19948680, Roll no: 31620026 of Dept. of Computer Science, NERIM, Guwahati under the Organizational guidance of "***Romya knkor Fineworks Technologies and midia solution llp Guwahati***", and Internal guidance of "**Dr Tarali kalita**", Asst. Professor, Dept. of Computer Science, NERIM, Guwahati has been found satisfactory and is hereby approved as a project work carried out and presented in a manner required for its acceptance in partial fulfilment of course work of 6th semester of 3 year full time BCA under Dibrugarh University, Dibrugarh, Assam.

Internal Examiner

External Examiner

Date:

Date:

Place: NERIM, Guwahati

PROFORMA FOR SUBMISSION OF STUDENT PROJECT PROPOSAL

1. Name & Address of the Organization: Fineworks Technologies and media
dolution llp,
Guwahati
2. Name & Address of the Student: M Bishal Singh,
Rongpur part 4,
Post Office – Rongpur
Pin – 788001
Dist – Cachar, Assam
3. Title of the project: Library Management System
4. Name & Address of the Guide: Romya knkor
Guwahati
5. Qualification of the guide: BTECH in computer science
6. Working/Teaching Experience of the guide: 16 years

Student date:

External guide date:

ACKNOWLEDGEMENT

At the very inception I would like to take privilege to thank “**Romya knkor**”in course of undergoing my project.

I would like to thank Dr. Hillol Kanti Bhattacharjee, HOD, Computer Science Department, NERIM for his valuable suggestion.

With immense pleasure I acknowledge my inertness to all persons whose support and guidance have helped me in carrying out this project.

I would like to express my deep sense of gratitude to “**Romya knkor Fineworks Technologies and midia solution llp Guwahati**” for their guidance along with valuable suggestions, references and encouragement.

Also,I acknowledge most sincerely my heartiest thanks and gratitude to my internal guide “**Dr Tarali Kalita**” who has guided me throughout the period of this projectwork.

To those mentioned above and to those who inspired and encouraged me, I would like to express my gratitude once again.

With regards

M Bishal Singh

Registration No: 19948680

Roll NO:31620026

BCA 6th semester

DECLARATION

I hereby declare that the project work called " **Library Management System**" submitted to the Computer Science Department of NERIM, Guwahati under Dibrugarh University is a record of an original work done by me under the guidance of "***Romya knkor Fineworks Technologies and midia solution llp Guwahati***" and "**Dr Tarali Kalita**" and this project is submitted for the partial fulfilment of the degree of Masters of Computer Application under Dibrugarh University, Dibrugarh, Assam. The results embodied in this, have not been submitted to any other University or Institute.

With regards

M Bishal Singh

Registration No:
19948680

Roll No: 31620026

BCA 6th semester

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CHAPTER 1: INTRODUCTION

CHAPTER - 1

TITLE OF THE PROJECT

“LIBRARY MANAGEMENT WEB APPLICATION”

1.1 INTRODUCTION

Library Management System is an application which refers to library systems which are generally small or medium in size. It is used by librarian to manage the library using a computerized system where he/she can record various transactions like issue of books, return of books, addition of new books, addition of new students etc. Books and student maintenance modules are also included in this system which would keep track of the students using the library and also a detailed description about the books a library contains. With this computerized system there will be no loss of book record or member record which generally happens when a non-computerized system is used. All these modules are able to help librarian to manage the library with more convenience and in a more efficient way as compared to library systems which are not computerized.

1.2 PROJECT DEFINITION

Modern Generation is going to dependable on computer and through computer we use Software. Also, Libraries are essential is a process of giving citizen access in knowledge. In digital times they are needed more then before. Now library system is written in paper that's why we have to cut down the tree to make paper and sometime the record can be destroyed. So, the aim of this project is to develop a system that can handle and manage the activities involved in the library in an

efficient and reliable way. Less managing personal and easy searching availability and user profile managing are the major goal in this project.

1.3 BRIFE OF ORGANISATION

Fineworks Technologies And Media Solution is a Limited Liability Partnership firm incorporated on 02 November 2017. It is registered at Registrar of Companies, Shillong. Its total obligation of contribution is Rs. 100,000.

Designated Partners of Fineworks Technologies And Media Solutio are Nishant Kumar, Awinash Kumar Jaiswal, Ramyakinkor Koch and Rupam Talukdar.

Fineworks Technologies And Media Solution's last financial year end date for which Statement of Accounts and Solvency were filed is N/A and as per records from Ministry of Corporate Affairs (MCA), date of last financial year end date for which Annual Return were filed is N/A.

Current status of Fineworks Technologies And Media Solution is - Active

1.4 OBJECTIVE

The objective of the system are as follows:

- Admin get all the data stored.
- Less prone to error and reduce manual records.
- The system is user friendly.
- To make books available to everyone.
- Anyone can take and return the books.

1.5 PROPOSED SYSTEM

The project Library Management System aims at developing a fully functional computerized system to maintain all the day-to-day activity of a library. This project has many features which such as the facility of user login and teacher's login. Also, on top of all this, there is an admin who will be managing the entire application's authorization and authentication, not no intruder can log in and modify the data, as a login for admin is also available.

The various modules of this system areas:

User Module:

This module is further divided into various sub-modules describing the user in a better way:

New user register:

To sign up a new user to this system.

Search book:

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

Issue Book:

To help the user get the required books issued.

Return Book:

To return the book before the last date without fine, or after the specified time duration with a late fine.

Admin Module:

It is to be operated by the admin with a unique id and password. The admin is the person who decides authentication and authorization for all the different users of the application.

