

A PROJECT REPORT ON DIGITAL LIBRARY

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Acknowledgment

We would like to pay our gratitude to the Almighty Allah who created us with all the abilities to understand analysis and develop the process with patience. We would like to take this chance to express our sincere gratitude to our Teacher which is Aditya Rajbongshi, Lecturer helped us a lot throughout the project development. When we still doing nothing while project due date is getting close, Sir give us some pressure to complete the system. Without him, we think we can't finish the system on time. In addition, while we meet some logic problem or design problem, Sir always the one give me useful and logic answer. we would like to thanks Aditya Rajbongshi for one more time because he share his experience with us so that we can get more logic understanding on how to develop a software which suitable for the current society. Last but not at least, we would like to acknowledge our course-mates as they has assisted us no matter in coding or logic design. When we met some coding problem, they are the one who always teach us with their understanding in programming.

Abstract

As online system is gaining more importance as the number of its users are increasing rapidly. Our website "Digital Library" is also online based , where user can suggest their desired books also download any books they find interesting. This website provides variety of features like -download,search ,feedback,authentication and a secure admin panel. The transactions like login, register, add , search, delete, issue are also provided. Our database stores the details like email,password,books title,book author name,price of the book ,picture of the book and a PDF related to that book. The admin panel provides a clean interface and an easy form system where admin or librarian can easily add,edit or delete books .The website also provides a secure route to the admin panel ,this is so that not any normal user can go to the admin panel simply just typing the URL of the admin panel.If any third party user try's to go to the dashboard then they will be sent back to the admin panel. This website contains some extra features such as a subscription page, a book details page,a related books page and many more. We tried to maintain a clean UI/UX user experience as much as possible with the right kind of color combination and many more. Moreover,Our website is responsive and meets the current trend of digital online websites. User can give their feedback using the feedback system and their feedback will be recorded in the database. As this is a online based website so everything has to be online and up to date. We build this website using REACT framework for front-end and NODE.JS for back-end. Everything that our website brings is relate to the database such as-Books,PDF, images and so on. Normal user has their own database and admin as well as librarian has their own database. Different database was connected via foreign key which was a crucial task for us. We have a subscription page for users and a login page where they can subscribe and sign up. And we have a admin sign up page which is not available for normal user and only admin or librarian can go to that page.

Declaration

The project submitted herewith is a result of our own efforts took some help from honorable Teacher in totality and in every aspects of the project works. All information that has been obtained from other sources had been fully acknowledged. I understand that any plagiarism, cheating or collusion or any sorts constitutes a breach of College rules and regulations and would be subjected to disciplinary actions.

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Dedication

*Dedicated to our parents, teachers, friends and who loved us for all their love
and inspiration.*

Certificate

This is to certify that Asraful islam (ID-18192103070) S M Masfequier Rahman Swapno(18192103087) Shoheb Nur Asif(ID-18192103082, Rasel mahmud (ID-18192103086), were belong to the department of Computer Science and Engineering, We are Still Studying,Currently working on Library management System.

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Chapter 1

INTRODUCTION

1.1 Introduction

A digital library is an integrated set of services for capturing, cataloging, storing, searching, protecting, and retrieving information, which provide coherent organization and convenient access to typically large amounts of digital information. Digital libraries are realizations of architecture in a specific hardware, networking, and software situation, which emphasize organization, acquisition, preservation, and utilization of information. This volume describes an open architecture for the development of a Digital Library System. The many users of such a system, even those with only limited or even no knowledge of information technology can benefit enormously from quick and easy access to the information it contains. Its initial users will be drawn from the research community[1]. However, the system is designed to accommodate a broad class of users (researchers and all others) in productive use of the digital library. The Digital Library System design allows individual organizations to include their own material in the Digital Library System or to take advantage of network-based information and services offered by others. It includes data that may be internal to a given organization and that crosses organizational boundaries. This document presents a plan to develop such a system on an experimental basis with the cooperation of the research community. Finally, it addresses the application of a Digital Library System to meet a wide variety of user needs.

1.2 Motivation

With the advancement of information and communication technology, the rate of information explosion increases exponentially. Library digitization is nothing but the conversion of physical media of the library, i.e. books, periodical, articles, etc., into digital format (0 and 1 bit). Bits are the fundamental units of information in a computer system. Flexibility is one of the chief assets of digital information. As a result, libraries have been constantly facing the problems of space, escalation in the cost of books and journals, budget shrinkage, inability to provide multiple copies and most important is retrieval efficiency of user being endangered for want of information. The digital library contains digital representation of the object found in it. Digital library is popularly viewed as an electronic version of a library. To some extent, it simply means computerization of traditional libraries. According to Larson, defined the digital library as global virtual library - the libraries of thousands of “networked electronic libraries.” Networked electronic libraries describe the collection of various library resources to the network so that any user can access the resources anytime in anywhere.

1.3 Current System

One of the largest issues in creating digital libraries will be the building of digital collections. Digital imaging is an inter-linked system of hardware, software, image database, and access sub-system with each having their own components. Tools used for the digital library include several core and peripherals systems like hardware (such as scanners, computers, and data storage), software (image capturing and editing), network (data transmission), and display/printing technologies [2]

1.4 Problem with the Current System

Some of the important points to be considered in developing a digital library are as follows:

- a. Digital collection - There are essentially three methods of building digital collections:
 - (i) Digitization, converting paper and other media in existing collections to digital form
 - (ii) Acquisition of original digital works created by publishers and scholars. Example items would be electronic books, journals, and datasets.
 - (iii) Access to external materials not held in-house by providing pointers to websites, other library collections, or publishers' servers.
- b. Access to external digital collection - The digital libraries can obtain access permission to digital collection provided by external sources like institutions, resources of the libraries, electronic journal through on-line access , which provides their journals on-line through websites.
- c. Access to digital information available on the web - WWW is the repositories of information and one of the important services of the internet.

1.5 Proposed System

To develop information systems providing access to a coherent collection of materials, which will be in digital format and enable full utilization of the opportunities that are offered by the materials available in digital formats. Helps in the reduction of physical storage of information, consequentially lessens wear and tear of the materials.

Our website "Digital Library " focuses on these issues mentioned above. First of all, We solved the digitization problem by using database and this helped us to convert paper and other media in existing collection of digital form.Moreover ,using a database system also helped us making connection with other publishers and scholars.Most importantly we don't have to go to an external source to get our book or PDF .In our website journals can upload their work.Since our website is hosted online anyone can visit our website and get the services. [3]

1.6 Project Overview

Digital Library 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 add new books, videos and Page sources. 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 [2]

1.7 Project Scope

At here, I will describe my friend's part which is library website which used by librarian and member.

1.7.1 Authorization and Authentication Module

This module is used by user and also admin user for the website. They need to login to the website using their id and password. In order to distinguish the user's level, user can access to different module when successfully login. For example, admin can implement News

1.7.2 Member/Staff Maintenance Module

This module allows user and also admin to view their profile. Not only that, they allow to edit their profile and also change their password.

1.7.3 Search Module

Search module allow user or guess who visit website to search the book. Not only that the user allow viewing the detail of the book and also seeing the comment of the book. There are

a few of type allow users to search. They can search via ISBN, book title, author, publisher, and category.

1.7.4 Top 5 new book and recommended book Module

Top 10 new book modules allow guess and member to see the top 10 new book has brought by the library and the recommended book module only can see by member after log in to the system. It recommended based on their category example the user like to see action type book then it will recommend some action book for

1.7.5 News Maintenance Module

This module allows user to add, edit and delete the news. So when the users visit the website the website will have shown updated news

1.7.6 Book Maintenance Module

Book maintenance module allows the member to view the book currently they have borrowed and also view the book they have borrowed. Not only that, there got reservation module which allow member to reserve book. Members are allowing reserving book and deleting the reservation and also view currently the book they reserve.

1.7.7 E-mail Module

E-mail module has implemented in FAQ and also forget password. So when the member forgot their password they can get back their password via matching their ID and E-mail. Other than that, for FAQ if guess or members have more questions to ask they can ask via E-mail

1.7.8 Report Module

Report module is the module for admin user. There is two report which is Book Comment and Member Expired. For Book Comment report is to view the top book that has been commented. It allows the admin to know the popularity of the book so that they can get more new books. It can view via day, month and year. Member Expired report is to view the member is expired

via which date, month or year. So they can remind their member to renew the membership and also can know the popularity of the library. So, it can be estimate the popularity of the library currently is increasing or decreasing

1.7.9 Comment Module

Comment Module created is for member to comment a book. So, if the member have opinion about the book they can actually comment on the book. Not only that they can also delete their own comment. Admin users can delete any comment of the book that member has already comment.

1.8 Aims and Objectives

The project aims and objectives that will be achieved after completion of the system were carried out in this sub chapter. The succession of the system also will be evaluated through this sub chapter. The project objectives are:

- Online book reading.
- - To eliminate the paper-work in library
- - To record every transaction in computerized system so that problem such as record file missing won't happen again.
- - To implement Bar-Code, SMS technologies into the system.
- - To design a user friendly graphical user interface which suit the users.
- - To complete the system according to project schedule
- - To produce technical report that documents the phases, tasks and deliverables in the project
- A search column to search availability of books.
- Facility to download required book.

- Video tutorial for students.
- An Admin login page where admin can add books, videos or page sources
- Open link for Learning Websites

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The library which is the gate of the Knowledge should be supported by the existence of an adequate information system, to provide excellent service and optimal to every user. Digital Library needs to be re-evaluated so that the system can meet the needs of both operator and User user in particular, and users from outside User in general. This study aims to evaluate and improve the existing library management system to produce a system that is accountable and able to meet the needs of end users, as well as produce a library management system that is integrated User. Research is directed to produce evaluation report with Technology Acceptance Model (TAM) approach and library management system integrated with the national standard.