1.6 HARDWARE AND SOFTWARE

Hardware specification

- Processor: Ryzen 3
- Ram: 1GB or more
- Hard Disk: 20GB or more
- Keyboard: Standard
- Mouse: Optical

Software specification

- Operating system: Windows 7 or better
- Server:
- Front End:
- Back End:
- Database: Mongobd atlas

CHAPTER 2: SYSTEM ANALYSIS

CHAPTER -2

SYSTEM ANALYSIS

2.1 INTRODUCTION

System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem-solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose. It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. Analysis specifies what the system should do.

2.2 FEASIBILITY STUDY

2.2.1 INTRODUCTION

Feasibility is defined as the practice extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. The objective of the feasibility study is to establish the reasons for developing the software that is acceptable to users, adaptable to change and comfortable to establish standards.

2.2.2 ECONOMIC FEASIBILITY

Economic feasibility looks at the financial aspects of the project. It is most frequently used technique for evaluating the effectiveness of a proposed system. Economic feasibility is more commonly known as cost/benefit analysis. The procedure is to determine the benefits and savings that are expected from a proposed system and compare them with cost. If benefit outweighs costs, a decision is taken to design and implement the system. Otherwise, further justification.

The proposed system is economically feasible because

- The cost of the hardware and software is quite affordable.

2.2.3 TECHNICAL FEASIBILITY

The technical feasibility assessment is focused on gaining and understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is the evaluation of the hardware and software and how it meets the needs of the proposed system.

The proposed system is technically feasible because

- To run the software comparatively very less amount of hardware is required such as a monitor, a CPU with minimal amount of RAM, web browser, windows operating system.

2.2.4 BEHAVIORAL FEASIBILITY

In this study, a judgment has to be made as how strong a reaction the use is likely to have towards the development of a computer system. In general, people resistant to change and computer have been known to facilitate change. A survey should be made of how strong a reaction the user staff is likely to have towards the development of computerized system.

2.3 SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

SRS for User

Sl no	Requirement name	Requirement Description	Priority
SRS001	Log in	This function will enable the patient to log into the system by providing a valid username and password	Mandatory Requirement
SRS001.1*	Log in	If found valid then the system will direct the patient to the home page	Mandatory Requirement
SRS001.2*	Log in	If found invalid the system will pop up saying user doesn't exist	Mandatory Requirement
SRS002	Book appointment	Patient can book appointment	Mandatory Requirement
SRS003	Update	Patient can update his/her details	Mandatory Requirement
SRS004	View	Patient can view doctor details	Mandatory Requirement

SRS for Admin

Sl no	Requirement name	Requirement Description	Priority
SRS001	Log in	This function will enable the admin to log into the system by providing a valid username and password	Mandatory Requirement
SRS001.1*	Log in	If found valid then the system will direct the admin to the home page	Mandatory Requirement
SRS001.2*	Log in	If found invalid the system will pop up saying user doesn't exist	Mandatory Requirement
SRS002	All Book	Book panel will open	Mandatory Requirement
SRS003	All new Books	Admin can add Books	Mandatory Requirement
SRS004	Update Books	Admin can update the Book Informantion	Mandatory Requirement
SRS005	Delete Books	Admin can delete the Books	Mandatory Requirement
SRS006	All user	User panel will open	Mandatory Requirement
SRS007	Delete user	Admin can delete the user	Mandatory Requirement

2.3.1 FUNCTIONAL REQUIREMENT

The Librarian does the following function(s):-

1. Add Article

New entries must be entered in database

2. Update Article

Any changes in articles should be updated in case of update

3. Delete Article

Wrong/Expiry/Un-usable entry must be removed from system

4. Inquiry Members

Inquiry all current enrolled members to view their details.

5. Inquiry Issuance

Inquiry of all database articles

6. Check out Article

To issue any article must be checked out

7. Check In article

After receiving any article system will reenter article by Checking

8. Inquiry waiting for approvals

Librarian will generates all newly application which is in waiting list

9. Reserve Article

This use case is used to reserve any book with the name of librarian, it can be pledged

10. Set user Permission

From this user case Librarian can give permission categorically, also enabling/disabling of user permission can be set through this use case.

MEMBER does the following function(s):-

1. Authentication

User must authenticated before accessing system

2. Search Article

User can search any article

3. Request Article

After successful searching member mark this book as requested article

4. Check Account

This use case is used to check account details

2.3.2 NON-FUNCTIONAL REQUIREMENT

Safety Requirements

The database may get crashed at any certain time due to virus or operating system failure. Therefore it is required to take the database backup.

Security Requirements

We are going to develop a secured database for the university .There are different categories of users namely teaching staff, administrator, library staff ,students etc., Depending upon the category of user the access rights are decided. It means if the user is an administrator then he can be able to modify the data, delete, append etc., all other users other than library staff only have the rights to retrieve the information about database.

Software Quality Attributes

The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database

Hardware Constraints

The system requires a database in order to store persistent data. The database should have backup capabilities.

Software Constraints

The development of the system will be constrained by the availability of required software such as database and development tools

2.4 STRUCTURED ANALYSIS AND DESIGN

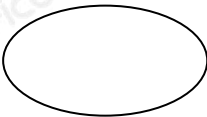
2.4.1 DATA FLOW DAIGRAM (DFD)

A data flow diagram (dfd) is a graphically representation of the flow of data through an information system. It shows how information is input to and output from the system, the sources and destinations of that information, and where that information is stored.

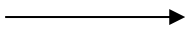
The following diagram diagrams illustrate notation and symbol used to construct DFD :



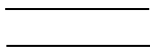
External Entity



A process



Data flow

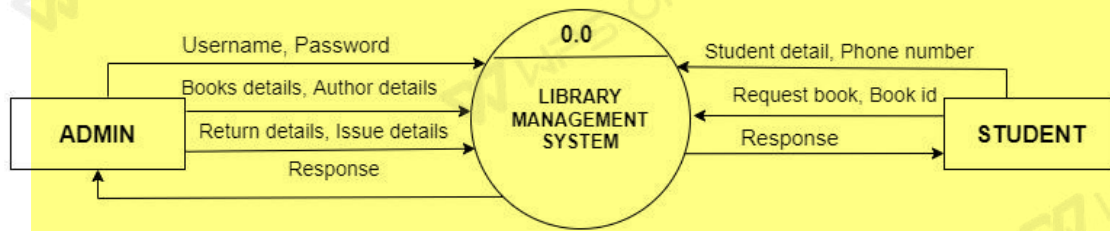


Data storage

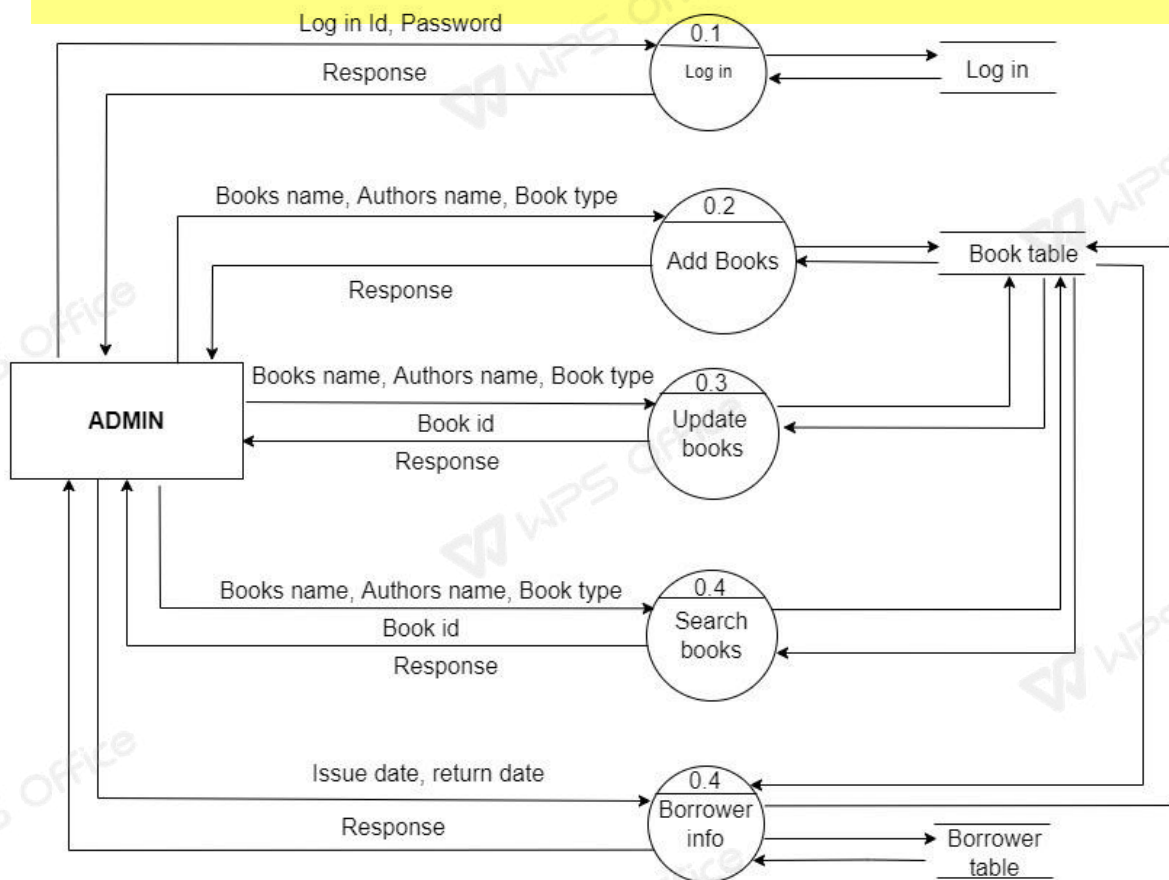


Report or output from the system

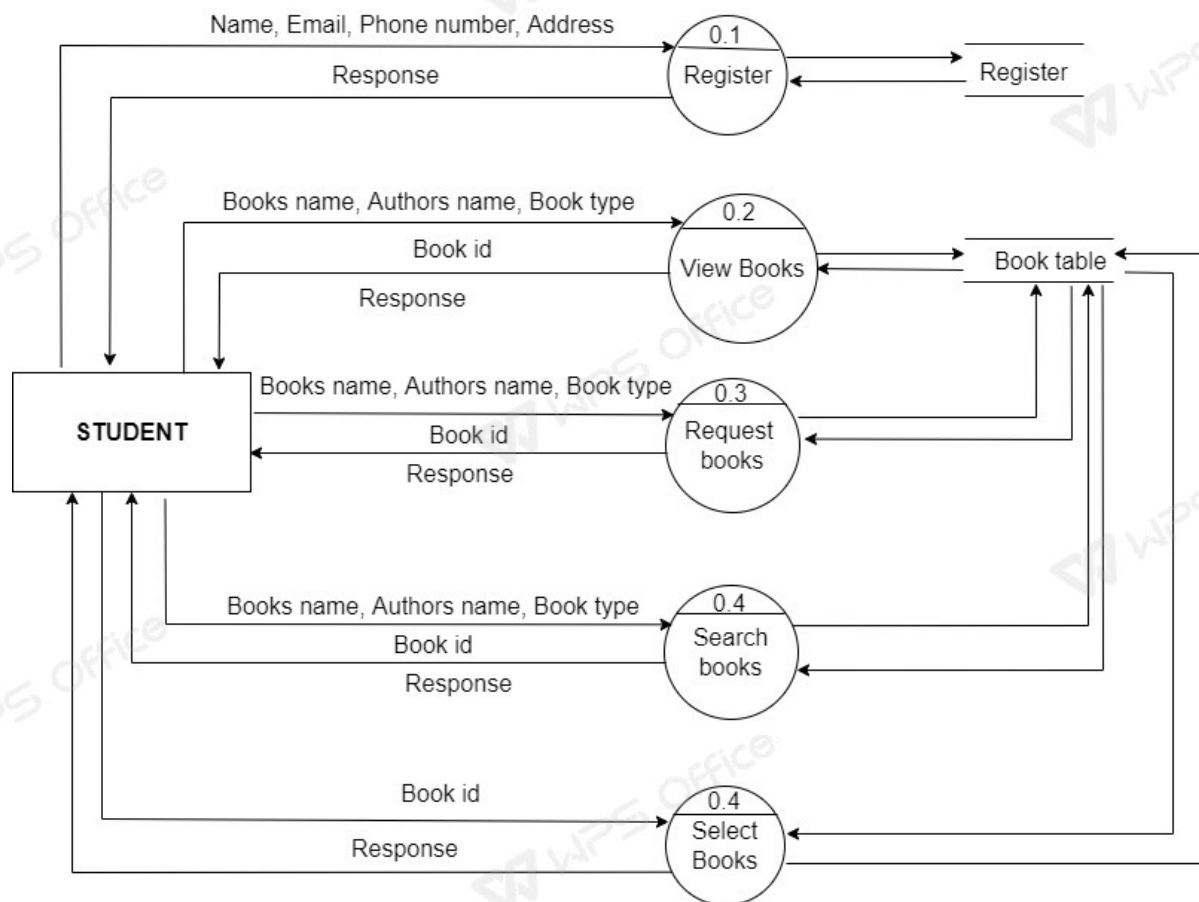
0th Level



1st Level



1st Level STUDENT



2.4.2 ENTITY RELATION DIAGRAM (ER)

Entity relationship diagram is a popular high level conceptual data model. This model and its variation are frequently used for the conceptual design of the database application and many database design tool employ its concepts.

The ER diagram describes data as entities, relationship and attributes:

Entities: The basic object that the ER model represents is an entity which is a thing in the real world with an independent existence. An entity may be an object with a physical existence; it may be an object with conceptual existence.

Attribute: Each entity has attributes, the particular properties that describe it. The attributes values that describe each entity become a major part of the data stored in the database.

Relationship: There are several implicit relationships among the various entity types. In fact, whenever an attribute of one entity refers to another entity type, some relationship exists. The degree of relationship type is the number of participating entity types. A relationship type of degree two is called binary and one of degree three is called ternary.

Cardinality Ratio: The cardinality ratio for a binary relationship specifies the maximum number of relationship instances that an entity can participate in. The possible cardinality ratios for binary types are 1:1, 1: N and M: N.

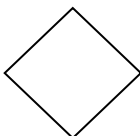
The following diagram diagrams illustrate notation and symbol used to construct ER Diagram.