[?]

2.2 Security

Security is a must for any website .Without any security any militia's user can hack into the system and cause serious damage. With that in mind we used many security features such as -Protected route and user authentication system which plays a vital role in our website. We took reference from many website and some feature we liked and some we thought needed some improvements.

2.2.1 Encryption and Decryption

Authentication is a must for any secured system. We used data encryption system to convert our users information to hex .This is used so that if by any chance some hacker gets access to our database they can not get information ,since decryption the hashed information is not easy and very time consuming.

Now, as for Decryption we used a node package manager called "**bcrypt**".This module can easily encrypt and decrypt information with the correct setup.

2.2.2 Protected Route

Protected Route is used to prevent normal user or any other user from accessing the database via URL .Only by signing up admin can go to the database.And if they try otherwise then they will be redirected to the admin sign up page.

2.3 Technological components

2.3.1 Digitization Process

The digitization process involves three main steps i.e., Selection, Conversion and Preservation.

4.1. Selection

The process of selection of material for digitization involves identification, selection and prioritization of documents that are to be digitized. The documents should be selected for conversion based on the criteria viz. Content, demand, condition and type of document.

4.2. Conversion

It involves following steps

4.3. Data Capture

The data can be captured by manual data entry, Imaging with scanners or digital camera and doing OCR (Optical Character Recognition). Electronic scanners are used for scanning of an electronic image into a computer through its original that may be a photograph, text, manuscript, etc.

4.4. Data Processing

Quality control is an important component in every stage of a digital imaging project. The captured data have to be processed in order to image enhancement, amplification, compression and to remove the noise in OCR processing. For this purpose special software can be used.

4.7. Retrieval and Display

Typically, digital library software use database management system at the back-end, sophisticated search engines and user-friendly search interfaces as front-end to facilitate search and browsing of resources available in a digital library. Users are also allowed to refine their search strategy. Once the required images have been identified their associated document image can quickly be retrieved from the image storage device for display or printed output.

4.8. Preservation

The process of maintaining materials produced in digital formats in a condition suitable for use is a real challenge. Problems of physical preservation are compounded by the obsolescence of computer equipment, software and storage media. Migration, Replication, Emulation, Refreshing, Metadata Attachment, Trustworthy digital Objects, Normalization, Bit stream Copying, Technology Preservation, Digital Archaeology, Analog Backups, Encapsulation etc. are the digital preservation strategies used in digital libraries.[4]

2.4 Algorithm/Methodology

We had chosen Agile Methodology for Our project. The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. Continuous collaboration is vital, both with team members and project stakeholders.

2.4.1 It saves Time

Time is of the essence for both librarians and patrons. The librarian can easily record and go through the history of individual library users. On the other hand, the library users can know

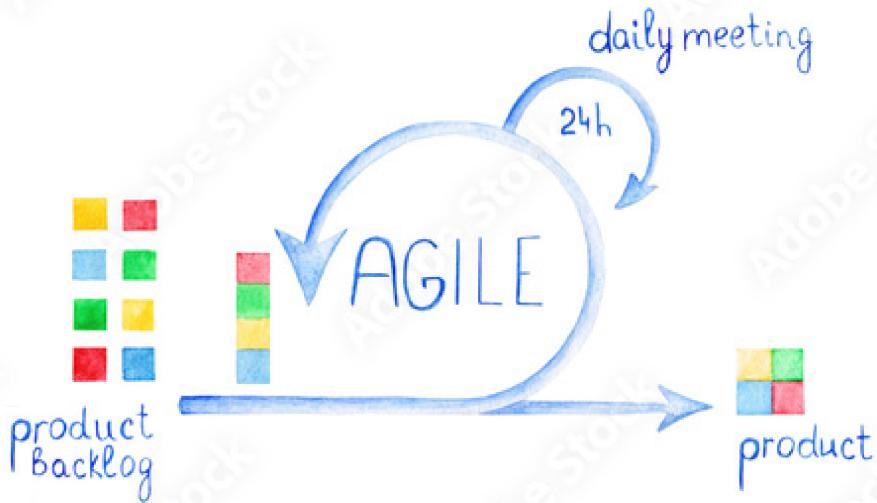


Figure 2.1: Agile Methodology

the location and availability of a particular book faster than before. Both the librarian and the student can accomplish more with less time.

2.4.2 It enhances The presentation of the library

A library should be as much about the looks as it is about the books. A library with a good management system looks tidy and attractive. The librarians can arrange the available books in good order, while the students can locate them easily. It, therefore, increases the comfort and enjoyment of the librarians and the library users.[5]

2.4.3 Mobile Access

The Digital library management system provides mobile access to search the library catalog, schedules, books and resources from anywhere, at any given time via smartphones and tablets

2.4.4 Efficient Cloud management Data

Automate, simplify and deploy library database seamlessly to make it easy for your institution to benefit from secure cloud services. Improve efficiency with the automation of various library tasks including acquisition, cataloging, serials management, circulation and reference.

2.4.5 Highly Secure ,scalable and Reliable

College libraries benefit from scalable infrastructure, role-based secure access, high performance and reliable to ensure seamless access to library database.

2.4.6 Innovation,Cost Effective and Fully Customizable

Students can search, write articles, upload photos and videos, manage email, send messages, but also help them to keep up with the librarian and other students via chat, discussion forums, and social media.

Embracing sophisticated technologies is cost-effective and a viable choice for education institutions. Using cloud, mobile and digital libraries eliminates paper-based processes and maintenance overheads, improves productivity, reduces operation costs and saves time.

The library automation system is fully customizable and adaptable to the needs of educational institutions to provide fast, reliable data.

Chapter 3

REQUIREMENTS ANALYSIS

3.1 Introduction

Requirements Analysis is the process of defining the expectations of the users for an application that is to be built or modified. ... High-quality requirements are documented, actionable, measurable, testable, traceable, helps to identify business opportunities, and are defined to a facilitate system design.

3.2 Requirements Analysis

In this chapter, we will discuss and analyses about the developing process of Library Management System including Software Requirement Specification (SRS) and Data Flow Diagram (DFD).The functional and non-functional requirements is included in SRS part to provide complete description and overview of system requirement before the developing process is carried out. Besides that, DFD provides a view of how the system or business flows that able to increase the efficiency and effectiveness to achieve system objectives.

3.2.1 NON FUNCTIONAL REQUIREMENTS

EFFICIENCY REQUIREMENT

When a library management system will be implemented librarian and user will easily access library as searching and book transaction will be very faster

RELIABILITY REQUIREMENT

RELIABILITY REQUIREMENT The system should accurately performs member registration ,member validation , report generation, book transaction and search

USABILITY REQUIREMENT

The system is designed for a user friendly environment so that student and staff of library can perform the various tasks easily and in an effective way

IMPLEMENTATION REQUIREMENTS

In implementing whole system it uses HTML in front end with php as server side scripting language which will be used for database connectivity and the back-end ie the database part is developed using mysql.

DELIVERY REQUIREMENTS

The whole system is expected to be delivered in six months of time with a weekly evaluation by the project guide

3.2.2 FUNCTIONAL REQUIREMENTS

Mormal User:

USER LOGIN

This feature used by the user to login into system. They are required to enter user id and password before they are allowed to enter the system .The user id and password will be verified and if invalid id is there user is allowed to not enter the system.

Functional requirements

- user id is provided when they register
- The system must only allow user with valid id and password to enter the system

- The system performs authorization process which decides what user level can access to.
- The user must be able to logout after they finished using system

REGISTER NEW BOOK

This feature allows to add new books to the library

Functional requirements

- system must be able to verify information
- system must be able to enter number of copies into table
- System must be able to not allow two books having same book id.

SEARCH BOOK

This feature is found in book maintenance part . we can search book based on book id , book name , publication or by author name

functional Requirements

- - System must be able to search the database based on select search type
- - System must be able to filter book based on keyword entered
- System must be able to show the filtered book in table view

3.3 Hardware Requirement Analysis

- Operating system- Windows 7 is used as the operating system as it is stable and supports more features and is more user friendly
- Database MYSQL-MYSQL is used as database as it easy to maintain and retrieve records by simple queries which are in English language which are easy to understand and easy to write

- Development tools and Programming language- HTML is used to write the whole code and develop web pages with css, java script for styling work and php for sever side scripting.

3.4 Software Requirement Analysis

- Intel core i5 2nd generation is used as a processor because it is fast than other processors and provide reliable and stable and we can run our pc for longtime. By using this processor we can keep on developing our project without any worries
- Ram 1 gb is used as it will provide fast reading and writing capabilities and will in turn support in processing.

3.4.1 Server

MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.

3.4.2 Framework-Material UI

Material-UI is simply a library that allows us to import and use different components to create a user interface in our React applications. This saves a significant amount of time since the developers do not need to write everything from scratch



Figure 3.1: MUI

3.4.3 HTML

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. ... HTML elements are the building blocks of HTML pages.



Figure 3.2: HTML

3.4.4 CSS

Cascading Style Sheets 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



Figure 3.3: CSS

3.4.5 SCSS

Sass is a preprocessor scripting language that is interpreted or compiled into Cascading Style Sheets. SassScript is the scripting language itself. Sass consists of two syntaxes. The original syntax, called "the indented syntax," uses a syntax similar to Haml.



Figure 3.4: SCSS

3.4.6 REACT

React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta and a community of individual developers and companies. React can be used as a base in the development of single-page or mobile applications.

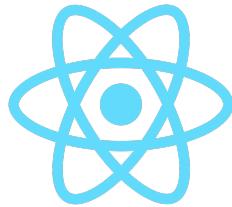
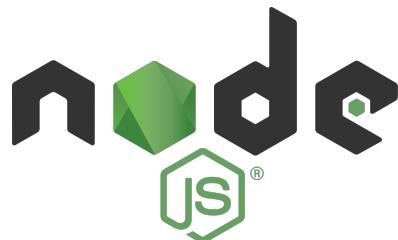


Figure 3.5: REACT

3.4.7 NODE.JS

Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser.