External Entity

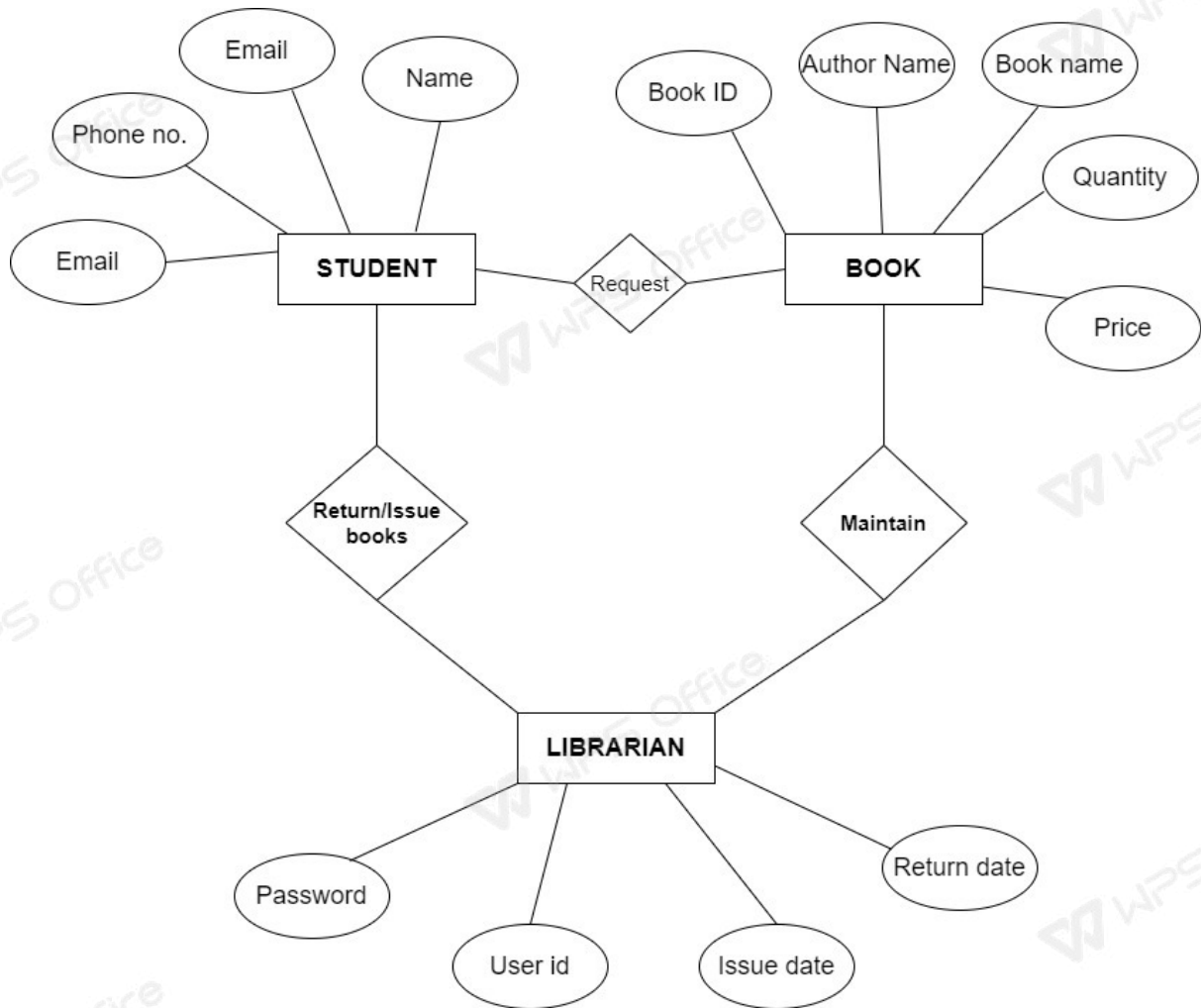


Attribute



Relationship

ER DAIGRAM





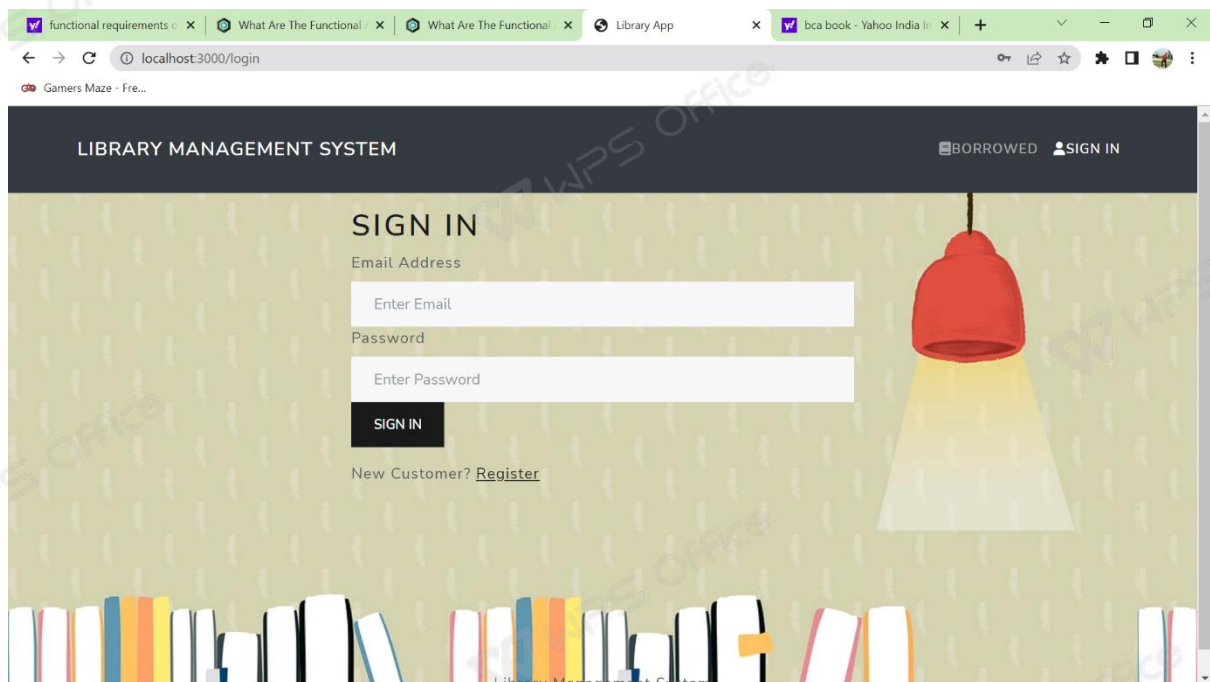
CHAPTER 3: FRONTEND DESIGN

CHAPTER 3 : FRONTEND DESIGN

3.1 INPUT DESIGN

Input design is the process of converting user-oriented inputs to a computer-based formal. The goal is to make the data entry as easy, logical and free from errors as possible. Once the analysis and design of the system has been done, it would be necessary on the part of the programmer to determine and identify the data that are required to be processed to produce the desired results or outputs. Input is one of the most expensive phases of the operations of a computerized system and sometimes creates a major problem. Different types of problems with a system can usually be tracked back to faulty input design method. The input design can also determines whether the user can interact efficiently with the system.

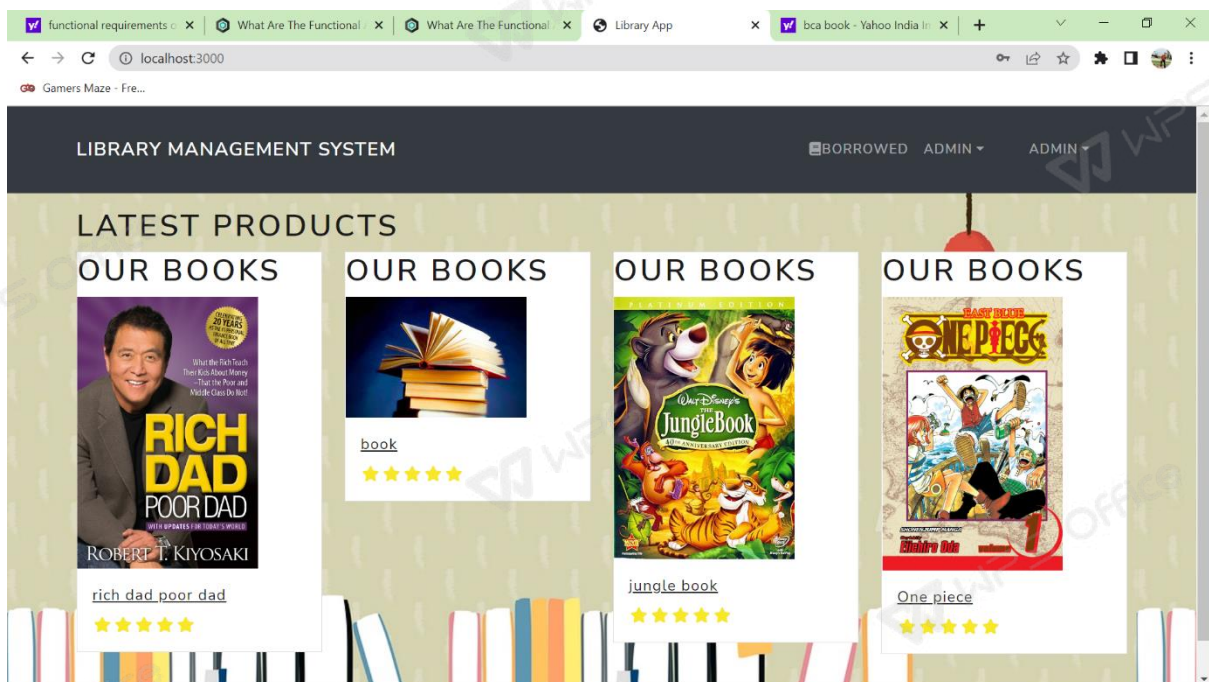
Login page



NEW USER REGISTRATION PAGE

The screenshot shows a web browser window with the URL `localhost:3000/register?redirect=`. The page title is "LIBRARY MANAGEMENT SYSTEM". In the top right corner, there are links for "BORROWED" and "SIGN IN". The main heading is "SIGN UP". Below it, there are five input fields: "Name", "Email Address", "Password", and "Confirm Password". Each field has a placeholder text "Enter [field name]". Below the input fields is a black "REGISTER" button. At the bottom, there is a link "Have an Account? Login". The background features a red lamp and a row of books.

ADMIN DASHBOARD



ADD BOOK PAGE

LIBRARY MANAGEMENT SYSTEM | BORROWED | ADMIN | ADMIN

BOOKS

[+ADD BOOK](#)

ID	NAME	TOTAL QUANTITY	QUANTITY AVAILABLE	CATEGORIES	PAGE COUNT	AUTHORS
62f6237520f38c6756798d3f	rich dad poor dad	2	2	Personal finance entrepreneurship business investing economics	367	Robert T. Kiyosaki and Sharon Lechter
62f628b420f38c6756798dcb	book	1	1	investment	45	dbweb
62f74ebb3cbte0f1e305a95	jungle	2	2	book	199	Rudyard Kipling