Figure 3.6: NODE_cJS

3.4.8 Database

In computing, a database is an organized collection of data stored and accessed electronically from a computer system. Where databases are more complex they are often developed using formal design and modeling techniques

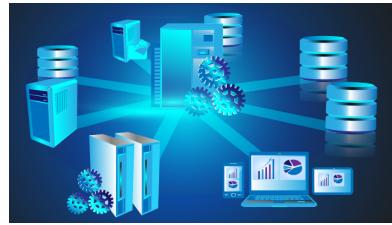


Figure 3.7: DATABASE

3.5 Feasibility Study

A feasibility study is an analysis that considers all of a project's relevant factors—including economic, technical, legal, and scheduling considerations—to ascertain the likelihood of completing the project successfully. Key Features :

- (i) Provides access to a very large collection of information.
- (ii) Supports multi-media content.
- (iii) Network accessible
- (iv) Provides user-friendly interface.
- (v) Unique referencing of digital objects
- (vi) Supports advance search and retrieval.
- (vii) Information available for a very long time.
- (viii) Supports traditional library missions of collection development, organization, access and preservation of information.
- (ix) Supports editing, publishing annotation and integration of information.

3.5.1 Technical Feasibility

Searching Process

The catalogues are prepared for searching the materials in the library, but these are not fully capable to search out the required material out of large chunk of the literature

To provide the answer to various types of queries, the entries prepared to provide access to the users are filled. The search for a record of a document may be done for various types of access searching through the access points such as author, title, subject, class, and key words, accession numbers etc.

It ensures a sure success of information retrieval. Browse facility allows the user to consult the catalogue of a library.

Internet facility has become essential for every library in the modern age of technology. Babaria Institute Library is well equipped with this facility. The Internet services of web browsing, email, etc. are connected to the campus LAN.

3.5.2 Financial Feasibility

A financial feasibility study should be conducted at the onset to determine the economic viability of a proposed venture before proceeding to the preparation of a business plan. It identifies the startup costs, makes projections of profits and cash flows and determines the return of the investment.

The preparation of a financial feasibility study has three parts:

- Determining the startup costs.
- Preparing a profit plan and making cash flow projections.
- Assessing the return on invested capital.

A feasibility study isn't a business plan. A feasibility study is intended to determine if the proposed venture is a profitable idea.

A business plan is a detailed plan on how the venture will be implemented and managed successfully.

Our project building cost estimates to be around 50000tk.

Team management and external cost is around 40000tk.

Profits is estimated to be around 20000tk.

The budget of our Clint is 120000tk.

So our project is financially feasible.

Chapter 4

SYSTEM ANALYSIS AND DESIGN

4.1 Introduction

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. 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. Analysis specifies what the system should do.

It is a process of planning a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements. Before planning, you need to understand the old system thoroughly and determine how computers can best be used in order to operate efficiently. system Design focuses on how to accomplish the objective of the system.

4.2 System Architecture

The system architecture is rationalized relative to the operational and technical architecture. It is desirable, to concern, system properties such as scalability and extensibility can be taken into account at the system architecture level. At this level whole digital library system is kept in mind. It can be said that DL is a centralized subsystem that interacts with variety of data producers and customers within a complex distributed system

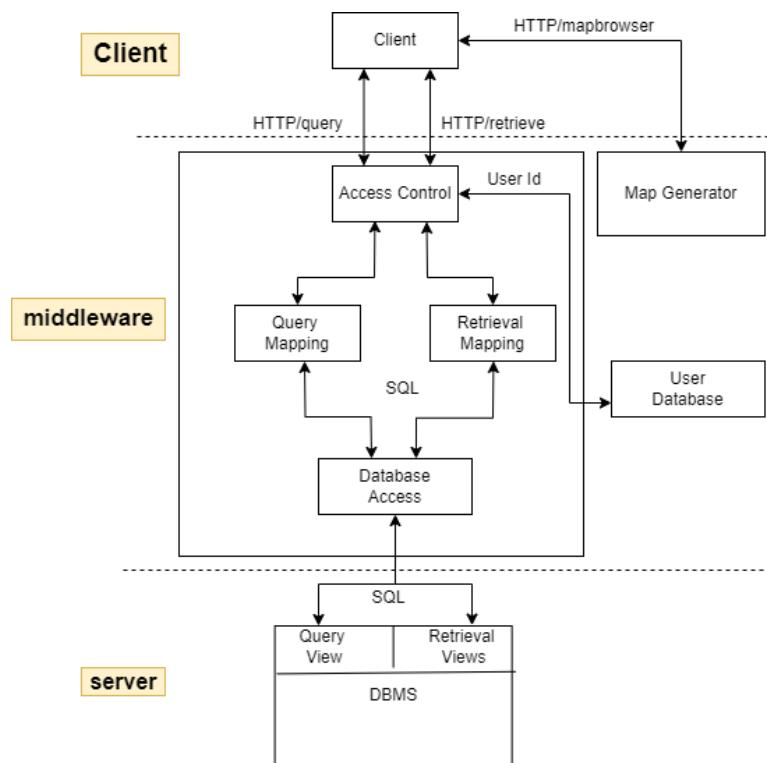


Figure 4.1: Architecture of Digital Library

4.3 Flowcharts/DFDs/ERDs

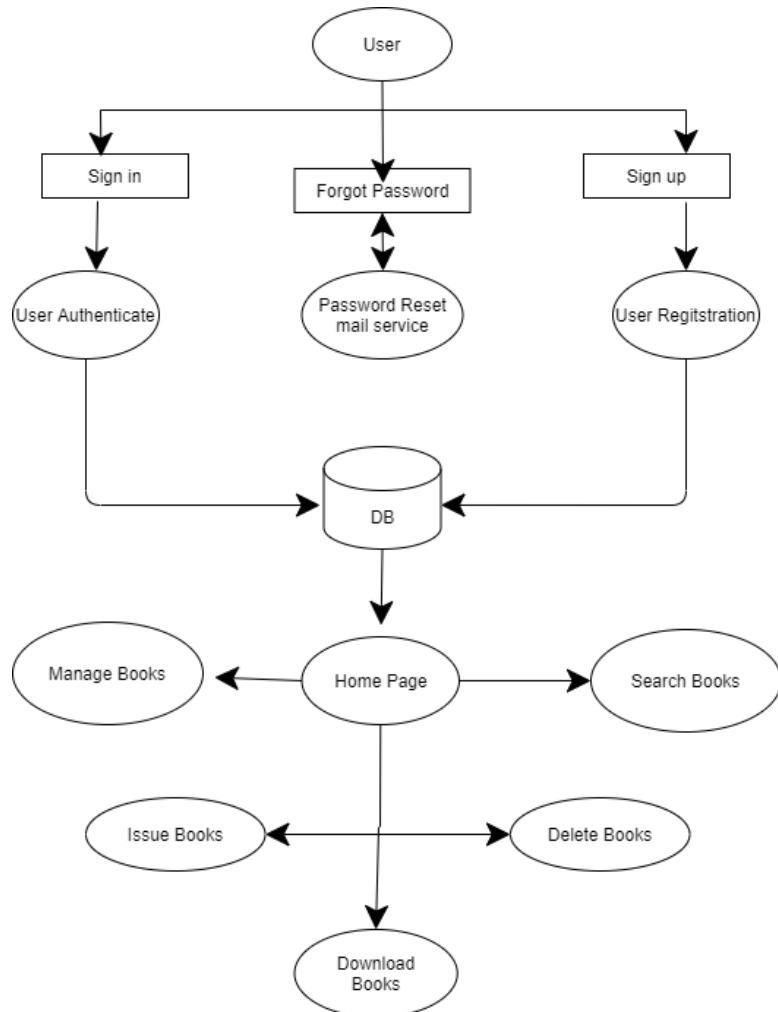


Figure 4.2: Flow chart

The flowchart above shows that a user can either sign up or sign in and if he/she forgets their password then they can get their password via their mail. In our database admin can add, edit, delete books and issue new books if there is any feedback regarding that. User can also download pdf.