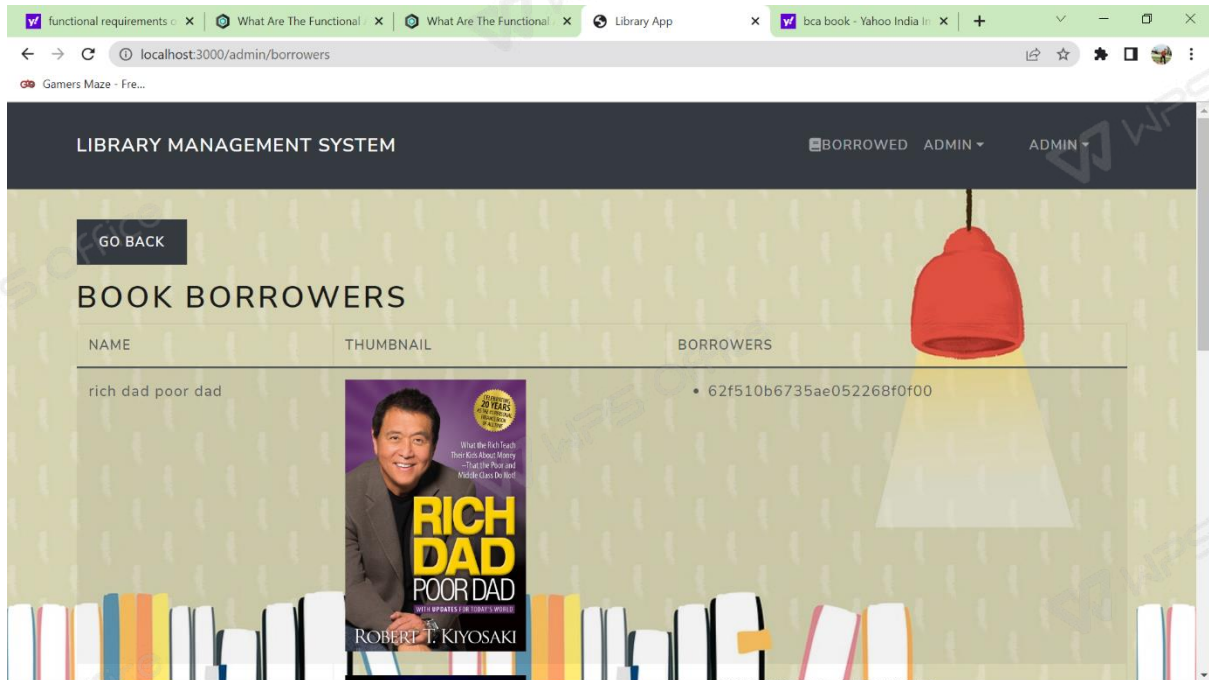
MANAGE USER PAGE

LIBRARY MANAGEMENT SYSTEM | BORROWED | ADMIN | ADMIN

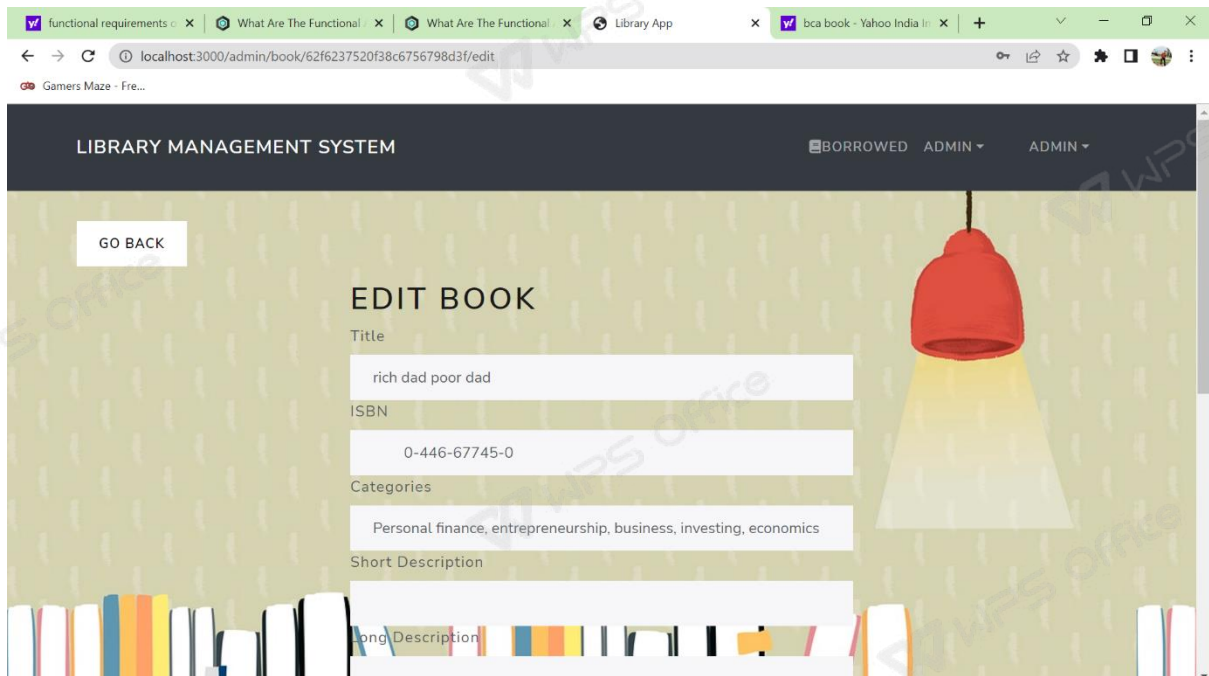
USERS

ID	NAME	EMAIL	ISADMIN
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62f51398788f66b56f0f1345	admin	admin@gmail.com	✓
62f6235020f38c6756798d38	saourabh goala	saourabhgoala@gmail.com	✗

BORROWERS DETAIL PAGE



EDIT BOOK PAGE



EDIT USER PAGE

functional requirements x What Are The Functional x What Are The Functional x Library App x bca book - Yahoo India In x +

localhost:3000/admin/user/62f510b6735ae052268f00/edit

Gamers Maze - Fre...

LIBRARY MANAGEMENT SYSTEM

BORROWED ADMIN ADMIN

GO BACK

EDIT USER

Name

bishal

Email Address

bishalsingh975@gmail.com

☐ Is Admin

UPDATE

Library Management System

USER DASHBOARD

functional requirements x What Are The Functional x What Are The Functional x Library App x bca book - Yahoo India In x +

localhost:3000

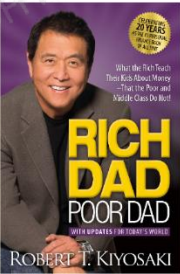
Gamers Maze - Fre...