4.4 DFDs

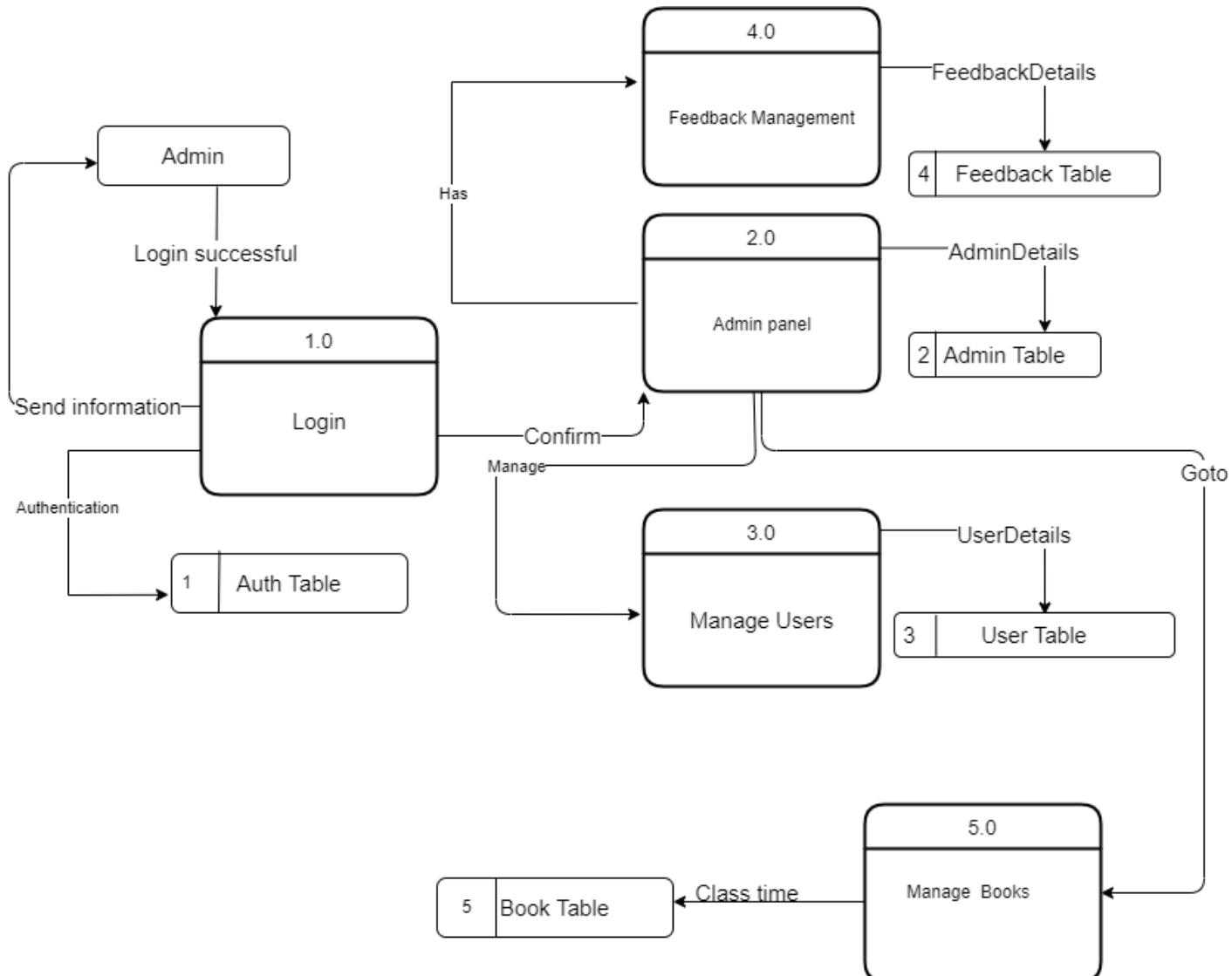


Figure 4.3: Level2 DFD

The level 1 data-flow diagram provides an overview of the system. As the software engineers' understanding of the system increases it becomes necessary to expand most of the level 1 processes to a second or even third level in order to depict the detail within it. Decomposition is applied to each process on the level 1 diagram for which there is enough detail hidden within the process. Each process on the level 2 diagrams also needs to be checked for possible decomposition, and so on.

From the DFD above we can see that the DFD has five process and five database table regarding those process. The processes works like this:-

- First Admin logs in using their email and password and if it matches or confirms then go to Admin panel.
- Then From The Admin panel admin can read the feedback which is connected to feedback table .
- They can also manage books as well as manage the users currently stored in the database.

4.5 ERDs

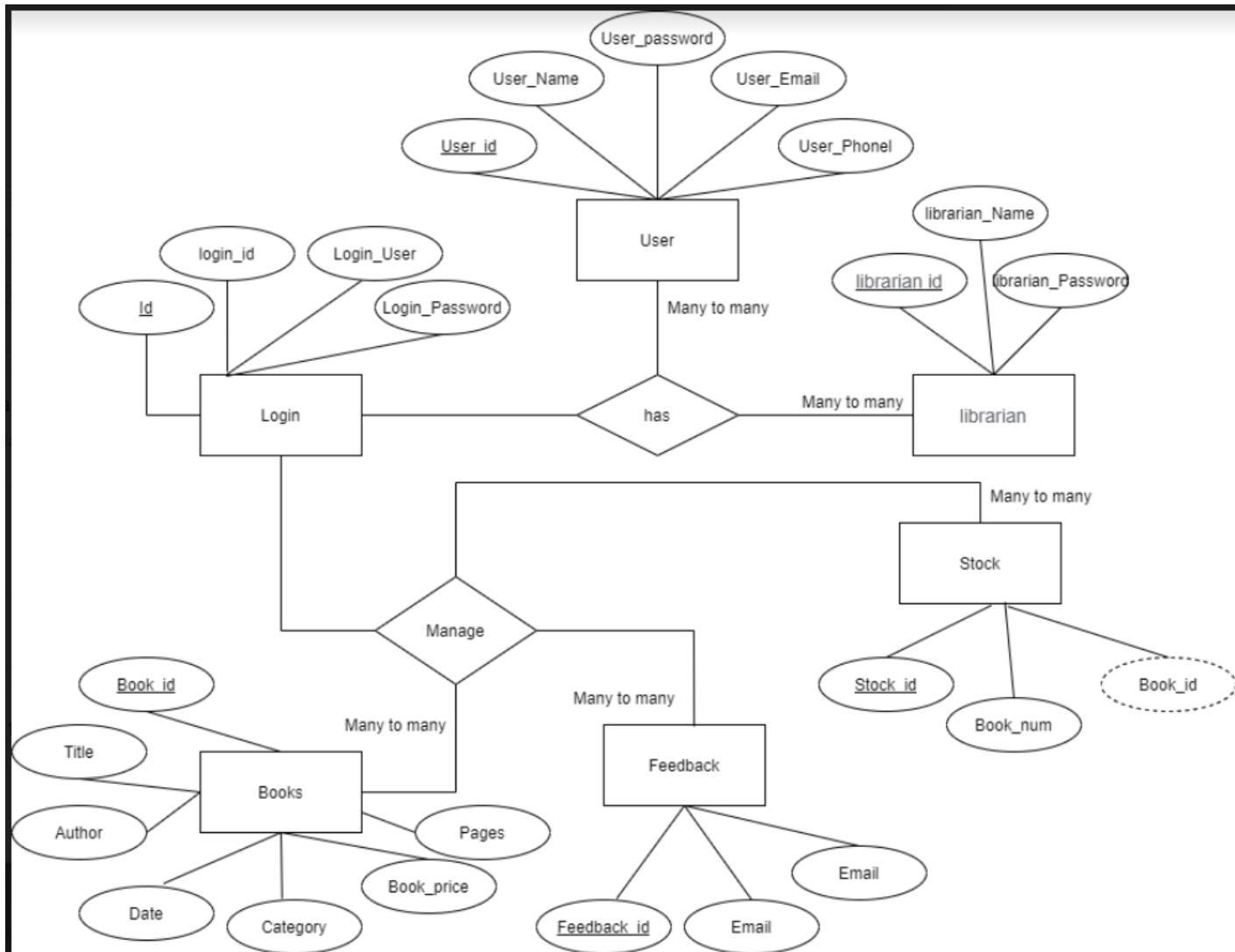


Figure 4.4: ER Diagram

The figure above shows the ER diagram of our system. Here we can see all the attributes

of different entity and their primary key as well as the foreign key that is the primary key of another entity. Each entity has their individual primary key and their relations are many to many relation as we can see.

4.6 Use Case Diagram

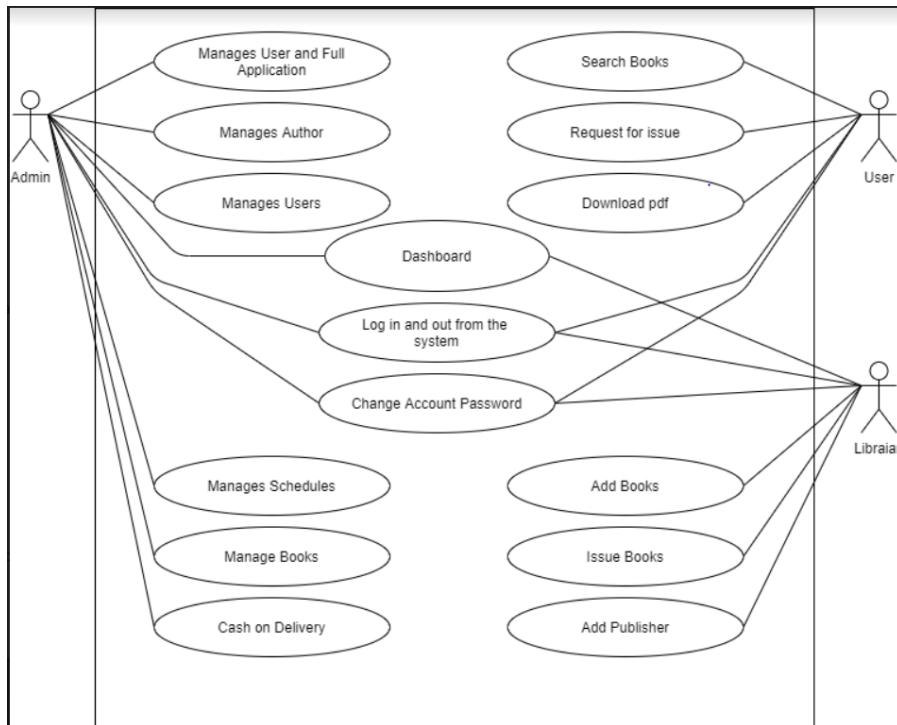


Figure 4.5: Use Case Diagram

In the above use case diagram we can see a admin and a user and a librarian. The admin can manage books as well as manage user .Admin has control over the full application. As for librarian he/she can only issue books . One the other hand , user can only download pdf and search book that is in the database.User can give their feedback and admin or librarian can see that and improve their services.

4.7 Design

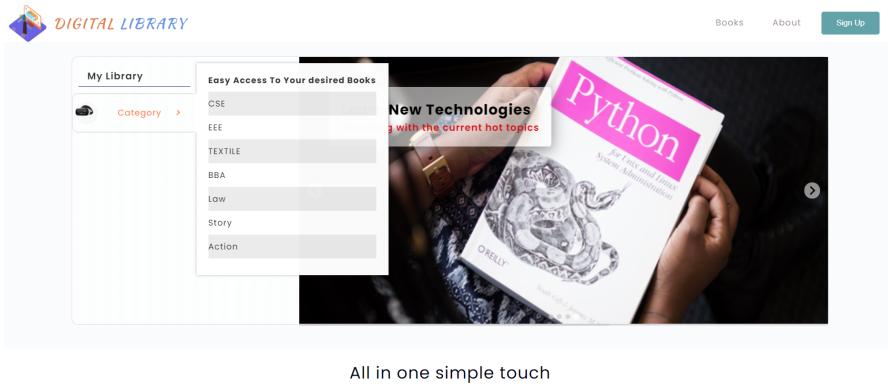


Figure 4.6: Home Page

This is the home page of our application. User can signup/login and navigate to different pages from here. This page is the bottom page of our home page .user can navigate to the subscribe page using the subscribe button.This page also contains the footer of our application. This page is our books page .Here we can see all the books currently available in the

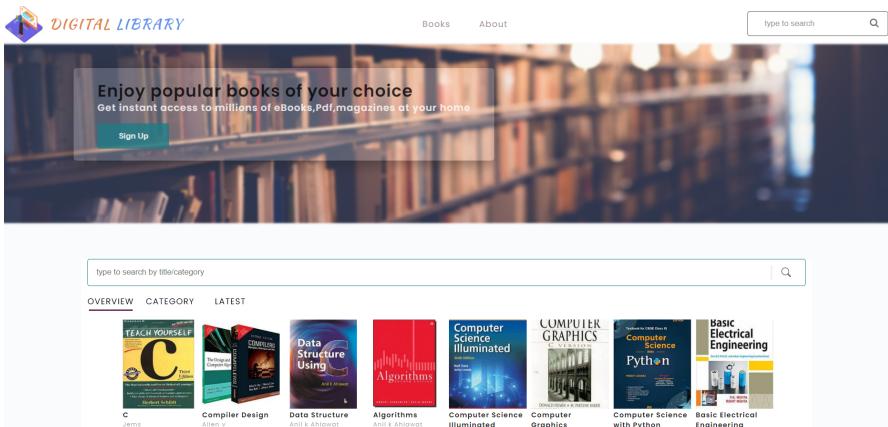


Figure 4.7: Book

database.User can click on any book and they will be taken to that book details page.

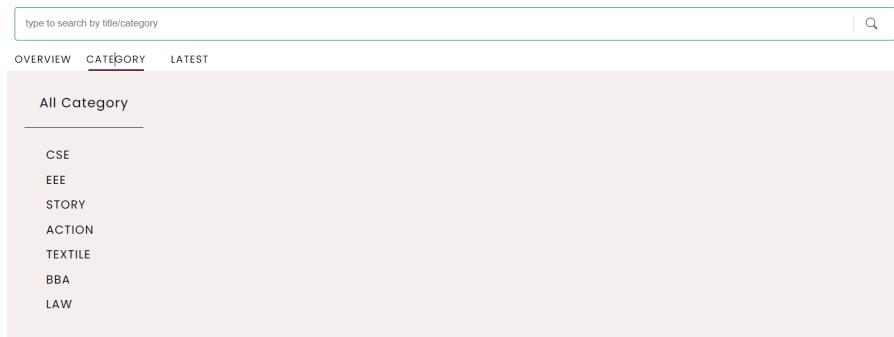


Figure 4.8: Book

This is a category navbar which shows all the category of book that are present in our database. This page contains all the information that a book contains. A user can download

A screenshot of a book details page. At the top left is a "DIGITAL LIBRARY" logo. At the top right are links for "Books", "About", and a "Sign Up" button. The main content area shows a book cover for "TEACH YOURSELF C Third Edition" by Herbert Schildt. To the right of the cover, the letter "C" is displayed, followed by "Written by JEMS" and "Category CSE". Below this is a "Description" section with placeholder text. At the bottom of the book cover section are two buttons: "View Pdf" and "Download". Below the book cover, there is a "About the author" section featuring a profile picture of "Jems" and a short bio.

Figure 4.9: Book Details

the book using the download button .

A screenshot of a books details page. At the top left is a "Related to Category" section. Below it is a "Related Books" section displaying six book covers: "TEACH YOURSELF C", "Compiler Design", "Data Structure Using C", "Algorithms", "Computer Science Illuminated", and "COMPUTER GRAPHICS". At the bottom of the page is a footer with several links: "About", "Support", "Legal", "Social", and "Language English". The "About" section includes links for "About Digital Library", "Join us", and "Contact Us". The "Support" section includes links for "Help/FAQ", "Accessibility", and "Publishers". The "Legal" section includes links for "Terms", "Privacy", and "Copyright". The "Social" section includes links for "Facebook", "Twitter", and "LinkedIn". At the very bottom of the page is a copyright notice: "Copyright © 2021 Digital Library Inc."

Figure 4.10: Books Details

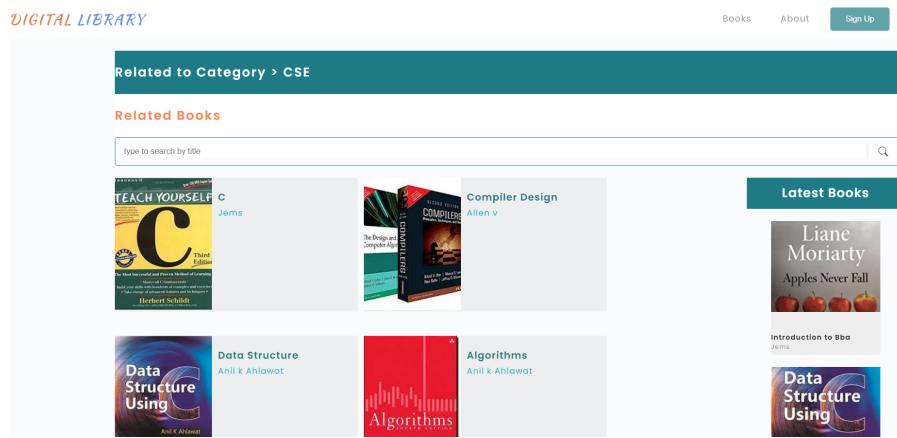


Figure 4.11: Related Category

This page contains all the books that is stored and matches the category items of selected category. Here user can see the latest five books that were added.

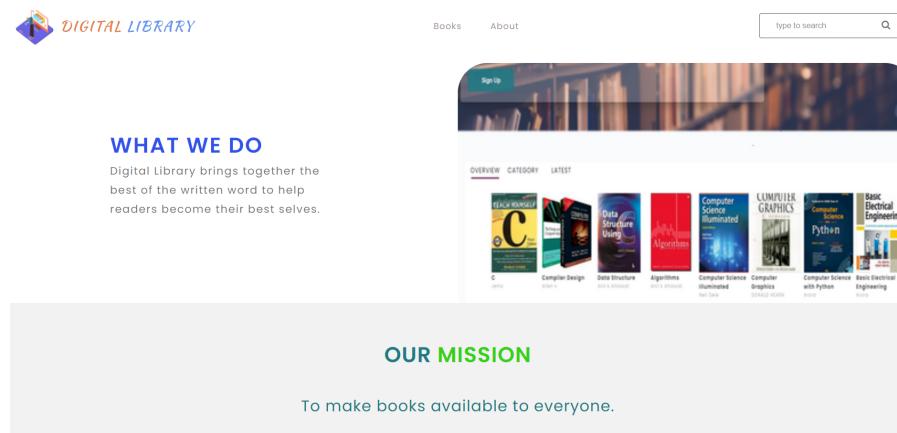


Figure 4.12: About

This page contains our mission and core value for building this application.

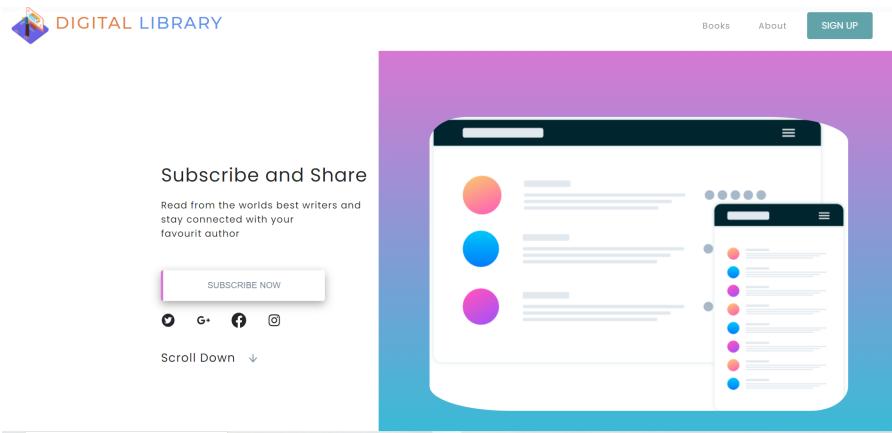


Figure 4.13: Subscription

This is the subscription page of our application. User can click on the subscribe page and get monthly benefits.