LIBRARY MANAGEMENT SYSTEM

BORROWED SAOURABH GOALA

LATEST PRODUCTS


OUR BOOKS



rich dad poor dad

★★★★★

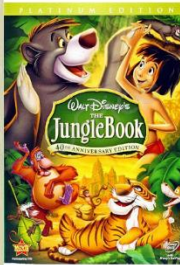
OUR BOOKS



book

★★★★★

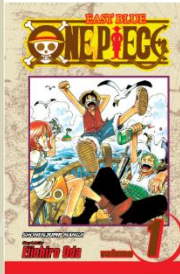
OUR BOOKS



jungle book

★★★★★

OUR BOOKS

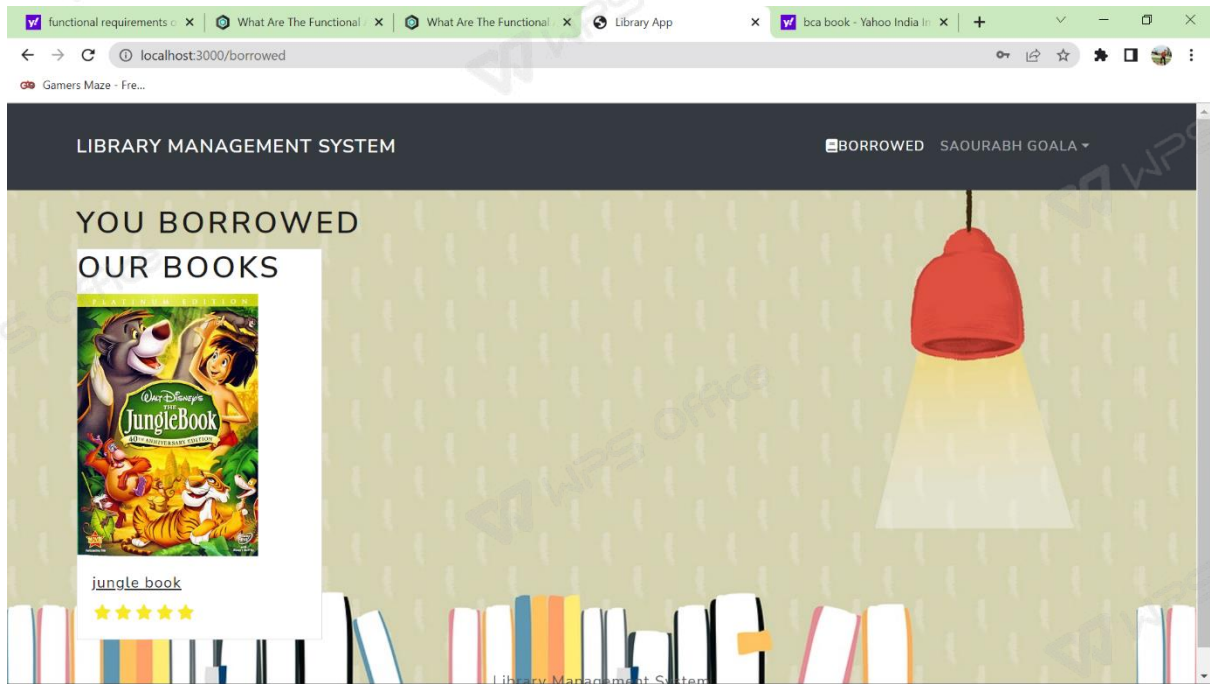


One piece

★★★★★

Library Management System

BORROWED BOOK PAGE



CHAPTER 4: SYSTEM TESTING

CHAPTER 4: SYSTEM TESTING

4.1 UNIT TESTING

Unit testing is performed to test the individual units of software. Since the software comprises various units/modules, detecting errors in these units is simple and consumes less time, as they are small in size. However, it is possible that the outputs produced by one unit become input for another unit. Hence, if incorrect output produced by one unit is provided as input to the second unit then it also produces wrong output. If this process is not corrected, the entire software may produce unexpected outputs. To avoid this, all units in the software are tested independently using unit testing.

The log in function will enable the administrator to log in to the system by proving a valid user-id and password.

Serial number	Test case	Action
1	Empty Email Empty Password	User does not exist
2	Empty Email Entered password	User does not exist
3	Entered Email Empty Password	Incorrect Password
4	Valid Email Invalid Password	Incorrect Password
5	Invalid Email Valid Password	User does not exist
6	Invalid Email Invalid Password	User does not exist

Through VIEW BOOK, admin can update the Books information

SERIAL NUMBER	TEST CASE	ACTION
1	Any field empty	The info will not be updated.
2	All the fields empty	The info will not be updated.
3	All the fields filled	The info will be updated.

Through DELETE, admin can delete the book which they no longer have

SERIAL NUMBER	TEST CASE	ACTION
1	Click on “delete”.	The Books info will be deleted.

Through ADD DOCTOR, admin can add new book in the system.

SERIAL NUMBER	TEST CASE	ACTION
1	Click on “Add Book”.	The list for adding details of book will pop up

4.2 INTEGRATION TESTING

Once unit testing is complete, integration testing begins. In integration testing, the units validated during unit testing are combined to form a subsystem. The integration testing is aimed at ensuring that all the modules work properly as per the user requirements when they are put together that is integrated.

ADMIN

SERIAL NUMBER	MODULE 1	MODULE 2
1	If not logged in to the system	Cannot go the dashboard
2	If not logged in to the system	Cannot add book info
3	If not logged in to the system	Cannot view book info
4	If not logged in to the system	Cannot update book info
5	If not logged in to the system	Cannot view user info
6	If not logged in to the system	Cannot book appointment
7	If not logged in to the system	Cannot view appointment
8	If not logged in to the system	Cannot update user info
9	If not logged in to the system	Cannot delete book info
10	If not logged in to the system	Cannot delete user info
11	If not logged in to the system	Cannot view user profile
12	If not logged in to the system	Cannot logout from the system

4.3 USER ACCEPTANCE TESTING

Acceptance testing is performed to ensure that the functional, behavioral, and performance requirements of the software are met. IEEE defines acceptance testing as a formal testing with respect to user needs, requirements, and business processes conducted to determine whether or not a system satisfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system

CHAPTER 5: FUTURE SCOPE

CHAPTER 5 : FUTURE SCOPE OF THE PROJECT

The future scope of the project includes that what all future enhancements can be done in this system to make it more feasible to use. While developing the software, I have tried my best to fulfill all necessities of the organization. However, there is every possibility of some drawbacks in the software. Those drawbacks can be overcome by further modifying the system by allowing patient to log in to the system and collecting the reports, by this they no longer have to visit the Centre for collecting the reports. Or the admin can just email the reports. Moreover, rest of the need is to change its appearance if a backup system is developed, in order to make it more users friendly.

Some of the extension which can be made later on are :

1. More graphics and design can be added to make it more user friendly and understandable
2. Allowing three different login for user, for student and for admin
3. Admin can approve the borrowing book

CONCLUSION

While developing the system a conscious effort have been made to create and develop a software package. By making use of available tools, techniques and resources an attempt was made to generate a proper system. While making the system, an eye has been kept on making it a user-friendly, cost-effective and flexible in nature. There is a hope that the system will be acceptable to any user and will adequately meet his/her requirements.

Working on this project was a good experience as it taught how important every step is while developing software i.e. starting from collecting user requirements to planning and giving proper coding to each and every design of the project.

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<https://youtu.be/bMknfKXIFA8>

<https://youtu.be/RGKi6LSPDLU>

<https://reactjs.org/docs/create-a-new-react-app.html>

<https://fontawesome.com/v5/docs/web/use-with/react>