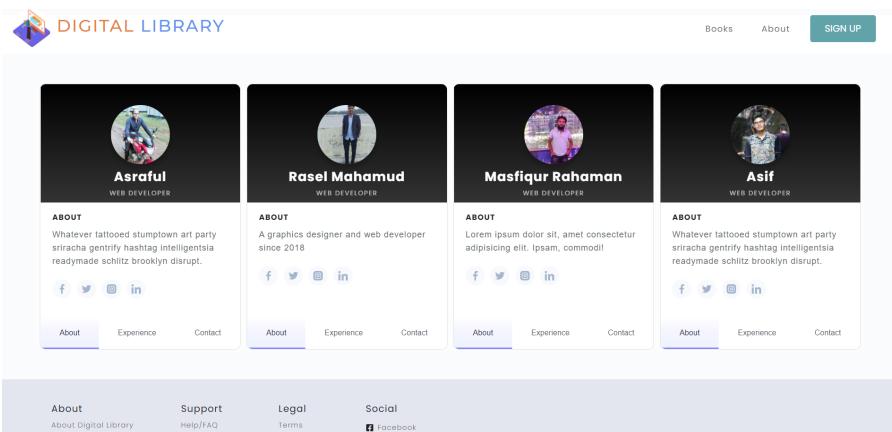


Figure 4.14: Team Info

This page contains all the information regarding our team .Here we can see our social media links and also the experience that we have.

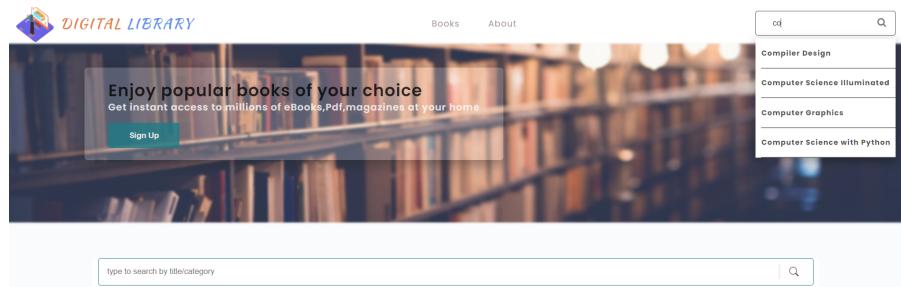


Figure 4.15: Search

The search feature shows corresponding values upon search. From here admin can login to

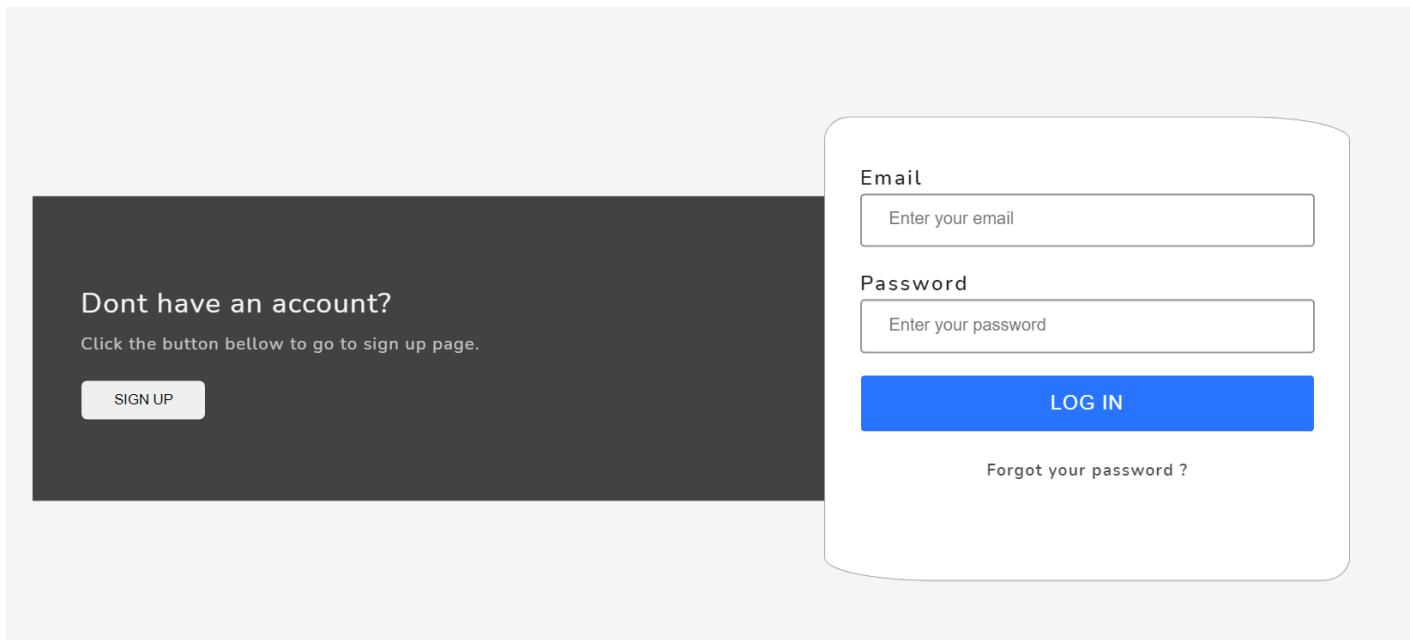


Figure 4.16: Admin Login

that database or click on the sign up button to register.

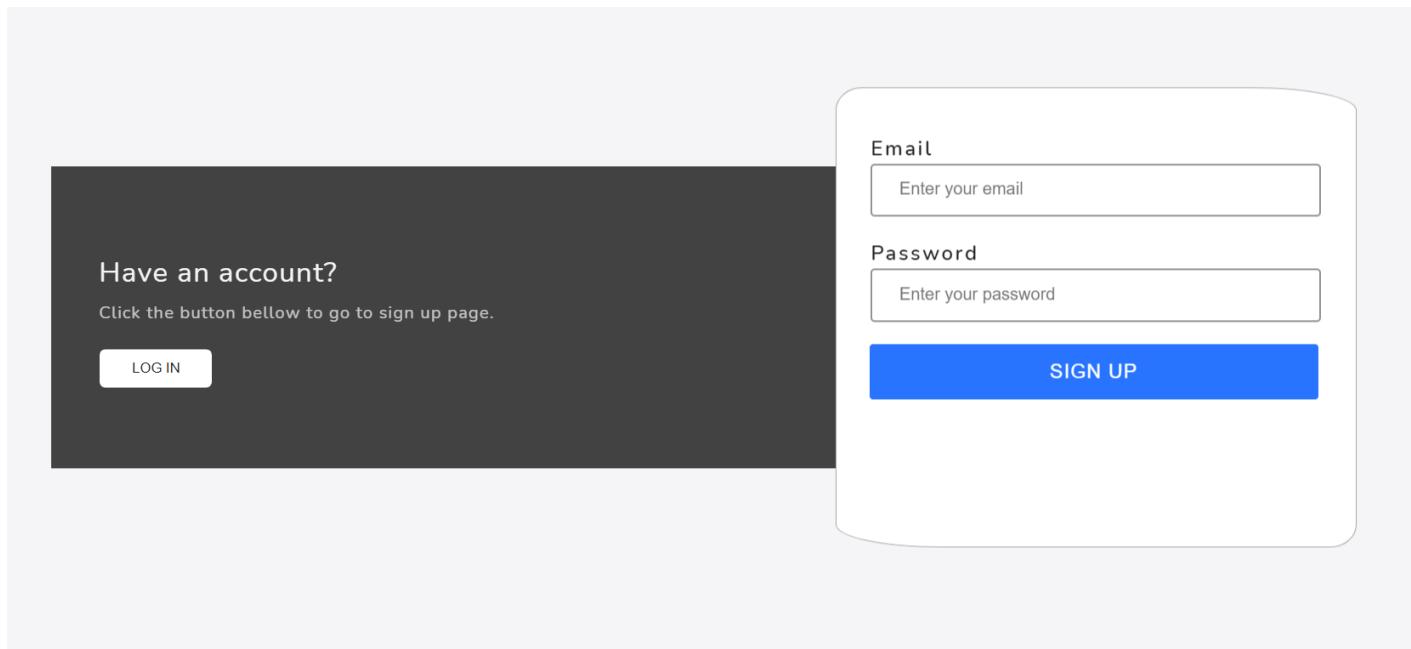


Figure 4.17: Admin Sign up

Only admin/Liberian can use this page. Normal user cant access this page and this is a protected route.

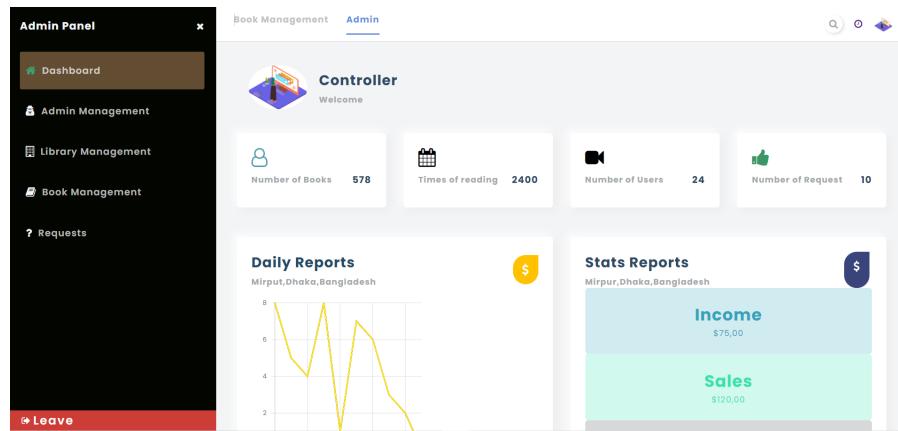


Figure 4.18: Dashboard

Protected route allows this page to be secure and this is the main panel of our admin panel. From here we can see the number of books and so on.

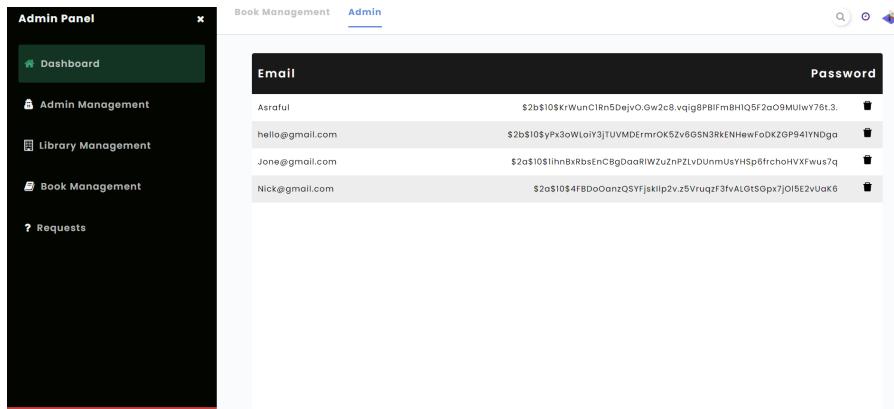


Figure 4.19: Librarian Management

Here we can see all the users currently registered in our database. Admin can delete any user from the database. User can edit or delete any books from the database .The books will

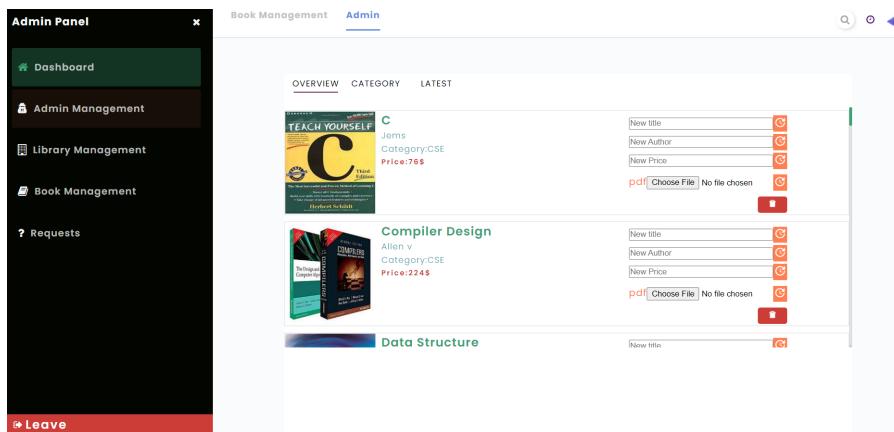


Figure 4.20: Book Management

be automatically updated .

Chapter 5

IMPLEMENTATION AND TESTING

5.1 Introduction

Programming is writing code to solve problems. Software Engineering is the practice of using a structured process to solve problems. As engineers, we want to have a codebase we can change, extend, and refactor as required. Tests ensure our program works as intended and that changes to the codebase do not break existing functionality.

5.2 Download

Upon clicking the download button user can download the PDF related to that book.

Test Case	Excepted Result	Test Result
On click Download button	Download the PDF of that specific book	successful

5.3 Search

Upon clicking the search box user can search through all the books currently present in the database. The search feature is coded in a way so that upon clicking any word ,all the books related to the search result will appear bellow and user can pick and chose which book they want to download.

Test Case	Excepted Result	Test Result
On entering any word	Search through the database and show all the search related result in front-end	successful
Upon clicking any resulted book	Go to the destined page of the book chosen and clear the data of the search box	successful
Protected Route	Normal user cannot access dashboard page ,if they tries then redirect them back to the admin login page	successful

5.4 Admin Control Panel

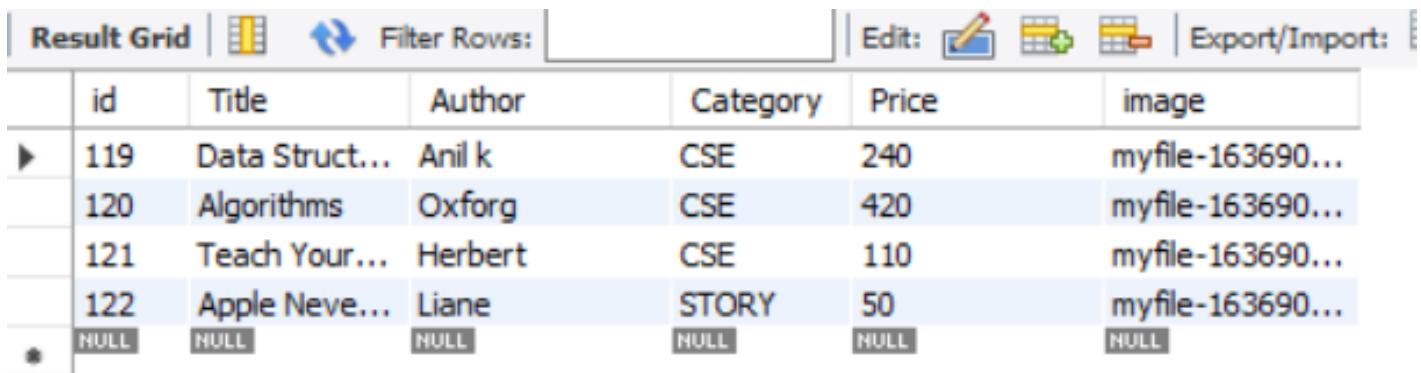
In the admin control panel we used a protected route that enables us to get a secured dashboard system. Using the protected route system normal user will not be able to access the admin panel only admin or Liberian after registering can enter this page.[6]

Here we performed some test :-

Test Case	Excepted Result	Test Result
On click of sign in button	At first user have to fill all the proper data,if any error like entering data then show error massage and if not then go to admin panel	successful
On Click of Register button	After filling proper data user will be added to the database and if not then show error message	successful
Protected Route	Normal user cannot access dashboard page ,if they tries then redirect them back to the admin login page	successful

5.5 Database

5.5.1 Books Database

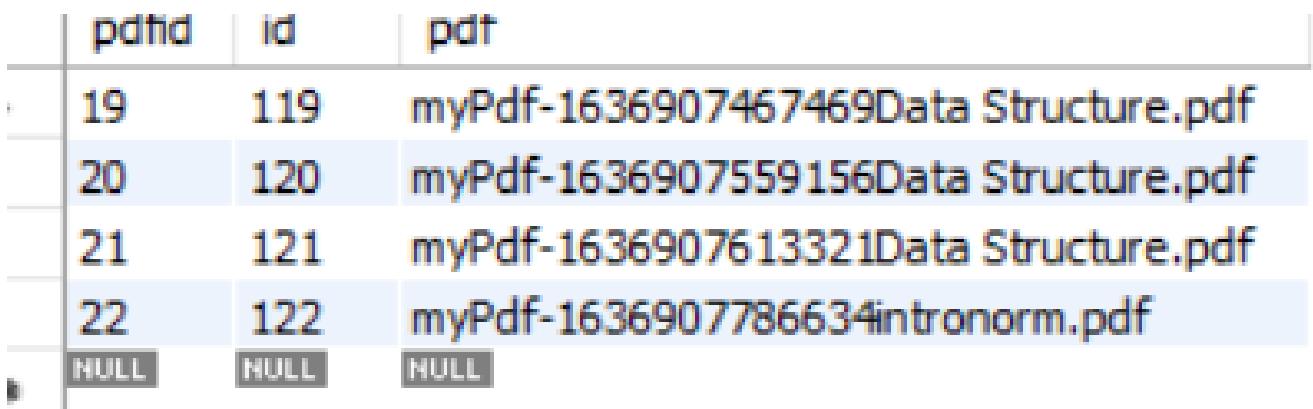


	id	Title	Author	Category	Price	image
▶	119	Data Struct...	Anil k	CSE	240	myfile-163690...
	120	Algorithms	Oxford	CSE	420	myfile-163690...
	121	Teach Your...	Herbert	CSE	110	myfile-163690...
*	122	Apple Neve...	Liane	STORY	50	myfile-163690...
	NULL	NULL	NULL	NULL	NULL	NULL

Figure 5.1: Book Database

The database above deals with all the stored books in our website. Here each book has its own title, author name, price with an image and dedicated pdf. User can easily download pdf of individual book.

5.5.2 Pdf Database



	pdfid	id	pdf
▶	19	119	myPdf-1636907467469Data Structure.pdf
	20	120	myPdf-1636907559156Data Structure.pdf
	21	121	myPdf-1636907613321Data Structure.pdf
	22	122	myPdf-1636907786634intronorm.pdf
	NULL	NULL	NULL

Figure 5.2: Pdf Database

This database deals with PDF only and it has a id as foreign key that is responsible for linking the PDF database with book database to get the accurate result.

	id	email	password
	25	hello@gmail.com	\$2b\$10\$yPx3oWLoiY3jTUVMDErmrOK5Zv6GSN3...
	28	Jone@gmail.com	\$2a\$10\$1ihnBxRbsEnCBgDaaRlWZuZnPZLvDUn...
	29	Nick@gmail.com	\$2a\$10\$4FBDoOanzQSYFjskIlp2v.z5VruqzF3fv...
	30	Alic@gmail.com	\$2a\$10\$iuQ01RPKKFAnl.puSXTDnuZjVeVQswB9...
▶	32	Asrful1@gmail.com	\$2a\$10\$4SO6C8NPpoGZ67wVsrlL4./wCoF3VVZ...
*	HULL	HULL	HULL

Figure 5.3: Admin Database

5.5.3 Admin Database

This database contains information of all the admin and Liberian currently registered in our system. Each person has their own email and password that is encrypted so that no third party user can hack into our system.

5.5.4 User Database

	id	email	password
▶	17	Asraful	\$2a\$10\$rzHWdk0PwZqVG98SyLHfQOk8oLSSlzx...
	18	Asif	\$2a\$10\$VP39KNEo.2i6oM87b/nYMOmrW6N9vG...
	19	Rasel	\$2a\$10\$ODgxRG.Stl7Xo2rAbXp3ieoD1yjHqwdY...
	20	Masfiq	\$2a\$10\$hEHOHim6M2Isqb9T/INHueiDNtq/9XRL...
*	HULL	HULL	HULL

Figure 5.4: User Database

This database contains information of all the user currently registered in our system. Normal user will not be able to use admin panel.

5.6 Testing And Analysis

5.6.1 Unit Testing

Unit testing is undertaken when a module has been created and successfully reviewed .In order to test a single module we need to provide a complete environment besides the module we would require-

- The procedures belonging to other modules that the module under test calls
- Non local data structures that module accesses
- A procedure to call the functions of the module under test with appropriate parameters

1. Test For the admin module

- Testing admin login form-This form is used for log in of administrator of the system.In this we enter the username and password if both are correct administration page will open other wise if any of data is wrong it will get redirected back to the login page and again ask for username and password.
- Student account addition- In this section the admin can verify student details from student academic info and then only add student details to main library database it contains add and delete buttons if user click add button data will be added to student database and if he clicks delete button the student data will be deleted.
- Book Addition- Admin can enter details of book and can add the details to the main book table also he can view the books requests .
- User Management: Admin can delete user information.

2. Test for User login module

- Test for user login from is used for log in of normal user .In this we enter users email and password if all these are correct login page will open other wise if any of data is wrong it will get redirected back to the login page and again ask for email and password.

- Test for account creation- This form is used for new account creation when user does not fill the form completely it asks again to fill the whole form when he fill the form fully it gets redirected to page which show waiting for conformation message as his data will be only added by administrator after verification.

3. Test for teacher login module-

Test for Admin login form- This form is used for log in of admin .In this we enter the email and password if all these are correct teacher login page will open other wise if any of data is wrong it will get redirected back to the login page and again ask for user and password.

5.6.2 INTEGRATION TESTING

In this type of testing we test various integration of the project module by providing the input .The primary objective is to test the module interfaces in order to ensure that no errors are occurring when one module invokes the other module.

Login form

Test Case	Excepted Result	Test Result
Enter valid email and password and click on login button	Software should display dashboard window	successful
Enter invalid	software should not display dashboard window	successful

Book Entry Form

Test Case	Excepted Result	Test Result
On click of add button	At first user have to fill all the proper data,if any error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise adds record to the database	successful
On Click of Delete Button	This deletes the details of book by using Accession no.	successful
On The click of Update Button	Modified records are updated in database by clicking update button.	successful
On click of SEARCH button	Display the details of book for entered Accession no. Otherwise gives proper Error message	successful
On the click of NEXT button	Display the next form	successful
On the click of DOWNLOAD button	Download the pdf for the Accession no.	successful

User Account Form:

Test Case	Excepted Result	Test Result
On the click of Add button	At first user have to fill all the proper data,if any error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise adds record to the database	successful
On the click of Delete Button	This deletes the details of users by using Register no.	successful
On the click of Update Button	This Modified records are updated in database by clicking update button	successful

Feedback Form:

Test Case	Excepted Result	Test Result
On the click of Submit button	At first user have to fill all the proper data,if any error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise adds record to the database	successful

5.6.3 System Testing

Below we have listed types of system testing :-

- Usability Testing – mainly focuses on the user's ease to use the application, flexibility in handling controls and ability of the system to meet its objectives
- is necessary to know that a software solution will perform under real-life loads.
- Regression Testing – involves testing done to make sure none of the changes made over the course of the development process have caused new bugs. It also makes sure no old bugs appear from the addition of new software modules over time
- Recovery testing – is done to demonstrate a software solution is reliable, trustworthy and can successfully recoup from possible crashes
- Migration testing – is done to ensure that the software can be moved from older system infrastructures to current system infrastructures without any issues.
- Functional Testing – Also known as functional completeness testing, Functional Testing involves trying to think of any possible missing functions. Testers might make a list of additional functionalities that a product could have to improve it during functional testing.

- Hardware/Software Testing – IBM refers to Hardware/Software testing as “HW/SW Testing”. This is when the tester focuses his/her attention on the interactions between the hardware and software during system testing.

Test Case Id	Test name	Description	Expected Result	Actual Result	Result
TC ₁	Book Modify	Admin clicks the update button in the admin panel to update book information	Upon clicking the update icon on the admin panel , Books info will be modified to the database and modified data will filter and show the new data.	Data is successfully modified in the database .But admin needs to manually go to another page or refresh the page to see the updated data.	successful

5.6.4 Acceptance Testing

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment[1]. UAT is done in the final phase of testing after functional, integration and system testing is done. The main Purpose of UAT is to validate end to end business flow. It does not focus on cosmetic errors, spelling mistakes or system testing. Following are the User Acceptance testing for our project:

Analysis of Business Requirements

- Project Charter
- Use Cases
- Process Flow Diagrams
- Business Requirements Documents

- System Requirements Specification

Project Charter:

Project Name:"Digital Library"

Project Description: A web based library system where user can download PDF and basic crud operation capability.

Project Deliverance's:

- Landing page for user sign ups
- PDF download option
- Basic crud operation
- Dashboard

Project Benefits:

- Boosted reputation
- Lead generation
- Resource we can continue to promote.

Project Milestones:

Landing page launched: 9 September,2021

Slides completed:26 November,2021

5.6.5 use case

Use Case ID	UC-01
Use Case	Download
Description	The users go to Digital Library.com .After that they can download PDF of the book they chose by clicking on Download button.
Including Use Cases	IUC-blank
Pre-conditions	Users opens up the Digital Library by typing Digital Library.com
Flow of Events	<ul style="list-style-type: none"> • User logs into the system. • Click the Download button • The PDF of that specific book will be shown as a pop up and after clicking the download button user will be able to download that PDF.

Use Case ID	UC-02
Use Case	Sign IN
Description	The admin/librarian types in the url-"/admin".After that they can go to the admin panel by clicking on the log in button.
Including Use Cases	IUC-blank
Pre-conditions	Admin opens up the Digital Library by typing in the correct url .
Flow of Events	<ul style="list-style-type: none"> ● .admin types in the correct url . ● Register if they don't have any account. ● Log in by giving the correct email and password. ● Click the log in button and go to the admin panel.

Chapter 6

USER MANUAL

6.1 Introduction

The User Manual contains all essential information for the user to make full use of the information system. This manual includes a description of the system functions and capabilities, contingencies and alternate modes of operation, and step-by-step procedures for system access and use. Use graphics where possible iii this manual. The manual format may be altered if another format is more suitable for the particular project.

6.2 Home page

The home page contains a overview of the system such as in our case we have a category hover button that shows all the book category information and by clicking any category button user will be sent to that related category page.

This page also contains a slideshow that shows some valuable information and we also have Navbar width a sign up and sign in button.Upon clicking the sign in button a sign in form will pop up.User can sign up using that login page and their information will be saved in the database .

Then we have a overview icon component that is responsible for showing some important icon that describes our work to the user.

Lastly,We have the footer.Here lies some social media link and more information regarding our

website.

6.3 Login

Authentication is important for almost all website .In this case, the login form our website provides has clean UI/UX as well as cool animation and most importantly encryption and decryption system that is responsible for security.

We have two login form page :-One for "Admin/Librarian" and the other one for normal user. Normal user can not access the login page for Admin.

6.4 Download Option

The most important feature of our website is the download option. We have PDF of every book available in our database.User can download the books PDF of their desire and with just a click of a button.This part was the most challenging part of this project.

6.5 Search

Search feature is a must if we want to get any information from the database with ease. We have a search feature that can get information from the database .Our search feature can search based on Title or category and it gets information in real time.

6.6 Feedback

Feedback system plays a vital role in getting any thoughts from the users that they may have. The business owner or admin can get daily feedback from the user and improve the services they provide.

Chapter 7

Conclusion and Future Work

7.1 Conclusions

After we have completed the project we are sure the problems in the existing system would overcome. The “DIGITAL LIBRARY” process made computerized to reduce human errors and to increase the efficiency. The main focus of this project is to lessen human efforts. The maintenance of the records is made efficient, as all the records are stored in the ACCESS database, through which data can be retrieved easily. The navigation control is provided in all the forms to navigate through the large amount of records. If the numbers of records are very large then user has to just type in the search string and user gets the results immediately. The editing is also made simpler. The user has to just type in the required field and press the update button to update the desired field. The Books and User are given a particular unique id no. So that they can be accessed correctly and without errors. Our main aim of the project is to get the correct information about a particular student and books available in the library. The problems, which existed in the earlier system, have been removed to a large extent. And it is expected that this project will go a long way in satisfying users requirements. The computerization of the Digital Library will not only improves the efficiency but will also reduce human stress thereby indirectly improving human resources.

- **Project Management Issues:** During the development process of Digital Library, there are a lot issues encountered. Firstly, we don’t have much knowledge about how online library process the book transaction and the business logic in the library. Thus,

a lot research has been done to refer and to get more understanding about the library management.

For the coding part, we meet some encountered some problems like adding PDF and image in same database. That is because our system couldn't distinguish PDF and image in same database.

Besides the PDF and IMG issue, we have met some problem regarding the member id generator module. In that module, we need to print out the member details such as name, id and also photo. In this case, we never learn how to print the detail in A4 size paper. With the help of Google and my friend, finally we know the method to use is Drawstring and Draw Image. On the other hand, we met problem of connecting with database,With the help our teacher we solved that

- **Reduce Time and Complexity :** We need to improve the data passing time and data processing capacity. So that we can improve the processing capacity and most importantly the security using our system
- **Lack of Resources:** .The main lacking In our Project was our experience . after gathering all information and required Knowledge we hope to make our project one of the best Library management system in the world.

7.1.1 FUTURE WORK

We are currently in the design phase of a large Digital Library project and are evaluating different systems to implement a portal at Graze. some of our Up coming Features are:

- **Online Payment System**
- **User Can view PDF before download**
- **Website will have google maps feature**
- **Website Will Be more optimized and Smooth**

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